Systematic review of effectiveness of smokeless tobacco interventions for South Asians and a review of contextual factors relating to smokeless tobacco among South Asian users and health care providers

Update information

November 2021: NICE guideline PH26 (June 2010) has been updated and replaced by NG209.

This guideline contains the evidence and committee discussion for recommendations from PH26 dated [2010] and [2010, amended 2021].

See www.nice.org.uk/guidance/NG209 for all the current recommendations and the evidence behind them.

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About the ScHARR Public Health Collaborating Centre

The School of Health and Related Research (ScHARR), in the Faculty of Medicine, Dentistry and Health, University of Sheffield, is a multidisciplinary research-led academic department with established strengths in health technology assessment, health services research, public health, medical statistics, information science, health economics, operational research and mathematical modelling, and qualitative research methods. It has close links with the NHS locally and nationally and an extensive programme of undergraduate and postgraduate teaching, with a Masters in public health, health services research, health economics and decision modelling.

ScHARR is a Public Health Collaborating Centre for the Centre for Public Health Excellence (CPHE) in the National Institute for Health and Clinical Excellence (NICE) established in May 2008. The Public Health Collaborating Centres work closely with colleagues in the Centre for Public Health Excellence to produce evidence reviews, economic appraisals, systematic reviews and other evidence based products to support the development of guidance by the public health advisory committees of NICE (the Public Health Interventions Advisory Committee (PHIAC) and Programme Development Groups).

Contribution of Authors

Josie Messina was the systematic review lead and Crystal Freeman was a reviewer on the project. Angie Rees developed and undertook literature searches. Ben van Hout was lead modeller. Elizabeth Goyder and Silvia Hummel were the senior leads.

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Glossary of Terms

Areca Nut: is a seed of the areca catechu tree and 'the fibrous pericarp of the fruit is removed and the seed or the endosperm used for chewing. These may be consumed fresh, dry, boiled, fermented or roasted' (Bedi 1996).

Betel Leaf aka paan or betel quid (added tobacco): is the leaf of a vine belonging to the Piperaceae family, which includes pepper and Kava. ''The leaf is mostly chewed but the stem or the inflorescence of Piper betle may also be consumed. The leaf is folded into a funnel shape and all other ingredients are added into it, resulting in a quid' (Bedi 1996). It is valued both as a mild stimulant and for its medicinal properties.

Nicotine replacement therapy (NRT): a pharmacological tobacco cessation aid which supplies nicotine to the blood stream thereby aiding in nicotine cravings (SCENIHR 2008)

Organisation for Economic Co-operation and Development (OECD): An organisation dedicated to global development with a membership of 34 countries: Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan Korea, Luxembourg, Mexico, Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic Slovenia, Spain, Sweden, Switzerland, Turkey, United Kingdom, United States

Smokeless tobacco: any product containing tobacco that is placed in the mouth or nose and is not burned.

South Asians: someone of South Asian origin with ancestry, parentage or extraction from India, Pakistan, Bangladesh or Sri Lanka (NICE Scope).

List of Abbreviations:

NA: Not available
NR: Not reported
NRS: Non-randomised study
NRT: Nicotine replacement therapy
OECD: Organisation for Economic Co-operation and Development
OR: Odds ratio
RR: Risk ratio
RCT: Randomised control trial
SA: South Asians
ST: Smokeless Tobacco

Executive summary

Smokeless tobacco can be broadly classified into products that are chewed and those that are sucked and is associated with numerous negative health outcomes (SCENIHR 2008). Chewed products such as gutkha and pan masala are widely usedby the South Asian community in the UK (Wardle 2006)—with betel quid (with and without tobacco) identified as the most commonly used product among this population (NHS Health and Social Care Information Centre, Public Health Statistics 2005). The National Institute for Health and Clinical Excellence has been asked bythe Department of Health to develop guidance to help South Asians stop using smokeless tobacco.

Aims and objectives

The aim of this review is to systematically assess the evidence for effectiveness and cost effectiveness of interventions to help South Asians to stop using smokeless tobacco. This review will also explore the contextual factors that influence effectiveness of interventions; and explore reasons why South Asians use smokeless tobacco.

Methods

A search strategy was developed in consultation with the NICE team which included targeted database searches of published and grey literature sources on the effectiveness, cost effectiveness and associated contextual factors of smokeless tobacco interventions among South Asians.

The search identified 2968 references which were sifted by 2 reviewers who agreed on the inclusion of 29 studies—15 for the effectiveness review and 14 for the contextual review (namely India).

For the effectiveness review, randomised controlled trials examining smokeless tobacco prevention and usage among South Asians, as well as, non-randomised studies examining smokeless tobacco cessation interventions and process evaluations among South Asians have been included. Interventions focussed on the delivery of health education messages, behavioural support and pharmacotherapy in school-based, community-based and workplace education programmes. Outcomes

included in this review can be classed into 4 categories: tobacco use and intentions to use tobacco, psychosocial and mediating risk factor outcomes, social-environmental risk factor outcomes, and outcomes related to the process of intervention implementation.

For the contextual review, cross-sectional studies examining smokeless tobacco prevention and usage among South Asians, qualitative studies of views and use of smokeless tobacco in South Asians and reports and project briefs were included. Outcomes included: knowledge and attitudes in relation to smokeless tobacco use after use of a smokeless cessation service, factors that impact on the use of smokeless tobacco products of certain groups of users (sub-population analysis pending availability of data) and clinician awareness of smokeless tobacco prevalence.

Quality assessments were verified by 2 reviewers, completed in consultation with the NICE team, and ratings based on the latest NICE methods manual (2009). A narrative analysis was undertaken to compile evidence for the effectiveness of interventions and contextual understanding of smokeless tobacco use among South Asians.

Summary of included studies

Review 1: Interventions review

Question one of this review examines the effect of interventions designed to help South Asians to stop using smokeless tobacco. A total of fifteen papers were systematically selected from a database of 2968 records and have been included in this review. Twelve papers were identified from a formalised and systematic search strategy and the remaining three papers, which consisted of grey literature and unpublished studies, were provided by NICE and subject experts. Thirteen of the papers were quality assessed as reasonable quality [+], while two papers were rated as poor quality [-]. Eight of the fifteen included papers provided evidence related to two RCTs. Seven papers reported outcomes from one school-based intervention in India (Project MYTRI) and one paper provided evidence from a community-based RCT (Anti-Tobacco Community Education Program [ATCEP] study) also conducted in India. The remaining papers included in this review were classified as non- randomised studies (NRSs). Of these 7 papers, six of them reported findings fromthe Bangladeshi Stop Tobacco Project (BSTP) and one paper provided evidencefrom a workplace tobacco cessation programme in India—the World No Tobacco

Day cessation programme (WNTD). The number of participants included in this effectiveness review is 55 477, but this does not account for overlap between studies. The data collected from RCTs and NRS were synthesised using a narrative approach and complemented with summary tables of evidence.

The majority of the data is based on findings from two intervention programs which targeted children and adult South Asians living in India and the UK. Results indicate that effective interventions have been implemented in schools and other community settings. In school-based settings, the delivery of health education messages related to the harmful effects of tobacco were shown to be effective in changing knowledge, attitudes, beliefs and values associated with tobacco use and intentions to usetobacco. Intervention components (classroom curricula, school posters, parent postcards and peer-led health activism) had a consistent, positive effect on knowledge of health effects, reasons to use, reasons not to use, advocacy skills efficacy, and normative beliefs, and in turn, had a negative effect on tobacco chewingbehaviour and the outcomes related to the intention to use tobacco . Furthermore,the use of peer-leaders to deliver intervention messages was also showed to be associated with successful uptake of intervention messages and implementation. In community settings, the use of behavioural support, in the form of brief advice and encouragement was found to be useful in helping South Asians quit smokeless tobacco. The use of nicotine replacement therapy (NRT) alone and in combination with behavioural support was shown to increase the likelihood of successfully quitting smokeless tobacco. Participants who reported adverse events and withdrawal symptoms such as anxiety, irritability, restlessness, depression and craving were lesslikely to successfully quit using tobacco.

The use of media (printed and audio-visual), health education materials and other forms of interpersonal communication (one-to-one counselling, lectures, group discussions, onsite activities) was found to be a common component of effective interventions. However, there was limited data available which examined the effect of the use of various types of materials on intervention outcomes (e.g., quit rates).

No outcome data related to the effectiveness of interventions in other settings (i.e., workplace) were available for evaluation.

Review 2: Contextual review

Question two of this review examines contextual factors associated with smokeless tobacco use among South Asians, as well as health practitioner's views. Evidence was limited to papers from OECD countries to allow for comparability to UK populations; although, through the search process, only UK-based papers fulfilled criteria for inclusion. Fourteen papers were systematically selected from a databaseof 2968 records. Eleven papers were identified from a formalised and systematic search strategy, while the remaining three papers, which consisted of grey literature and unpublished studies, were provided by the NICE team and subject experts. Two reports were listed and 10 papers were quality assessed as reasonable quality [+], while two studies were rated as good quality [++]. The majority of studies utilised a cross-sectional survey design; however, two reports were included along with a qualitative paper and a geographical land survey. The majority of data in the report focused on responses from South Asian community members; however, data from dental and other health professionals was expressed in a few papers.

Results revealed that paan is popular among most South Asians, specifically Bangladeshi individuals within the UK, as it is rooted in South Asian cultural heritage. Chewing smokeless tobacco is traditionally and culturally more appropriate for the female gender among South Asian communities, although males are users of smokeless tobacco. The use of smokeless tobacco products was more prevalent among older participants who may started chewing in India and also the UK; however, younger UK born South Asians are being drawn into the habit. The age of first use was varied, and some started chewing habits among their families as a pre- teen. Reasons for chewing ranged from using products in times of stress or boredom or simply to relax and ease tension. Traditional health messages and prior held beliefabout the health benefits may confuse users and lead them to chew for health reasons. Evidence suggested participants had very little understanding of the effects of paan chewing on their health, but some were aware of the health risks. There was a desire to quit; however, many found it difficult to go without tobacco. In terms of accessibility, smokeless tobacco products were widely available within communities, and many products did not comply with current regulations. Views of dental health professions revealed dentists often neglect to provide cessation support, and they would like more assistance and resources to help with this task. Finally, health information should be specifically targeted at South Asians by using culturally appropriate media.

Discussion

A major limitation of question one is the limited availability of evidence in regards to smokeless tobacco interventions targeted at South Asians. Trials conducted in India have limited applicability to the UK. The Tower Hamlets studies by Croucher et al were relevant to the populations within the UK since they were conducted within areas that are largely populated by South Asians, but RCTs are needed in these communities. Within question two, there was limited evidence to address the reasons'why' South Asians use smokeless tobacco since there was a focus on cross- sectional surveys which did not provided in-depth information into the social and cultural reasons why South Asians use smokeless tobacco. Another limitation of this review was the lack of cost effectiveness evidence.

Evidence statements

Question 1 Effectiveness interventions review

Overview of evidence identified

The effectiveness of intervention programmes in the cessation of smokeless tobacco use among South Asians was examined. The following is a synthesis of findings from the included studies. Evidence from fifteen studies will be presented. However, since only four interventions where identified, it needs to be acknowledged that there is a fair amount of overlap in reported findings. Thus, the studies are grouped by intervention programme: The Anti-Tobacco Community Education Program (ATCEP), The Bangladeshi Stop Tobacco Project (BSTP), Project MYTRI and The World No Tobacco Day cessation programme (WNTD). The ATCEP and Project MYTRI are randomised controlled trials. The ATCEP is a community-based trial and Project MYTRI is a school-based trial. The BSTP and The WNTD programme are non- randomised studies. The BSTP is a community-based programme and the WNTD isa workplace programme.

What types of interventions (behavioural, educational and/or pharmacological) are most effective and cost effective for cessation of smokeless tobacco use in South Asian populations worldwide and in the UK? Do they have any adverse effects?

Interventions providing behavioural support or counselling for individuals or groups—The BSTP and The WNTD:

Evidence statement 1: Behavioural support or counselling for individuals or groups: Tobacco use—Daily paan chewing and Prevalence of self-reported tobacco use

There was an insufficient amount of evidence that shows interventions which provide behavioural support or counseling for individuals or groups can reduce daily paan chewing among South Asians. There was no evidence that shows interventions which provide behavioural support or counseling for individuals or groups can reduce the prevalence of self-reported tobacco use among South Asians.

Evidence statement 2: Behavioural support or counselling for individuals or groups: Quit success—Behavioural support alone

A.) Brief advice and encouragement

There was moderate evidence from one UK quasi-experimental study (Croucher et al. 2003a [+] that brief advice and encouragement can have a positive effect on quitting tobacco among South Asians. Findings from the Croucher et al. (2003a [+]) showed that of those who completed the four-week BSTP cessation program and reported successfully quitting tobacco, 17% used brief advice and encouragement without NRT as their method of cessation. This evidence is applicable to a UK settingas this study was conducted in the UK.

B.) Focus group discussions

There was weak evidence from one Indian interventional cohort study (Mishra et al. 2009 [-]) that focus group discussion sessions had a positive effect on self reported quit rates in South Asians. Quit rates following the first, second, third, fourth, fifth and sixth focus group sessions of the WNTD programme were 30%, 44%, 48%, 46%, 46% and 48% respectively—with an overall quit rate of 40% at the end of the study.

This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 3: Behavioural support or counselling for individuals or groups: Quit success—Behavioural support and pharmacotherapy

There was moderate evidence from one UK quasi-experimental study (Croucher et al. 2003a [+]), one UK retrospective review of client records (Croucher et al. 2011c [+]) and one Indian interventional cohort study (Mishra et al. 2009 [-]) that behavioural support and pharmacotherapy in combination can have a positive effect on stopping tobacco use among South Asians. Croucher et al. (2011c [+]) found that use of NRT with behavioural support was an independent predictor of a successful cessation attempt (OR=5.38, 95% CI 2.71, 10.70), while Croucher et al. (2003a [+]) found that at the end of the four-week BSTP cessation programme, 19.5% of completers had stopped tobacco use—of which 22% had received NRT in addition to behavioural support. Furthermore, BSTP clients who chose the addition of NRT made a significantly greater reduction in their salivary cotinine scores at final review compared to baseline.

Five tobacco users from the WNTD programme were offered pharmacotherapy. One employee quit tobacco while two employees did not comply with the pharmacotherapy because of side effects following the use of Bupropion. The overall quit rate amongst the pharmacotherapy and behavioural support group was 20% (Mishra et al. 2009 [+]).This evidence is partially applicable to UK settings and to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 4: Behavioural support or counselling for individuals or groups: Quit success—Gender

There is contradictory evidence from one UK pilot study (Croucher et al. (2011b [+]) and one UK progress review study (Croucher et al. (2011a [-]) that gender can have a positive effect on stopping tobacco use among South Asians. Interim results from Croucher et al. (2011a [-]) reported that among BSTP clients, women were more likely than men to make a successful quit attempt. In contrast, Croucher et al. 2011b [+] no association between gender and quit success. Although, it was reported that

male clients were more likely to have received combination NRT (i.e. more than one form of NRT). This evidence is applicable to a UK setting as these studies were conducted in the UK.

Evidence statement 5: Behavioural support or counselling for individuals or groups: Quit success—Adverse events and withdrawal symptoms

There is moderate evidence from one UK quasi-experimental (Croucher et al. (2003a [+]), one UK pilot study Croucher et al. 2011b [+]), one UK progress review study (Croucher et al. 2011a [-]) and one Indian interventional cohort study (Mishra et al. 2009 [-]) that adverse events and withdrawal symptoms can affect quit success among South Asians. Interim results from Croucher et al. (2011a [-]) reported that BSTP clients who experienced a lower mean number of withdrawal symptoms or lower mean number of adverse events at first follow-up at 2 weeks were more likelyto make a successful quit attempt. Croucher et al. 2011b [+] found that BSTP clients with fewer withdrawal symptoms at first follow-up was significantly associated with a successful quit attempt (p=0.005). Fewer NRT-related adverse events at first follow- up were also significantly associated with a successful quit attempt (p=0.028) whilst those reporting oral pain and discomfort at first follow-up were less likely to make a successful quit attempt (p=0.034). Croucher et al. (2003a [+]) found that oral painwas reported as a barrier to successful oral tobacco cessation by 62% of the volunteers at final review. Employees in the WNTD programme who relapsed after initial quitting stated physical discomfort like constipation as a reason for relapse and not achieving successful cessation (Mishra et al. 2009 [-]).This evidence is partially applicable to UK settings and to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 6: Behavioural support or counselling for individuals or groups: Psychosocial factors

There is weak evidence from one Indian interventional cohort study (Mishra et al. 2009 [-]) that shows interventions which provide behavioural support or counsellingfor individuals or groups can have a positive effect on knowledge related to the harmful effects of tobacco. Mishra et al. (2009 [-]) found there was considerable improvement in the knowledge, attitudes and practices related to tobacco use among WNTD participants post-intervention. A comparison of pre- and post-intervention found increases in knowledge regarding harmful forms of tobacco (43.3% vs. 85.0%),

cigarette safety (54.8% vs. 85.0%), risk for heart attack (47.2% vs. 67.0%) and availability of professional cessation services (75.0% vs. 98.0%). This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 7: Behavioural support or counselling for individuals or groups: Quit success—Programme satisfaction

There is limited evidence from one UK pilot study (Croucher et al. 2011b [+]) and one Indian interventional cohort study (Mishra et al. [-]) that shows client satisfaction with intervention components can have a positive effect on stopping tobacco use among South Asians. Croucher et al. (2011b [+]) found that clients reported being either 'satisfied' (36.5%) or 'very satisfied' (63.5%) with the support they had received for their quit attempt and that 97% would recommend the service to other smokeless tobacco users. Nearly all BSTP clients (97%) reported that they would return to the service for any future quit attempt. Clients were more likely 'very' satisfied male (p=0.035) and if they reported below the mean number of adverse events compared to other clients in the second week of follow-up (p=0.016). The majority of the employees in the WNTD programme appreciated the program and believed that ithad helped them to bridge the gap between their thoughts and behaviour and motivated them to stop tobacco use (Mishra et al. 2009 [-]). This evidence is partially applicable to UK settings and to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 8: Behavioural support or counselling for individuals or groups: Quit success—Uptake of programme components

There is moderate evidence from one Indian interventional cohort study (Mishra et al. 2009 [-]) that shows the uptake of behavioural support can have a positive effect on stopping tobacco use in South Asians. For the WNTD programme, tobacco users were offered behavioural therapy in the form of focus group discussion (FGD) and one-to-one counselling from round two onwards. Among the 50 tobacco users invitedfor the FGD, 90% participated in the first session, 88% in the second session, 88% inthe third session, 66% in the fourth session, 90% in the fifth session, 84% in the sixth session and 86% in the seventh session. Quit rates following the first, second, third, fourth, fifth and sixth focus group sessions were 30%, 44%, 48%, 46%, 46% and 48% respectively—with an overall quit rate of 40% at the end of the study. This

evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Brief interventions (including brief advice) by health and social care professionals, including dental practitioners and GPs

Evidence statement 9: Brief interventions (including brief advice): Interventions delivered by health and social care professionals

There are no available data regarding the effect of brief interventions (including brief advice) by health and social care professionals on smokeless tobacco use among South Asians.

Brief interventions (including brief advice) by community members or peers—Project MYTRI

Evidence statement 10: Brief interventions (including brief advice) by community members or peers: Tobacco use—Prevalence of self-reported tobacco use

There is moderate evidence from two Indian RCTs (Perry et al. 2009 [+]; Stigler et al. 2007 [+]) that show interventions delivered by peers can have a positive effect on reducing tobacco use among South Asians. Perry et al. (2009 [+]) found that the rates of cigarette smoking and bidi smoking, as well as any tobacco use among students aged 10-16, increased over time in the control group, while the rate of tobacco use in the intervention group actually decreased over time. There were no significant between-group differences in the change in rate of chewing tobacco use ($p>0.10$) among students who participated in Project MYTRI. Tobacco use increased by 68% in the control group and decreased by 17% in the intervention group over the2 years. Stigler et al. (2007 [+]) reported no differences between intervention and control groups in baseline rates of tobacco use. After 1 year of implementation, no significant differences in actual tobacco use were observed. However, the prevalenceof tobacco use decreased in both conditions over time. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 11: Brief interventions (including brief advice) by community members or peers: Quit success

There are no available data regarding the effect of brief interventions delivered by community members or peers on quit success among South Asians.

Evidence statement 12: Brief interventions (including brief advice) by community members or peers: Adverse events and withdrawal symptoms

There are no available data regarding the effect of brief interventions delivered by community members or peers on adverse effects and withdrawal symptoms among South Asians

Evidence statement 13: Brief interventions (including brief advice) by community members or peers: Psychosocial factors—Knowledge, attitudesand beliefs

There is moderate evidence from two Indian RCTs (Perry et al. 2009 [+]; Stigler et al. 2011 [+]) that show brief interventions delivered by community members or peers can have a positive effect on knowledge, attitudes and beliefs among South Asians. Perry et al. (2009 [+]) found that there were significant differences between the intervention and control groups for Project MYTRI with respect to knowledge of the health effects of tobacco use, reasons to use and not use tobacco, perceived prevalence of chewing tobacco use, perceived prevalence of smoking, normative beliefs regarding tobacco use, advocacy skills self-efficacy, knowledge of tobacco-control policies, andsocial susceptibility to chewing tobacco use (all: $p<0.05$). Stigler et al. (2011 [+]) found that Project MYTRI had a consistent, positive effect on knowledge of health effects, reasons to use, reasons not to use, advocacy skills efficacy, normativebeliefs and beliefs about social consequences. This evidence is partially applicable topeople of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 14: Brief interventions (including brief advice) by community members or peers: Psychosocial factors—Intentions to use tobacco

There is mixed evidence from four Indian RCTs (Bate et al. 2009 [+]; Perry et al. 2009 [+]; Stigler et al. 2007 [+]); Stigler et al. 2011 [+]) that show brief interventions delivered by community members or peers can have a positive effect on intentions to use tobacco among South Asians. Results from Bate et al. (2009 [+]) indicated that the psychosocial risk factors Knowledge of Health Effects, Normative Beliefs, Reasons to Use Tobacco, and Perceived Prevalence were significant mediators between the intervention activities and students' tobacco use intentions. However, Beliefs about Social Consequences, Normative Expectations, Self-Efficacy in RefusalSkills, Support for Tobacco Control Policy, Social Susceptibility to Chewing and Social Susceptibility to Smoking where not affected by the intervention. For multiple mediator models, significant mediating psychosocial risk factors for intentions to chew included: Knowledge of Health Effects, Normative Beliefs, Reasons to Use Tobacco and Perceived Prevalence of Chewing.

Evidence of inconsistent mediation was observed for the Perceived Prevalence.Perry et al. (2009 [+]) found that there were significant differences in the rates of growth of students' intentions to chew tobacco ($p<0.03$) over time, with the intervention students decreasing their intentions more than the control group. Intentions to chew tobacco decreased by 12% in the control group and by 28% in the intervention group. Stigler et al. (2007 [+]) found that fewer students in the intervention condition reported having intentions to chew tobacco when they reached college ($p<0.01$). After only 1 year of implementation, students in the intervention condition had fewer intentions to chew tobacco as they reached college age ($p<0.01$). Marginally significant differences were noted in their intentions to smoke in college ($p=0.08$) or as an adult ($p=0.08$), as well as the intentions to chew tobacco asan adult ($p=0.07$).

Stigler et al. (2011 [+]) found that changes in normative beliefs had a consistent effect on intentions to use tobacco, accounting for 95% of the total intervention effect in multivariable models. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 15: Brief interventions (including brief advice) by community members or peers: Implementation—Training of teachers

There was limited evidence from one Indian cluster RCT (Goenka et al. 2010 [+]) that showed the training of teachers had a positive effect on implementation of intervention components and objectives and better intervention outcomes. Goenka etal. (2010 [+]) found that the proportion of teachers trained in a school correlated with better implementation of objectives ($r=0.58$, $p<0.02$) and superior peer leaders–student communications ($r=0.75$, $p<0.001$). It was also of greater benefit in lowering the susceptibility to chewing tobacco ($r=0.53$, $p<0.05$). Furthermore, the communication between students and peer leaders ($r=0.66$, $p<0.005$) and higher proportion of students participating in the classroom discussions ($r=0.70$, $p<0.005$) correlated with better outcomes. Schools with a higher proportion of teachers trained also had better communication between the students and peer leaders. This evidence is partially applicable to people of South Asian ancestry living in the UKwho may have maintained cultural and social practices related to smokeless tobacco use.

Local community-based initiatives to raise awareness of the harm caused by smokeless tobacco and to encourage the uptake of cessation services bypeople who use smokeless tobacco—The ATCEP study

Evidence statement 16: Local community-based initiatives to raise awareness: Tobacco use—Prevalence rates

There is moderate evidence from one study Indian RCT (Anantha et al. 1995 [+]) that showed tobacco education interventions which raise awareness about the harmful effects of tobacco can have a positive effect on prevalence rates of tobacco use among South Asians. Post-intervention, results from the ATCEP showed a decline in rates from baseline to final assessment at 3 years—with a 10.2% decrease for males in the experimental area compared to 2.1% and 0.5% decrease in the control areas ($p<0.0001$). For females, there was a 16.3% reduction in the experimental area compared to 2.9% and 0.6% in the control areas ($p<0.0001$). Post-intervention, there was a 5.6% reduction in the percentage of males who reported tobacco chewing compared to 1.2% and 0% reduction in the control areas ($p<0.0001$) (Anantha et al. 1995 [+]).This evidence is partially applicable to people of South Asian ancestry living

in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 17: Local community-based initiatives to raise awareness: Tobacco use—Initiation rates of tobacco use

There is mixed evidence from one Indian RCT (Anantha et al. 1995 [+]) that showed tobacco education interventions which raise awareness about the harmful effects of tobacco can have a positive effect on decreasing initiation rates of tobacco use among South Asians. Baseline initiation rates of tobacco use from the ATCEP showed that male rates were comparable between the experimental and control areas. However, the rate among females was different. Initiation rates of tobacco usein the experimental area showed a statistically significant decline in males ($p<0.01$) and females ($p=0.005$) between the baseline and the first follow-up surveys at 2 years. At the final 3 year assessment, males in the first control area did not show a statistically significant decline in the initiation rate ($p=0.16$). At the final 3 year assessment, the initiation rate of chewing among males was 0.2% and that of smoking 0.1% in the experimental area. In control area I, the initiation rate of chewingwas 0.1% compared with 0.3% for smoking. In control area II, the initiation rates were0.4% and 0.9% for chewing and smoking respectively. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 18: Local community-based initiatives to raise awareness: Tobacco use—Quit rates

There is mixed evidence from one Indian RCT (Anantha et al. 1995 [+]) that showed tobacco education interventions which raise awareness about the harmful effects of tobacco can have a positive effect on increasing quit rates of tobacco use among South Asians. Results from the ATCEP indicated that the numbers and rates of persons who had quit using tobacco at the time of first repeat survey at 2 years was much higher in the experimental area compared with the control areas (in males, 26.5% in the experimental area vs. 3.2% and 1.1% in control areas I and II, respectively; and in females, 40.7% in the experimental area vs. 2.4% and 0.2% in control areas I and II, respectively). By the end of follow-up at 3 years, results from the experimental area showed a decrease in quitters' by 4.0% in females and no change in the rate for males. The quit rate among male chewers also showed a

decrease over time as well—with the percentage of quitter declining from 32.0% to 30.2% between the first follow-up survey at 2 years and the final survey at 3 years. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 19: Local community-based initiatives to raise awareness: Tobacco use—Adverse events and withdrawal symptoms

There are no available data regarding the effect of adverse events and withdrawal symptoms on stopping tobacco use among South Asians.

Evidence statement 20: Local community-based initiatives to raise awareness: Tobacco use—Psychosocial factors

There are no available data regarding changes in psychosocial factors, such as knowledge, attitudes or beliefs and their effect on stopping tobacco use among South Asians.

Evidence statement 21: Local community-based initiatives to raise awareness: Implementation—Health education materials

There is limited evidence from one Indian RCT (Anantha et al. 1995 [+]) that showed implementation of health education materials can have an effect on stopping tobacco use among South Asians. Participants in the ATCEP study were exposed to one of three types of health communication methods (printed, audio-visual and inter- personal communication). There was no marked difference in the proportion of quitters exposed to reading material and inter-personal communication compared to the proportion non-quitters who were exposed to these materials. However, with regard to the audio-visual forms of education, during the first follow-up, 68.6% of quitters were exposed to the films on chewing and smoking compared with 57% of non-quitters. During the final assessment, 95.7% of quitters had viewed the films compared with 90% of non-quitters. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Interventions to raise awareness and knowledge among health and social care professionals about smokeless tobacco use

Evidence statement 22: Interventions to raise awareness and knowledge: Interventions for health professionals

There are no available data regarding brief interventions (including brief advice) to health and social care professionals and their effect on smokeless tobacco use among South Asians.

What external factors influence the effectiveness of the intervention (such as content, delivery, setting, who is delivering the intervention, intensity, duration and target setting)?

Evidence statement 23: External factors influencing the effectiveness of the intervention—Setting

There was no evidence that compares intervention effectiveness directly between settings, therefore it is not possible to determine whether a particular setting is better than any other in terms of outcomes.

Evidence statement 24: External factors influencing the effectiveness of the intervention—Content

There was no evidence that provides a direct comparison of intervention components and their effect on intervention outcomes. Therefore it is not possible to determine whether a particular intervention component or group of components is better than any other in terms of outcomes.

Evidence statement 25: External factors influencing the effectiveness of the intervention—Intensity

There was no evidence available regarding the level of intervention intensity and its effect on intervention outcomes.

Evidence statement 26: External factors influencing the effectiveness of the intervention—Duration

There was moderate evidence from one UK quasi-experimental study (Croucher et al. 2003a [+]), one UK progress review study (Croucher et al. 2011a [-]), one UK pilot study (Croucher et al. 2011b [+]), and one UK retrospective review of client records (Croucher et al. 2011c [+]) that brief interventions can have a positive effect on stopping tobacco use among South Asians. Croucher et al. (2003a [+]) found that 91% of volunteers completed the 4-week trial. Results showed that 19.5% of BSTP completers had stopped tobacco use, of which 22% had received NRT, and 17% received brief advice and encouragement without NRT. The successful members of the NRT group made a significantly greater reduction in their salivary cotinine scores at final review compared to baseline. Croucher et al. (2011a [-]) reported a 54% quit rate among the 229 BSTP clients who completed the four-week intervention programme. Croucher et al. (2011b [+]) showed that 94% of BSTP clients used NRT in their quit attempt. Sixty-two percent reported a successful quit attempt at four weeks. Croucher et al. 2011c [+] found that at the end of the four-week intervention, self-reported continuous tobacco abstinence was 58.3% among BSTP clients. This evidence is applicable to a UK setting as this study was carried out in the UK.

Evidence statement 27: Deliverers of intervention components

There is moderate evidence from one Indian cluster RCT (Goenka et al. 2010 [+]) that showed tobacco education interventions delivered by teachers and peers can have a positive effect on intervention outcomes. A process evaluation of Project MYTRI found that the proportion of teachers trained in a school correlated with better implementation of objectives ($r=0.58$, $p<0.02$) and superior peer leaders–student communications ($r=0.75$, $p<0.001$). It was also of greater benefit in lowering the susceptibility to chewing tobacco ($r=0.53$, $p<0.05$). Furthermore, the communication between students and peer leaders ($r=0.66$, $p<0.005$) and higher proportion of students participating in the classroom discussions ($r=0.70$, $p<0.005$) correlated with better outcomes. Schools with a higher proportion of teachers trained also had better communication between the students and peer leaders. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

What internal factors influence the effectiveness, of the intervention (such as age, socio-economic status, ethnicity, and attempts at cessation)?

Evidence statement 28: Internal factors influencing the effectiveness of the intervention—Age

There was no evidence providing a direct comparison of age and its effect onstopping tobacco use among South Asians. Therefore it is not possible to determine whether a particular age group is likely to be more successful at quitting tobacco thananother age group.

Evidence statement 29: Internal factors influencing the effectiveness of the intervention—Socio-economic status

There is moderate evidence from one UK retrospective review of client records (Croucher et al. 2011c [+]) that showed socio-economic can have an effect on quit rates among South Asians. BSTP participants who were living in relatively less economically deprived areas) were found to be significantly more likely to have made a successful cessation attempt at four weeks compared to those who lived in very

deprived areas (OR=1.98, 95% CI=1.17-3.32, p=.01). This evidence is applicable to a UK setting as this study was carried out in the UK.

Evidence statement 30: Internal factors influencing the effectiveness of the intervention—Ethnicity

There was a lack of evidence providing a direct comparison of ethnicity and its effect on stopping tobacco use among South Asians. Therefore it is not possible to determine whether a particular ethnic group is likely to be more successful at quitting tobacco than any other ethnic group.

Evidence statement 31: Internal factors influencing the effectiveness of the intervention—Attempts at cessation

There is limited evidence from one UK retrospective review of client records (Croucher et al. 2011c [+]) and one Indian interventional cohort study (Mishra et al. 2009 [-]) that the number of previous quit attempts can affect quit success. Croucher et al. (2011c [+]) reported that among BSTP clients who had ever attempted to quit tobacco in the past, 60.9% had successfully quit tobacco by the end of the four-week intervention and 39.1% were not successful. Forty-seven percent of the WNTDprogramme participants who quit tobacco, had attempted quitting in the past. Among the 20 employees who finally quit tobacco, 21% had attempted quitting tobacco once previously, 10% had attempted quitting twice previously, 10% had three previous attempts and one employee had attempted quitting seven times previously. Among the quitters, 53% had never attempted quitting in the past. However, after intense counselling by the tobacco control team they successfully quit tobacco (Mishra et al. 2009 [-]).This evidence is partially applicable to UK settings and to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Question 2: Contextual review

What opinions, attitudes, and cultural practices encourage or predispose South Asians to use smokeless tobacco?

Evidence statement 32: Characteristics of users

Moderate evidence from eight UK studies including two reports (HDA 2000 [+]; Rees 2007 [+]) and six cross sectional studies (Ahmed et al. 1997 [+]; Bedi & Gilthorpe 1995 [+]; Pearson et al 1999 [+]; Vora et al. 2000 [+]; Croucher et al 2002 [++]; Croucher et al. 2007 [++]) reported on how many respondents used smokeless tobacco. Eight percent of the South Asians in Leicester used smokeless tobacco products (Rees 2007 [+]).Thirty percent of Bangladeshi men within Tower Hamlets tobacco were users of smokeless tobacco (Croucher et al. 2007 [++]). Betel-quid washighest in Hindus from Leicester (21%) followed by 5% of Muslims and Jains (Vora etal. 2000 [+]). In a Bangladeshi sample from Tower Hamlets, 78% chewed paan, with 52% adding tobacco (Pearson et al. 1999 [+]). Half (49%) of female Bangladeshis from Tower Hamlets used smokeless tobacco (Croucher et al 2002 [++]). Betel quid chewing was over 80% with no gender difference, and tobacco was added to paanby more women (43% n=32) than men (29% n=19) (p.0.09) (Ahmed et al. 1997 [+]). In an East London study, 28% Bangladeshi adolescents sampled used betel quid, with 12% adding tobacco (Bedi & Gilthorpe 1995 [+]).

Evidence statement 33: Social acceptability

Moderate evidence from one UK qualitative study of reasonable quality set in Tower Hamlets (Croucher & Choudhury 2007 [+]), and two UK cross-sectional studies of reasonable quality set in Birmingham and Tower Hamlets (Ahmed et al. 1997 [+]; Bedi & Gilthorpe 1995 [+]) examined social acceptability of smokeless tobacco use among the genders and found smokeless tobacco is traditionally and culturally more appropriate for the female gender among South Asian communities. Females appeared to be more accepting of their own chewing habits, while men did not, and there was a general consensus that children should not be using betel quid (Ahmed et al. 1997 [+])

Evidence statement 34: Gendered use patterns

Contradictory evidence was found regarding gendered patterned use of smokeless tobacco in four UK cross-sectional studies (Bedi & Gilthorpe 1995 [+]; Pearson et al.

1999 [+]; Prabhu et al. (2001 [+]; Summers et al. 1994 [+]). In a Birmingham study there were similar levels of betel quid use for Bangladeshi men (92%) and females (96%) (Bedi & Gilthorpe 1995 [+]). In a study by Prabhu et al. (2001 [+]) set in East London, similar betel quid use between genders in a Bangladeshi sample was noted. In contrast, more Bangladeshi women (81%) from Birmingham added tobacco to their quids than men (37%) (Bedi & Gilthorpe 1995 [+]). Furthermore, a greater proportion of Bangladeshi women within Tower Hamlets participants were chewing more than men, and females were more likely to add tobacco to their pans thanmales ($p< 0.01$) (Pearson et al. 1999 [+]). According to a Yorkshire study of first generation Bangladeshi women, paan was used by 95% (282/295) of women, and 62% (174/295) of paan users added leaf tobacco (Summers et al. 1994 [+]).

Evidence statement 35: Onset of use

One UK qualitative report (HDA 2000 [+]), and four UK cross-sectional studies investigated the age and location of onset of smokeless tobacco use (Ahmed et al. 1997 [+]; Pearson et al. 1999; [+]; Prabhu et al. 2001 [+]; Summers et al. 1994 [+]). Smokeless tobacco use was more prevalent among older South Asians; however, younger UK born South Asians are using smokeless tobacco products (HDA 2000 [+]. In a Tower Hamlets sample, 75% of smokeless tobacco users started in Bangladesh, but 25% of both sexes started chewing paan in London and were younger (average age 34 years) than those who started in Bangladesh (average age 44 years) (Ahmed et al. 1997 [+]). The mean age of onset of Bangladeshi users in Tower Hamlets was 20 years old (range 6-56). By 17 years 50% were chewing paan,with more males commencing chewing paan by 15 years of age than females ($p < 0.05$) (Pearson et al 1999 [+]). According to evidence by Prabhu et al. (2001 [+] set in East London, the median age of first chewing was as early as 9 years old with nearly most (86%) starting their chewing habits while living in London. In a Yorkshire study, 18% (51/295) were chewing by 10 years of age with a mean onset of 17 years (Summers et al. 1994 [+]).

Evidence statement 36: Predictors of use

Strong evidence from two UK cross-sectional studies (Croucher et al. 2002; [++]; Croucher et al. 2007 [++]), and moderate evidence from three UK cross-sectional studies examined predictors of smokeless tobacco use (Ahmed et al. 1997 [+];Prabhu et al. 2001 [+]; Summers et al. 1994 [+]). Bangladeshi women from Tower Hamlets who used smokeless tobacco were significantly older, had used ST for a longer period, and were more likely to cite habit as a reason for chewing, and were

also more like to have their first paan after waking (Croucher et al 2002 [++]). In a male Bangladeshi sample from Tower Hamlets, smokeless tobacco users were foundto be older, more likely to have had no formal education, rate their health as average or poor, have increased chronic illness episodes, report current oral pain, have the lowest social capital score, and a high proportion of chewers (83%) had a wife that also used smokeless tobacco (Croucher et al 2007 [++]). A Yorkshire study ofBangladeshi women found that participants who consumed more paans daily were significantly older, less literate, had fewer years of formal education, and were more likely to believe that smokeless tobacco was a beneficial habit (Summers et al. 1994 [+]). Paan use appeared to be more likely among South Asian females in Tower Hamlets than males who were lighter users ($p < 0.001$) (Ahmed et al. 1997 [+]). Bangladeshi youth from East London who used paan were more likely to think it tasted good, had parents with lower educational attainment, and express less negative attitudes to harmful effects of uses on dental appearance and health/ oral cancer (Prabhu et al. (2001 [+]).

Evidence statement 37: Reasons for chewing- social, traditional, habitual

Evidence from two UK reports (HDA 2000 [+]; Rees 2007 [+]), and four UK cross-sectional studies (Bedi & Gilthorpe 1995 [+]; Pearson et al. 1999 [+]; Summers et al. 1994 [+]; Croucher et al. 2002 [++]) suggest that South Asians of Bangladesh heritage within the UK use smokeless tobacco products for reasons relating to tradition and cultural heritage, as well as using smokeless tobacco as part of a habitual practice that has a deeply rooted social component. Evidence indicated that it is simply a habit and part of a daily routine (Croucher et al. 2002 [++]; Summers et al. 1994 [+]), and many peers used, although more males than females indicated they liked the taste of the products ($p<0.001$) (Bedi & Gilthorpe 1995 [+]). Habits could lead to addiction, and this was noted as a reason for chewing in 14% of a Bangladeshi sample in Tower Hamlets (Pearson et al. 1999 [+]).

Evidence statement 38: Reasons for chewing- mental and physical health

Evidence from two UK reports (HDA 2000 [+]; Rees 2007 [+]), and three UK cross-sectional studies (Pearson et al. 1999 [+]; Summers et al. 1994 [+]; Croucher et al. 2002 [++]) suggest that South Asians use paan to relieve stress, boredom, or relax (HDA 2000 [+]), although traditional Hindu messages suggested that paan aids digestion, freshens the breath and strengthens the heart (Rees 2007 [+]). Twenty-two percent of Bangladeshi women from Yorkshire found chewing paan pleasant and refreshing, while 12% believed chewing had positive health benefits or could aid in

digestion (11%), oral hygiene (20%), or help with pain (6%), as well as serve to make lips more attractive (Summers et al. 1994 [+]). Evidence suggested that Bangladeshi women sampled within Tower Hamlets believed paan was good for their teeth (22.3%, 23/103), and 12.6% (13/103) found it refreshing (Croucher et al. (2002 [++]), Evidence, also from a Tower Hamlets sample, confirms perceptions of paan being useful for dental pain management, a digestion and refreshment aid (Pearson et al. 1999 [+]).

Evidence statement 39: Knowledge of health risks

Moderate evidence from two UK reports (HDA 2000 [+]; Rees 2007 [+]), and five UK cross-sectional studies (Ahmed et al. 1997 [+]; Pearson et al. 1999 [+]; Summers et al. 1994 [+]; Vora et al. 2000 [+]; Croucher et al. 2002 [++]) investigated knowledge of health risks of smokeless tobacco use. South Asian focus group participants hadvery little understanding of paan health risk, due to cultural traditions overshadowing thoughts of risks, and participants (especially older Bangladeshis) believed paan had little effect on health, but some dental concerns were noted (HDA 2000 [+]). Paan was believed to be helpful in masking oral pain, aiding in oral hygiene, thus resulting in people not visiting a dentist for oral symptoms (Rees 2007 [+]). Strong evidence suggests 10.8% (10/93) of Bangladeshi respondents from Tower Hamlets believed chewing was good for your health, and 89% (83/93) believed it was bad for health (Croucher et al 2002 [++]). Also, 62% of first generation Bangladeshi women from Yorkshire thought chewing was good for their health, 20% believed it was negativefor health, 13% neither good nor bad, and 5% did not know (Summers et al. 1994[+]). According to research set within Tower Hamlets, nearly half of men (48%, n=30) and women (59%, n=43) believed paan chewing could cause dental problems and perceptions of paan chewing linked to mouth cancer was suggested in 24% (15) of men and 36% (26) of women (Ahmed et al. 1997 [+]). In a Tower Hamlets Bangladeshi sample, 23% believed paan was good for health; 43% were unaware of health consequences, with females and heavier users less aware of the health risks (Pearson et al. 1999 [+]). Nearly 50% of first generation Asian males from Leicester were aware of oral cancer, but this was slightly lower among Sikhs; however, more second generations heard of oral cancer (Vora et al. 2000 [+]).

Evidence statement 40: Quitting

Strong evidence from two UK cross sectional studies (Croucher et al 2002 [++]; Croucher et al. 2007 [++]), and moderate evidence from three UK cross sectional

studies (Ahmed et al. 1997 [+]; Pearson et al 1999 [+]; Summers et al. 1994 [+]) was found while investigating views and desires for quitting smokeless tobacco. Seventy-two percent (66/92) Bangladeshi women from Tower Hamlets found it difficult to go without tobacco, although 80% (74/92) desired to quit, while 20% (18/92) did not intend to quit (Croucher et al 2002 [++]). Over 50% of Bangladeshi men from Tower Hamlets wanted to give up chewing tobacco, and many had attempted to quit (67- 86%). Around a third of people indicated it would be easy to go without tobacco (Croucher et al. 2007 [++]). According to a Yorkshire sample, light chewers (<10 quids/day) were more likely to quit paan than heavier users, although 39% would quitif advised by a medical professional (Summers et al. 1994 [+]). More Tower Hamlets Bangladeshi men (25%) than women (5%) had given up paan ($p < 0.01$) (Pearson et al 1999 [+]). According to research set in Birmingham, 9% of males (8) and only 4%
(4) females had given up their habit (Bedi & Gilthorpe 1995 [+]).

Evidence statement 41: Accessibility and purchasing

Moderate evidence from one UK report (Rees 2007 [+]), and three UK cross- sectional studies (Bedi & Gilthorpe 1995 [+]; Longman et al. 2010 [+]; Prabhu et al. 2001 [+]) provided information regarding the accessibility of smokeless tobacco within the UK. Betel quid was purchased by mostly males (Bedi & Gilthorpe 1995 [+]),and intended for use in the family setting, as 81% of teenagers acquired products from home (Prabhu et al. 2001 [+]). A land survey revealed that paan is easily available in Asian shops within the UK and few products comply with current legislation (Longman et al. 2010 [+]; Rees 2007 [+]). Leicester and Tower Hamlets had the highest concentration of premises (supermarkets, news agents, and music and book shops) selling products (Longman et al. 2010 [+]).

Evidence statement 42: Substitution for cigarettes

Moderate evidence from one UK qualitative paper (Croucher & Choudhury 2007 [+]) revealed younger Bangladeshi men from Tower Hamlets may use paan as a way to obtain tobacco without smoking cigarettes, although problems of addiction to smokeless tobacco may still be present, making quitting difficult.

What are the views of health professionals regarding smokeless tobacco?

Evidence statement 43: Awareness and advice by dentists

Moderate evidence from two UK cross-sectional survey studies (Csikar et al. n.d [+]; Nathan (2010 [+]) of dental professionals in the UK examined awareness and advice of dental professionals. Dentists from Harrow were almost twice as likely to neglect to offer areca cessation to patients than neglect to provide smoking tobacco cessation counselling, citing that awareness of the issues and lack of understanding of support needed was a barrier (Nathan (2010 [+]). Of dentists that were aware of oral health impacts caused by smokeless tobacco use, half believed that it was a significant problem for their patients and this was especially true for dentists in Bradford and Kirkless than Leeds (Csikar et al. n.d [+]).

Evidence statement 44: Barriers and support needed for practitioners

Moderate evidence from three UK cross-sectional survey studies (Csikar et al. n.d [+]; Nathan (2010 [+]; Pearson et al 1999 [+]) examined barriers and supported needed for counselling on smokeless tobacco. In a survey of Yorkshire dentists, 75%(279/372) wanted access to resources, and 32% (90/372) required information on discussing smokeless tobacco, 30% (84/372) for waiting room resources, 22% (62/372) indicated assistance with oral cancer detection, and 15% (43/372) wanted training (Csikar et al. n.d [+]). Evidence by Nathan (2010 [+]) revealed that dentists had a lack of information about counselling, and many patients are in need, but dentists do not feel equipped to help. Ethnicity of dentists plays a role in counselling as 75% of Asian/African dentists were more likely to provide support than white dentists (43%) ($p < 0.006$) (Nathan (2010 [+]). Language barriers between South Asian clients and practitioners exist, as 73% of first generation Bangladeshi Tower Hamlets residences experienced language issues while visiting health professionals, with more females (94%) than males (58%) experiencing this problem ($p < 0.001$); resulting in only 20% registered with a dentist, and only 33% had visited a dentist in the past year, while 25% never visited a dentist (Pearson et al 1999 [+]).

What is the best way to target health information for South Asians?

Evidence statement 45: Targeting health information

Moderate evidence from two UK reports (HDA 2000 [+]; Rees 2007 [+]), and one study set in Leicester (Vora et al. 2000 [+]) examined targeting of health information

for South Asians. Second generation South Asian males from Leicester noted sources of health knowledge included school/college education, the press and media (where majority heard about oral cancer), and health education leaflets (Vora et al. 2000 [+]). South Asians primarily receive health promotion messages from the Asian broadcast media and print media, and this should be used to highlight the healthrisks of smokeless tobacco, provided language issues and culturally appropriatedesign are used (HDA 2000 [+]). Drawing upon the experiences of members of the community (vignettes) and using religion could be useful in reaching South Asians (HDA 2000 [+]).

Areas for which no evidence was found

Do any factors determine the particular varieties used?

Evidence statement 46: Varieties used

There was no evidence identified through the review process to support this question.

Cost Effectiveness

What is the cost-effectiveness of interventions?

Evidence statement 47: Cost-effectiveness

The literature search did not identify any economic analyses of smokeless tobacco cessation interventions. Details of the economics aspect of this project can be found in the economics report.

1. Introduction

1.1 Summary of project

This review is part of a larger project that covers two research questions, and an additional economics report will be reported separately. Project components are listed below:

- **Effectiveness review** (containing intervention effectiveness, other data relevant to intervention effectiveness, and intervention targeting)
- **Context review** (views, attitudes, opinions of smokeless tobacco; awareness issues)
- **Economics and cost effectiveness** consisting of a 'review of economic evaluations' and 'Economic modelling and cost effectiveness data. Modelling data will be reported separately.

1.2 Aims and objectives

The aim of this review is to systematically assess the evidence for effectiveness and cost effectiveness of interventions to help South Asians to stop using smokeless tobacco. This review will also explore the contextual factors that influence effectiveness of interventions; and explore reasons why South Asians use smokeless tobacco.

1.3 Research questions

1.3.1 Question 1: Effectiveness Review

- What types of interventions (behavioural, educational and/or pharmacological) are most effective and cost effective for cessation of smokeless tobacco use in South Asian populations worldwide and in the UK? Do they have any adverse effects?
- What external factors influence the effectiveness of the intervention (such ascontent, delivery, setting, who is delivering the intervention, intensity, duration and target setting)?
- What internal factors influence the effectiveness, of the intervention (such as age, socio-economic status, ethnicity, and attempts at cessation)?

The following sub-questions will be considered for Question 1:

- What is the diversity of the population (for example, in terms of age, gender or ethnicity)?
- What are the content, intensity, frequency, length and duration of the intervention?
- Where the intervention is delivered? Is transferable to other settings?
- Are there any adverse or unintended effects associated with effective implementation? (i.e., danger that people could start (or resume) smoking tobacco instead? Or could interventions not specifically tailored for South Asians have a negative impact on the community's attitude towards the NHS – or towards tobacco cessation initiatives?)
- Are there any social, cultural, religious or wider contextual factors that prevent (or support) effective implementation?
- How should interventions be targeted and tailored for the different subcategories of users within the South Asian community (grouped, for example, by gender, age, religion, socioeconomic status or by country of origin)?

1.3.2 Question 2: Context Review

- What opinions, attitudes or cultural practices encourage (or predispose) South Asian people in England to use smokeless tobacco?
- Do these factors also determine the particular varieties used?
- What are the views of health professionals regarding smokeless tobacco?
- What is the best way to target health information for South Asians?

The following sub-questions will be considered for Question 2:

- What are the views of sub-groups of South Asians regarding smokeless tobacco?
- Are there variations in smokeless tobacco use?

2. Background

According to a recent report of the Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR 2008), the use of smokeless tobacco products in the UK is largely restricted to members of the Indian, Pakistani and especially Bangladeshi communities, which make up 4.5% of the population—or just over two million people. Smokeless tobacco is defined as any product containing tobacco that is placed in the mouth or nose and not burned. The types of smokeless tobacco products most used in the UK often contain a mix of ingredients including slaked lime, areca nut and spices, flavourings and sweeteners (Bedi 1996).

Tobacco is often consumed in combination with other products. Betel pepper leaf is used to wrap the fillings to form a quid. The leaf has a mint flavour and is considered a mouth freshener. The leaf (paan) itself is considered as relatively harmless: the health risks arise from the tobacco and other ingredients contained in the paan (SCENIHR 2008).

Chewing tobacco is common among the Bangladeshi community—with 9% of Bangladeshi men and 6% of Bangladeshi women use chewing tobacco (Wardle 2006)—however, these numbers may be subject to underreporting of use (Roth et al. 2009). Furthermore, among Bangladeshi women, use of chewing tobacco was greatest among those aged 35 and over (26%). Among men, there was no differencein use of chewing tobacco by age (Wardle 2006). Betel quid (with and without tobacco) is the most commonly used product among this population (NHS Health andSocial Care Information Centre, Public Health Statistics 2005).

These products are associated with a number of health problems including: nicotine addiction (SCENIHR 2006), mouth and oral cancer (Critchley & Unal 2003), oral pain (Pau et al. 2003), myocardial infarction and stroke (Boffetta & Straif 2009), loss in bone density (Quandt et al. 2005), problems in pregnancy and following childbirth (including stillbirth and lower birth weight) (England et al. 2010; Gupta & Subramoney2004) and late diagnosis of dental problems (West et al. 2004).

Smokeless tobacco can be broadly classified into products that are chewed and those that are sucked. Chewed products such as gutkha and pan masala, which are widely used by the South Asian community in the UK are virtually unregulated and can be sold freely (Tobacco Advisory Group of the Royal College of Physician 2007).

Current practice guidelines commissioned by the Health Development Agency for England recommends that dental professionals, GPs and other relevant health professionals should: 1) enquire about smokeless tobacco use in South Asian patients and record the outcome in patient notes, 2) ensure that known smokeless tobacco users are aware of the potential health risks, advise them to stop and record their advice and the patient's response in the notes, and 3) recommend smokeless tobacco users who wish to make a cessation attempt to use trained counsellors for behavioural support (West et al. 2004). Furthermore, it is recommended that dental professionals should examine the oral cavity of smokeless tobacco users carefully forany mucosal changes when the opportunity arises and specialist smoking cessation services should provide counselling for smokeless tobacco use where there is a demand (West et al. 2004).

Given the wide-spread use and negative health effects of smokeless tobacco among South Asians, there is a need for clear and consistent guidance and assurance that the most effective interventions are implemented to improve the health of this population. This need has prompted the National Institute for Health and Clinical Excellence to commission this review in order to inform guidance on public health interventions for the cessation of smokeless tobacco use. There have been several other reviews that examined the effectiveness of smokeless tobacco cessation; however, this literature did not specifically examine South Asians.

One systematic review has explored the effectiveness of interventions for smokeless tobacco cessation (Ebbert et al. 2009). This review included 20 trials—of which eight assessed the effect of pharmacological interventions and 14 studied the effect of behavioural interventions. One included study assessed both nicotine gum and minimal contact or intensive behavioural intervention in a factorial design, and one study compared minimal intervention to an intensive behavioural intervention with either active or placebo nicotine patches. Participants included in Ebbert et al. (2009) were users of any tobacco product that is placed in the mouth and not burned. This included users of moist snuff, chewing tobacco and betel quid. A total of 9982 users of smokeless tobacco were included in the review. Outcome measures for Ebbert’s review and meta-analysis included tobacco abstinence six months or more after the start of the intervention. In cases where total tobacco abstinence was not reported, abstinence from ST alone was used. A secondary outcome for the meta-analysis was abstinence from all tobacco use. Trials with shorter follow up or without quit

rates were excluded. Validated rates of tobacco abstinence were used where reported. For pharmacological interventions, the efficacy of bupropion SR (sustained-release) (Dale 2002; Dale 2007), nicotine patch therapy (Hatsukami2000; Howard-Pitney1999; Stotts 2003; Ebbert 2007), and nicotine gum for ST users (Boyle 1992; Hatsukami 1996) was assessed. The trials assessing bupropion showed no continuous effect on tobacco abstinence (Dale 2002; Dale 2007; Odds ratio (OR) 0.86, 95% CI: 0.47 to 1.57, I^2 = 0%). For trials assessing the effectiveness of NRT, no evidence of heterogeneity was found among randomized controlled trials (RCTs) testing nicotine patch therapy nor among trials testing nicotine gum therapy. Furthermore, at six months or longer, neither nicotine patch nor nicotine gum was seen to increase abstinence rates.

The evidence for the effectiveness of behavioural interventions is based on 12RCTs—six of which showed significant results (Boyle 2004; Severson 1998; Severson 1998; Severson 2006; Severson 2007b;Walsh 2003), four trials showed non-significant intervention effects (Cigrang 2002; Severson 2007a; Stevens 1995; Stotts 2003) and two studies showed no evidence of effect (Cummings 1995; Gansky2005). Substantial heterogeneity was observed when studies were grouped and analysed by organization (I^2=84%) and by oral examination (I^2=nil based on interventions that included an oral exam and the exclusion of one outlier; I^2=61%based on interventions that did not include an oral exam). Additional sub- group analyses indicated that grouping by telephone support showed low heterogeneity and a significant OR for interventions that included telephone support (random effects OR: 2.09, 95% CI 1.68 to 2.61, I^2 = 24%) compared to sub-groups testing interventions without telephone support, (random effects OR: 1.18, 95% CI:
0.81 to 1.73, I^2 = 78%). Based on the post-hoc analyses, the authors concluded that behavioural interventions which include telephone counselling or an oral examination may increase abstinence rates more than interventions without these components—while pharmacological interventions showed not significant benefit in relation to long-term tobacco abstinence. In conclusion, the results from Ebbert et al. (2009) showed the benefit of behavioural interventions in changing smokeless tobacco use.

Since the publication of Ebbert et al. (2009), two subsequent updates have been published. The first update, Ebbert et al. (2011), provided data from three additional pharmacological studies which assessed the effectiveness of nicotine lozenges (Ebbert et al. 2009; Ebbert et al. 2010a) and varenicline (Fagerstrom et al. 2010) and

two behavioural interventions—one assessing the efficacy of telephone-based counselling (Boyle et al. 2008) and the other assessed the effect of a school-based intervention which included nurse-led group cessation counselling sessions (Walsh et al. 2010)—while the second (Ebbert & Fagerstrom, 2012) updates Ebbert et al. (2011) by providing data from one additional pharmacological trial of varenicline (Ebbert et al. 2010b). The results from Ebbert et al. (2011) found that the use of nicotine lozenges did not increase abstinence rates of smokeless tobacco use compared to placebo (OR 1.25; 95% CI: 0.75-2.09, I^2=49%). However, the one new varenicline trial (Fagerstrom et al. 2010) was found to increase tobacco abstinence rates at six months compared to placebo (OR 1.6, 95% CI: 1.08-2.36). Similarly, Ebbert & Fagerstrom's (2012) update of pharmacological trial data showed that varenicline was associated with higher abstinence rates compared to placebo at six months follow-up (57.9% vs. 31.6%, p=0.011). With regard to the efficacy of behavioural interventions, Ebbert et al. (2011) found that the inclusion of data fromthe two additional behavioural trials (Boyle et al. 2008; Walsh et al. 2010) did not change overall heterogeneity compared to the Ebbert et al. (2009) review (I^2=69% vs.I^2=68%, respectively). Thus, Ebbert et al. (2011) concluded that behavioural interventions are beneficial to help increase abstinence rates of smokeless tobacco use compared to placebo.

While Ebbert et al. (2009) and subsequent updates (Ebbert et al. 2011; Ebbert & Fagerstrom, 2012) provide additional valuable evidence regarding the effectiveness of pharmacological and behavioural interventions to treat smokeless tobacco use, neither Ebbert et al. (2009) review nor the two updates provide any evidence from South Asian populations or studies conducted outside the United States or Sweden. Therefore, the question remains as to the applicability of the findings to South Asian in the UK.

3. Methods

3.1 Methods for identification of evidence

This review aims to systematically examine evidence for the effectiveness and cost effectiveness of interventions and contextual understanding of smokeless tobacco use among South Asians. The research team, in collaboration with NICE, have identified a search strategy most suitable for this purpose.

3.2 Search Strategy

Systematic searches of relevant health related databases were undertaken by the ScHARR Information Specialist. Through an iterative process a search strategy was drawn up and agreed with the NICE Information Specialist. The search strategy was initially designed using terms from the existing Cochrane review combined with additional terms identified by the information specialist (1st iteration). The search was then refined using additional terms sourced from the review protocol (2nd iteration). The NICE information specialist supplied further terms for a third iteration of the search and the final strategy (4th iteration) was agreed, dispensing with country specific terms (e.g. UK) and instead broadening the search out to include South Asians living in any country.

The search strategy searched for any kind of evidence; there were no restriction to specific study designs (e.g. RCTs, systematic reviews, cohort studies). Searches were limited by year (1990-2011). The multiple search iterations were undertaken from July 8th to August 19th. (Iterations 1-2 July 8th - July 22nd; Iterations 3-4 August 8th to August 19th). The search strategy combined terms for smokeless tobacco and South Asians. This set of “population” terms was then combined with terms for cessation (search 1) and left open (e.g. no cessation terms) for search 2, giving two separate sets of results for each database. Sample search strategies can be found inAppendix 1.

The databases searched were: Embase, PyschINFO, Medline, Medline in Process, CINAHL, Cochrane Database of Systematic Reviews, Cochrane Central Register of Controlled Trials, Database of Abstracts of Reviews of Effects, HTA Database, NHS EED, Social Science Citation Index, Science Citation Index, ISI Conference Proceedings Citation Index - Science, ISI Conference Proceedings Citation Index Social Science and Humanities, ASSIA, British Nursing Index. Dates: 1990-2011

In addition to the systematic search, the following additional methods were utilised:

- Reference list checking of included papers.
- Cited reference search for included papers in the Web of Science
- Consulting 'grey' literature sources OpenGrey and HMIC.

Searches for the cost-effectiveness/economics review were undertaken at the same time as the effectiveness searches, using population (South Asian smokeless tobacco users) terms only, with the same date restrictions in NHS EED via Wiley and Econlit via OVID SP. Where additional information requirements were identified, targeted searches were undertaken for model parameters.

The search results for all searches (systematic and additional) were imported into Reference Manager and de-duplicated. Following this, the results were sifted by the systematic reviewers.

3.3 Study selection

The sifting process was completed by two reviewers, and identified 2968 citations. Relevant papers were retrieved and assessed and those fulfilling the criteria were included. During the process, all decisions were checked by a second reviewer with difference resolved by discussion.

Inclusion and exclusion criteria for the interventions (question 1) and context reviews (question 2) varied since each question attempted to capture different aspects of smokeless tobacco use among South Asians. For question 1, evidence from any country was considered provided papers had described an intervention, examined relevant outcomes, and were targeted at South Asians. For question 2, the focus was placed on papers that explored contextual issues in OECD countries since these would be most applicable to the UK setting.

3.3.1 Question 1: Inclusion for interventions

For Question one, given the lack of evidence, any smokeless tobacco cessation intervention delivered to South Asians from any country was included. This decision to include evidence from all countries was appropriate since the culture of South Asians outside the UK maybe similar to UK, as they may have initially lived in countries where intervention studies originated.

- **Populations:** worldwide studies that focused on South Asians that examined interventions for smokeless tobacco cessation.
- **Interventions**:
    - Pharmacological interventions for individuals or groups
    - Behavioural support or counselling for individuals or groups offered by evidence-based services.
    - Brief interventions (including brief advice) by health and social care professionals, including dental practitioners and GPs.
    - Brief interventions (brief advice) by community members or peers.
    - Local community-based initiatives to raise awareness of the harm caused by smokeless tobacco and to encourage the uptake of cessation services by people who use smokeless tobacco.
    - Interventions to raise awareness and knowledge among health and social care professionals about smokeless tobacco use.
    - School-based, community-based, and workplace programmes.
- **Outcomes**: intervention studies that include outcome data to be used for the effectiveness review, process evaluations, adverse effects, views of interventions
- **Study designs**: RCT, non-randomised studies, quasi-experimental, controlled before and after studies, process evaluations or qualitative studies where a intervention has been offered
- **Dates**: 1990 onward
- **Language of paper**: English

Question 1: Exclusion for interventions

- Non-English studies
- Non-South Asian populations
- Non-interventional studies (i.e. no intervention was offered)

5.3.2 Question 2: Inclusion criteria for context review

For question two, the focus was on contextual evidence from OECD countries since the purpose of this question was to determine the context of smokeless tobacco within South Asians living in countries outside South Asian.

Populations:

- South Asian populations living in OECD countries who are current or past users of smokeless tobacco.
- Clinicians, support workers, and front-line staff who have worked with South Asian populations in the area of smokeless tobacco.

Reported findings

- Views of service users who are of South Asian origin
- Views of friends and family members of users smokeless tobacco

- Knowledge and attitudes of health professionals towards smokeless tobacco and/or smokeless tobacco interventions
- Views of clinicians, support workers, and front-line staff

Study design: qualitative and quantitative methods; however, all study designs have been considered, provided studies were relevant to research questions

Countries: Evidence from OECD countries

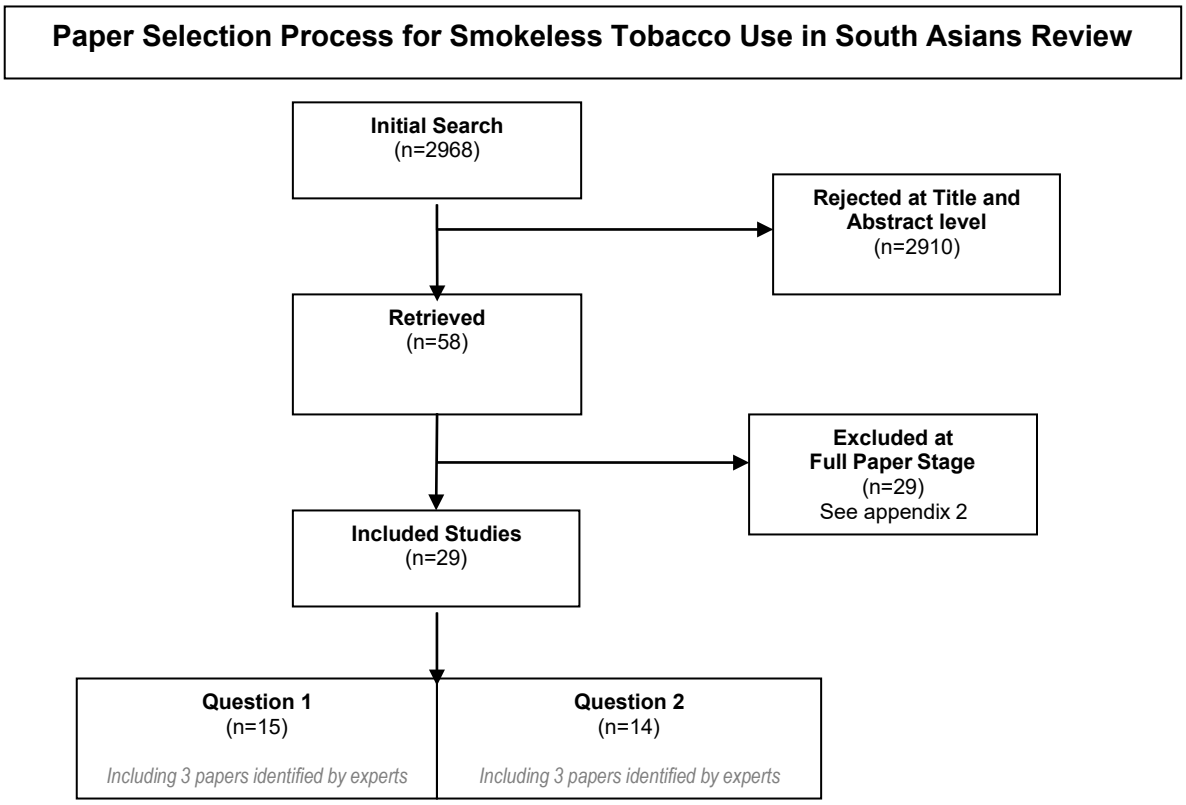
Dates: 1990 onward

Language: English

Question 2: exclusion criteria for context review

- Non South Asian Populations; Non-service providers
- Non-UK setting
- Websites, blogs, anecdotal evidence

Figure 1: Flow chart of paper selection



3.4 Study description: Question 1 (Effectiveness Review)

3.4.1 Types of studies

- Randomised controlled trials that examined smokeless tobacco prevention and usage among South Asians
- Non-randomised studies that examined smokeless tobacco cessation interventions
- Process evaluations of interventions targeted at South Asians

3.4.2 Types of participants

South Asian men, women and children who were users or non-users of smokeless tobacco products (any product containing tobacco that is placed in the mouth or nose and not burned).

3.4.3 Types of intervention

- School-based, community-based and workplace education programmes
- Behavioural (brief advice, encouragement, support counselling)
- Pharmacological (nicotine replacement therapy (NRT) (single and combined therapy))
- Combined behavioural and pharmacological therapies

3.4.4 Types of outcomes

A range of outcomes were considered:

Tobacco use and Intentions to use tobacco

- A reduction in self-reported use of all types of smokeless tobacco, both frequency of use by individuals and in terms of the overall number of people using it
- Number of visits, frequency of service use
- Effectiveness of strategies to reduce, cut down, or switch to less harmful smokeless tobacco products
- A reduction in morbidity and mortality caused by smokeless tobacco use after the introduction of an intervention
- A rise in the number of South Asian smokeless tobacco users who set a quit date and quit in the short term (4 weeks) or the long term (12 months)
- Components of interventions that were successful in reaching South Asians
- Effective methods of tailoring interventions to South Asians

- Changes in tobacco use(chewing and smoking) using measures such as salivary cotinine scores, self-reported tobacco use and Fagerström scores
- Changes in intentions to use tobacco using measures such as self-reported intentions to chew or smoke tobacco in the future
- Prevalence of tobacco habit in the population (chewing and smoking) pre- and post-intervention; age-specific prevalence rates
- Quit rates
- Initiation rates
- Number of paan quid tobacco chewed daily
- Mean age of starting tobacco chewing
- Mean nicotine dependency score
- Adverse effects and withdrawal symptoms (Physical and psychosocial)

Psychosocial and Mediating risk factor outcomes

- Measurement of and changes in intra-personal factors including: knowledge of health effects, beliefs about social effects, reasons to use tobacco, reasons not to use tobacco, self-efficacy (refusal skills), social susceptibility of chewing and social susceptibility of smoking
- Changes in intra-personal factors
- Differences in psychosocial risk factors between groups

Social-environmental risk factor outcomes

- Measurement of and changes in normative beliefs about tobacco use, perceived prevalence of chewing, perceived prevalence of smoking, normative expectations of use, knowledge about public policies, support for public policies, self-efficacy (advocacy skills) and exposure to advertising
- Changes in social-environmental factors
- Differences in social-environmental risk factors between groups

Outcomes related to the process of intervention implementation

- Training-related measures (proportion of interventionists trained, proportion of interventionists satisfied with programme components and materials; understanding of programme and materials)
- Completeness of the intervention (Amount or number of intended units of each intervention or component delivered or provided by interventionists)

- Exposure of the intervention (Extent to which participants actively engage with, interact with, are receptive to, and/or use materials or recommended resources; can include “initial use” and “continued use.”)
- Satisfaction of the intervention (Extent to which the participants are satisfied, understand, actively engage with, interact with, are receptive to and absorb or imbibe or use programme materials or recommended resources)
- Participation in the intervention (Proportion of the intended audience that participates in the intervention; measured by attendance; documentation of barriers to participation)

3.5 Study description: Question 2 (Context Review)

3.5.1 Types of studies

- Cross-sectional studies that examined smokeless tobacco prevention and usage among South Asians
- Qualitative studies of views and use of smokeless tobacco in South Asians
- Reports and project briefs

3.5.2 Types of participants

South Asian men, women and children who were users or non-users of smokeless tobacco products, and health care professionals.

3.5.3 Types of outcomes

Outcomes relating to the target population:

- Knowledge and attitudes among the South Asian community in relation to smokeless tobacco use after use of a smokeless cessation service
- Factors that impact on the use of smokeless tobacco products of certain groups of users (sub-population analysis pending availability of data)
- Clinician awareness of the prevalence of smokeless tobacco use

3.6 Study appraisal

3.6.1 Criteria for appraising relevance and quality assessment

Two reviewers screened the titles of all papers identified by the search strategy. Criteria for inclusion and exclusion were applied to determine the relevance of each

paper. During this process, the research team would discuss any discrepancies or difficulties with the paper screening process. Once the initial sift was completed, each reviewer checked the other reviewer's exclusions to ensure no relevant studies were missed. Reasons for study exclusion were recorded. Papers were coded into three categories (include, exclude, background) in reference manager software. Codes were established for rejected papers, accepted papers, and background material.

Full text copies of all potentially relevant papers were retrieved. A data extraction forms was developed in consultation with clinical advisors and piloted. Data on quality, characteristics of participants, intervention or themes and relevant outcomes were independently extracted by one reviewer and checked by the second reviewer.

Two reviewers assessed the quality of the RCTs, non-randomised studies (NRS), cross-sectional studies and qualitative studies using appropriate methodology checklists (National Institute for Health and Clinical Excellence, 2009). For interventions and NRS, this was done by using the quality appraisal checklist for quantitative interventions studies which examines 7 key methodological domains; method of recruitment, method of randomisation, allocation concealment, blinding of participants, baseline comparability, intention to treat analysis and loss to follow-up.

Cross-sectional studies were assessed using the quality appraisal checklist for quantitative studies reporting correlations and associations which examines the following domains of study design, characteristics of study participants, definition of independent variables, outcomes assessed and method of analysis.

Qualitative studies were assessed using the quality appraisal checklist for qualitative studies which assess the domains of theoretical approach, study design, data collection, trustworthiness of the methods and researchers' involvement, data analysis methods and reporting of ethics.

For all included studies an overall risk of bias score was given; ++ (good quality, very low risk of bias), + (reasonable quality, low risk of bias), and - (poor quality, high risk of bias).

3.7 Data analysis

RCTs and non-randomised studies (NRS) were analysed using a narrative approach. Results were presented in tabular format and a narrative summary of the participant

characteristics, recruitment, intervention components and main findings will be provided in subsequent chapters. Meta-analysis and the use of forest plots was not appropriate for the studies included in this review since there was a high degree of heterogeneity across studies, making it difficult to group studies in a meta-analysis without introducing bias. For the papers included in the contextual review, a narrative summary which provides details regarding the study characteristics, recruitment, and the main study findings were provided.

3.8 Cost effectiveness

The literature search did not identify any economic analyses of smokeless tobacco cessation interventions. Details of the economics aspect of this project can be found in the economics report.

4. Question 1: Intervention effectiveness review

The findings in this section of the review will address the effect of interventions designed to help South Asians to stop using smokeless tobacco. A total of fifteen studies have been included in this review. Twelve studies were identified from a formalised and systematic search strategy (Anantha et al. 1995; Bate et al. 2009; Croucher et al. 2003a, 2003b; Goenka et al. 2010; Mishra et al. 2009; Pau et al. 2003; Perry et al. 2008; Perry et al. 2009; Stigler et al. 2006, Stigler et al. 2007 Stigler et al. 2011), and the remaining three studies (Croucher et al. 2011a, 2011b, 2011c), which consisted of grey literature and unpublished studies, were provided by NICE and subject experts. The majority of the data is based on findings from two intervention programs which targeted children and adult South Asians living in India and the UK (Project MYTRI and the BSTP). The remaining evidence available for review is from a community-based RCT (The ATCEP) and a non-randomised workplace cessation programme (The WNTD programme).

4.1 Study quality

Assessment of internal validity of included studies was carried out using the methodology checklist (randomised controlled trials) from the Methods for development of NICE public health guidance (National Institute for Health and Clinical Excellence 2009). Overall assessment of internal validity was coded according to the Methods guidance (National Institute for Health and Clinical Excellence 2009):

> ++ All or most of the criteria have been fulfilled. Where they have not been fulfilled the study conclusions are thought very unlikely to alter.
>
> + Some of the criteria have been fulfilled. Those criteria that have not been fulfilled or not adequately described are thought unlikely to alter the study conclusions.
>
> – Few or no criteria have been fulfilled. The study conclusions are thought likely or very likely to alter.

In addition, because many of the included studies used a randomised, clustered design (by school or village), criteria related to ‘allocation concealment’ and ‘blinding of study participants and investigators’ were considered unimportant and the overall quality of a study was not downgraded simply because either of these criteria was not fulfilled. Seven studies provided results from RCTs (Project MYTRI—Bate et al. 2009; Goenka et al. 2010; Perry et al. 2009; Stigler et al. 2006; Stigler et al. 2007;

Stigler et al. 2011; and the ATCEP study—Anantha et al. 1995). Randomisation was carried out adequately for the Project MYTRI and the ATCEP study. All seven studies reporting results from the Project MYTRI and the ATCEP study were judgedto be of reasonable quality (+). These studies adequately explained participant selection, selection of study variables, outcomes, and results. However, details regarding the comparator were lacking and loss to follow-up was not reported in four studies (Anantha et al. 1995; Perry et al. 2008; Stigler et al. 2006; Stigler et al. 2011).None of the studies providing results from Project MYTRI or the ATCEP reported allocation concealment, blinding or details regarding inclusion/exclusion criteria. Furthermore, none of the studies reported power. Perry et al. (2008) did not report any outcomes but rather details describing the process of translational research related to Project MYTRI. However, the description of the methods used to evaluate intervention effectiveness and appropriateness were judged to be of reasonablequality (+).

Participants for the BSTP and the WNTD programme were volunteers. The use of volunteers raises the possibility that sampling bias may have occurred due to the fact that these volunteer could be different than non-volunteers (highly motivated, better health status) and therefore potentially not representative of the source population. This bias usually, but not always, favors the treatment group, as volunteers tend to be more motivated and concerned about their health thereby reducing reliability of the study results. Therefore, any observed or measured effect cannot be concluded as a result of the intervention. When reported, matching of participants or stratification was used to minimise selection bias of the sample (Croucher et al. 2003a [+]). However, no details regarding the methods used to assign volunteers to treatment types were provided. Three studies selected participants via retrospective review of client records generated from BSTP sample population (Croucher et al. 2011a [-], 2011b [+], 2011c [+]). Only two studies provided information regarding a comparison condition (Croucher et al. 2003a [+]; Croucher et al. 2011c [+]). Furthermore, it is unclear as to whether the remaining studies included a comparison group since these details were not provided. One study provided details related to calculation of sample size (Croucher et al. 2003a [+]) while the remaining studies provided no information related to power. Contamination bias was judged to be highin Mishra et al. (2009 [-]) as it is unclear whether a comparison group was exposed tothe intervention or not (see tables 1 and 2).

4.1.1 Loss to follow-up

Loss to follow-up was reported in three studies (Bate et al. 2009 [+]; Perry et al. 2009 [+]; Stigler et al. 2007 [+]). Time constraints and limited access to subsamples of students in some schools resulted in incomplete data for 5 schools included in Project MYTRI (Perry et al. (2009 [+]). Stigler et al. (2007 [+]) and Bate et al. (2009 [+]) reported that the attrition rate for the MYTRI cohort was higher among both schools and students in the control condition compared with the intervention (31.5% versus 24.0%; $p < 0.01$) and for students who reported tobacco use at baseline compared with those who did not (44% versus 27%; $p < 0.01$), but there was no differential attrition between study conditions by tobacco use. Three BSTP-related studies (Croucher et al. 2011c [+]; Pau et al. 2003 [+]; Croucher et al. 2003b [+]) and the WNTD programme (Mishra et al. 2009 [-]) did not report loss to follow-up. The remaining three BSTP-related studies provided some data related to follow-up (Croucher et al. 2011a [-], 2011b [+]; Croucher et al. 2003a [+]). Croucher et al. (2011b [+]) reported a 4% loss to follow-up over the course of the intervention period while Croucher et al. (2003a [+]) reported an overall 9% loss after four weeks.

Table 1: Quality assessment of RCTs

Study	Sample size	Recruitment	Randomisation	Allocation concealment	Blinding	Intention to treat	Baseline Comparability	Loss to follow up reported	Complete/ Valid Outcome Data	Quality Score
Anantha 1995	171527 Un clear as to the final sample size	Yes Villages located in three areas within the Kolar District were selected	Yes A stratified random-sampling method was used to select the villages. The exact method not described	NR	NR	NR	Yes Significant differences between baseline and follow-up measures	NR	Unclear	+
Bate 2009	8369	Yes Schools were recruited	Yes Exact method not described	NR	NR	NR	NR	Yes	Unclear	+
Goenka 2010	5564	NR	Yes A group-randomised trial design, was used to recruit, match and randomly assign to intervention and control groups	NR	NR	NR	NR	Yes	Unclear	+
Perry 2009	14063	Yes Schools were recruited	Yes Exact method not described	NR	NR	NR	Yes No significant differences	Yes	Unclear	+
Perry 2008	11748	Yes Schools were recruited	Yes Exact method not described	NR	NR	NR	Yes No significant differences	NR	Unclear	+
Stigler 2011	14085	Yes Schools were recruited	Yes Exact method not described	NR	NR	NR	NR	NR	Unclear	+
Stigler 2007	8369	Yes Schools were recruited	Yes Exact method not described	NR	NR	NR	NR	Yes	Unclear	+
Stigler 2006	11642	Yes Schools were recruited	Yes Method NR	NR	NR	NR	NR	NR	Unclear	+

Table 2: Quality assessment of NRSs

Study	Population representative of the source population	Allocation concealment	Blinding	Incomplete outcome data	Selection bias and risk of confounders	Contamination bias	Sample size	Quality Score
Croucher 2011a	Yes	NR	NR	Among non-quitters, 9% loss to follow-up; ITT analysis not reported	Volunteer bias;	Unclear	248	-
Croucher 2011b	Yes	NR	NR	4% loss to follow-up; ITT analysis not reported	Volunteer bias;	Unclear	203	+
Croucher 2011c	Yes	NR	NR	Loss to follow-up not reported; ITT analysis not reported	Volunteer bias; included and excluded participants were comparable	Unclear	419	+
Croucher 2003a	Yes	NR	NR	12/130 loss to follow-up	Volunteer bias; matched on baseline characteristics	Unclear	130	+
Croucher 2003b	Yes	NR	NR	Loss to follow-up not reported; ITT analysis not reported	Volunteer bias; statistical modelling for confounders	Unclear	52	+
Mishra 2009	No	NR	NR	Loss to follow-up not reported; ITT analysis not reported	Volunteer bias; no differences in baseline characteristics	Unclear	104	-
Pau 2003	Yes	NR	NR	Loss to follow-up not reported; ITT analysis not reported	Volunteer bias; no details regarding adjustment	Unclear	58	+

4.2 Study typology

The ATCEP, Project MYTRI, the BSTP and the WNTD programme utilised cross-sectional questionnaires to collect participant data. Questionnaires wereadministered once (the WNTD programme) or multiple times (The ATCEP, Project MYTRI, the BSTP). Both individual (The ATCEP, Project MYTRI, the BSTP and the WNTD) and group-level data (The ATCEP and Project MYTRI) were collected.

Table 3: Included study typology

Study	Setting	Aim	Method‡
The Anti-Tobacco Community Education Program—ATCEP [1]			
Anantha 1995	India	To evaluate the impact of tobacco education on tobacco-habit prevalence rates, the number and rates of persons who had quit the habit, and the rate of uptake of the habit by prior non-users of tobacco.	RCT; SI; RS
The Bangladeshi Stop Tobacco Project—BSTP [2]			
Croucher 2003a	Tower Hamlets, UK	To establish the short-term outcomes for successful tobacco cessation of a programme offering UK resident Bangladeshi women chewing paan with tobacco, recruited through community groups, NRT in addition to brief advice and encouragement alone.	NRS; PS; QE
Croucher 2003b	UK	To assess the oral health status of a sample of UK resident Bangladeshi women tobacco-in-paan users and its relationship to participant age and number of daily paan, to determine the prevalence of oral pain at baseline and at the one-week post-cessation follow-up, and to explore the relationship between oral health status and changes in self-reported oral pain at baseline and at the one-week post-cessation follow-up.	NRS; QE
Croucher 2011a	Tower Hamlets, Leicester and Bradford, UK.	To address the current evidence gap with respect to providing smokeless tobacco cessation support, recognising the need to assess the scalability of the principles underpinning projects like the Bangladeshi Stop.	NRS; PR
Croucher 2011b	Tower Hamlets, Leicester and Bradford, UK.	To (1) review the current evidence base for cessation support for smokeless tobacco users, sharing the outcomes with an advisory group to identify opportunities for implementing locality specific smokeless tobacco cessation services; (2) pragmatically pilot these services in two new locations alongside those already offered by the Bangladeshi Stop Tobacco Project (BSTP) activity in East London, assessing their effectiveness, acceptability and accessibility amongst clients; (3) develop a best practice checklist for incorporation into any practical and affordable service delivery in areas where smokeless tobacco use is high.	NRS; RR; PR; PE
Croucher 2011c	Tower Hamlets, UK	To investigate predictors of successful short-term smokeless tobacco cessation in women from a disadvantaged and underserved community.	NRS; RR
Pau 2003	Tower Hamlets, UK	To explore the oral pain reported by the Bangladeshi female tobacco-chewing volunteers in Croucher et al. (2003a) study and to investigate its relationship with psychological distress.	NRS

Mobilising Youth Tobacco-Related Initiatives in India—Project MYTRI [3]			
Bate 2009	India	To investigate whether the Mobilizing Youth for Tobacco—Related Initiatives in India (MYTRI) altered the psychosocial risk factors as intended, and whether the changes in psychosocial risk factors were, in turn, responsible for altering students' tobacco-use intentions.	RCT; SI
Goenka 2010	India	To describe the process evaluation of Project MYTRI in Indian schools.	RCT; PE
Perry 2008	India	To describe the process of translational research in Project MYTRI, with particular attention to differences between the United States and Indian contexts and implications for practice.	TR
Perry 2009	India	To assess the effectiveness of Project MYTRI to reduce tobacco use rates among adolescents in an urban area of India.	RCT; SI; RS
Stigler 2006	India	To explore possible explanations for why 6th grade students in Project MYTRI might be using tobacco at higher rates. .	RCT; SI
Stigler 2007	India	To investigate whether Project MYTRI altered the psychosocial risk factors as intended, and whether the changes in psychosocial risk factors were, in turn, responsible for altering students' tobacco-use intentions.	RCT; SI
Stigler 2011	India	To present the results of a mediation analysis of Project MYTRI. Specifically, it examines how the program achieved its effects in regards to reducing students' tobacco use intentions and tobacco use behaviors.	RCT; SI; RS
World No Tobacco Day Cessation Programme—WNTD [4]			
Mishra 2009	India	To formulate a Model Workplace Tobacco Cessation Program which could be replicated in other workplaces to promote tobacco control activities. The program aimed at studying the prevalence of tobacco consumption in its various forms among industrial employees and to provide professional help for quitting tobacco.	NRS; SI

‡**Method**:
RCT: Randomised controlled trial, NRS: Non-randomised study, QE: Quasi-experimental, PS: Pilot study, PE: Process evaluation, PR: Progress review, RR: Retrospective review, TR: Translational research, SI: survey/interview; RS: Repeated survey, SBS:, CBS:, WPS:

Community-based setting [1, 2]
School-based setting [3]
Workplace setting [4]

4.3 Included study characteristics

Population characteristics: Nine out of fifteen included studies were conducted in India. Seven of these studies reported outcomes from one school-based intervention trial (The Mobilizing Youth for Tobacco—Related Initiatives in India (Project MYTRI)),one study reported outcomes from a community-based trial ('Anti-Tobacco Community Education Program' (ATCEP), and one study provides data from a

workplace cessation trial (World No Tobacco Day Programme—WNTD). The remaining six studies were conducted in the UK and reported outcomes related to the Bangladeshi Stop Tobacco Project—BSTP. Some studies targeted the whole population within a defined geographical area (Anantha et al. 1995 [+]), while others targeted particular population subgroups on the basis of increased risk, for example, Bangladeshi females in local housing estates (BSTP). There was also considerable variation in the size, urbanisation and socio-demographic characteristics of study communities.

Setting, target population and recruitment: Project MYTRI is a school-based programme conducted in an urban setting. The ATCEP and the BSTP are community-based programmes conducted in economically-deprived areas and the WNTD programme was a conducted in a work-site setting. Reported findings related to Project MYTRI are based on subsets of students from a core population of 14 085 students in Grades 6 through 9 enrolled in 32 private and government schools inDelhi and Chennai, India. The community-based trial—ATCEP targeted all residents residing within the Karnataka State of India and included 41 779 male and female individuals in 117 intervention villages and 256 control villages. The WNTD programme included 104 employees working in a chemical industrial unit in Ratnagiri district in Maharashtra, India. For the six remaining studies related to the BSTP studythe target population was comprised of resident Bangladeshis living in Tower Hamlets, Leicester and Bradford, UK. The number of participants for these studies ranged from 52 to 419 for a total of 1214. However, the amount of overlap between these six studies is undetermined. Methods of recruitment included the use of media and/or health education campaigns, community presentations, friends and family members, community centres, GPs and health centres. For Project MYTRI, schools were recruited by the study investigators.

Participant characteristics: A considerable amount of variation in participant samples was found between the studies included in this review. The age range for participants included in Project MYTRI was 10-16 years, and 54.9% were males. Baseline characteristics were comparable between intervention and control groups for Project MYTRI. The BSTP included participants aged 14-84 years. The mean age across BSTP studies was 44.6 years The number of paan quid tobacco chewed daily ranged from 1-48 (mean: and the age of first pan use ranged from 5-63 years—with a mean age of 22.6 years for BSTP-related studies that reported participant age. Three

studies reported a mean nicotine dependency score (Croucher et al. 2011a [-], 2011b [+], 2011c [+]). The mean nicotine dependency score ranged from 4.39-10.4. Two BSTP studies reported a small proportion of males in the sample (Croucher et al. 2011a [-], 2011b [+]) while the remaining studies included only female participants (Croucher et al. 2003a [+], 2003b [+]; Croucher et al. 2011c [+]; Pau et al. 2003 [+])or no data regarding gender was provided (Mishra et al. 2009 [-]). Ethnicity was not specifically reported in Project MYTRI, the ATCEP or the WNTD program. BSTP participants were mostly Bangladeshi (>70%) and mostly female (~80%). Baseline characteristics within four studies were comparable (Croucher et al. 2003a [+], 2003b[+]; Croucher et al. 2011c [+]; Mishra et al. 2009 [-]), the remaining studies did not report baseline comparability. Baseline socio-demographic data for the ATCEP study were not reported. However, there was variation between the experimental and control conditions regarding baseline prevalence of type of tobacco and age-specific prevalence rates of tobacco use (see Appendix 5).

Types of intervention and comparator: Project MYTRI, ATCEP and WNTD focused on the delivery of health education messages related to the harmful effects of tobacco and addressed multiple forms of tobacco use through the use of media, peer and professional education and the use of health education materials. The BSTP provided pharmacotherapy (NRT) in addition to behavioural support in the form of brief advice and encouragement while the WNTD programme offered NRT and one- to-one counselling. Details regarding comparators were poorly described or missing. The comparator for Project MYTRI was delayed intervention. The BSTP had behavioural support without NRT as the comparator. Neither the ATCEP not the WNTD programme reported any details related to an intervention comparator.

Intervention content and delivery: The intervention activities or programmes varied on a number of dimensions, including content, duration and intensity. There was also considerable variation in the theoretical approach that guided the definition of intervention objectives and methods of achieving those objectives. Programme content was diverse and included many different activities and channels, however, similarities between studies were seen. Interventions typically combined strategies (e.g., behavioural and pharmacological) for modifying smoking behaviour in addition to mass media programmes aimed at altering the cultural climate of entire communities (Anantha et al. 1995). Activities were implemented through various methods: local health departments and hospitals, schools and work-sites, other

community and voluntary organisations. Lay community volunteers facilitated intervention delivery in the BSTP and student peer-leaders were used in Project MYTRI. However, the extent to which the community was involved in both theplanning and implementation of the intervention was another source of considerable variation.

Time frame, duration and intensity: With the exception of Anantha et al. (1995 [+]), all of the included studies began in 2003 or later. The longest reported follow-up time was five years (Anantha et al. 1995 [+]) and the shortest follow-up time was oneweek (Croucher et al. 2003b [+]). All of the BSTP studies reported a follow-up time of four weeks or less. The WNTD programme began in 2007 and had a follow-up timeof eight weeks (Mishra et al. 2009 [-]) and Project MYTRI had a two year follow-up. Project MYTRI was implemented with two cohorts of students over two consecutive school years (2004–05 and 2005–06), and subsequently evaluated using three repeated surveys (in 2004, 2005, and 2006). The classroom curriculum for Project MYTRI consisted of seven different classroom sessions of 30-60 minutes each and were delivered over a period of 4-5 months. The ATCEP intervention was implemented in one experimental area which contained 117 villages. The studyperiod for ATCEP was 1986 to 1992. The intervention began shortly after completion of the baseline survey and lasted three years. Intervention components (e.g., discussion groups, printed health education materials) were delivered once per week (See Appendix 5).

4.4 Description of Interventions

All of the studies related to the BSTP focussed on cessation of smokeless tobacco through brief intervention. The BSTP was evaluated by examining the impact of brief advice and NRT on quit rates, adverse events and withdrawal symptoms. The BSTP offered brief encouragement and advice with and without NRT. Acute and/or sub-lingual forms of NRT (gum, lozenge, micro-tab and inhalator), patch therapy and combination NRT were used in five studies (Croucher et al. 2003a [+], 2003b [+]; Croucher et al. 2011a [-], 2011b [+], 2011c [+]). One BSTP-related study included an oral examination component well (Croucher et al. 2003b [+]). The BSTP was delivered by bi-lingual female researchers.

The ATCEP and the WNTD programme focussed on cessation and prevention of tobacco and raising awareness of the harmful effects of tobacco use (Anantha et al.

1995 [+]; Mishra et al. 2009 [-]) among tobacco smokers and chewers. The ATCEP assessed the effect of community-based education through the use of media and interpersonal communication on quit rates, initiation rates and prevalence of tobacco use pre- and post-intervention. ATCEP included printed health education material, audio-visual aids and interpersonal communication (individual and group). Programme contents were delivered by junior and senior health workers. The WNTD programme evaluated tobacco-related knowledge, prevalence of tobacco use and factors responsible for initiation and continuation of tobacco use before programme implementation. The WNTD programme components included health awareness lectures, self-monitoring of tobacco use, focus group discussions, one-to-one counselling and pharmacotherapy. Dental screenings were also included as a programme component. The intervention components were delivered by a team of doctors and counsellors from a local hospital. No post-programme measures were assessed in the WNTD programme.

Project MYTRI focused on the delivery of health education messages to change multiple intrapersonal (e.g., knowledge, skills) and social-environmental (e.g., social norms) factors related to tobacco use among urban Indian youth. The intervention was school-based and consisted of a classroom curriculum, school posters, parent postcards and training of the intervention deliverers. Intervention components were delivered by teachers and student peer leaders.

Project MYTRI, ATCEP and WNTD were entirely Indian in content, context, communication (both textual and pictorial) and delivery. With the exception of the WNTD programme, each of the included studies evaluated and reported intervention effectiveness by measuring the relative impact of intervention components to changes in tobacco use.

Table 4: Table of intervention components

Programme	Reference(s)	Programme components
ATCEP	Anantha et al. 1995;	• Brief advice • Education and On-site Activities • Monitoring • Group Sessions • Individual Sessions
BSTP	Croucher et al. 2003a; Croucher 2003b; Croucher et al. 2011a, 2011b, 2011c ; Pau et al. 2003	• NRT (Nicorette®) • Brief advice • One-to-one/Tailored Counselling • Monitoring (salivary cotinine) • Dental Examination • Individual Sessions
Project MYTRI	Bate et al. 2009; Perry et al. 2008; Perry et al. 2009; Stigler et al. 2006; Stigler et al. 2007; Stigler et al. 2011	• Education and On-site Activities • Monitoring • Group Sessions
WNTD progamme	Mishra et al. 2009	• NRT (Bupropion tablets) • One-to-one/Tailored Counselling • Education and On-site Activities • Monitoring (rapid urinary cotinine) • Dental Examination • Group Sessions • Individual Sessions

4.5 Results

4.5.1 Interventions providing behavioural support or counselling for individuals or groups

Both the BSTP and the WNTD programme offered interventions with behavioural support and pharmacotherapy components (Croucher et al. 2003a [+], 2003b [+]; Croucher et al. 2011a [-], 2011b [+], 2011c [+]; Mishra et al. 2009 [-]; Pau et al. 2003 [+]). Behavioural support was in the form of brief advice and encouragement (BSTP) or one-to-counselling/focus group discussions (WNTD). Brief advice and encouragement was offered to participants by bi-lingual (Sylheti/English) research workers. One-to-one counselling and focus group discussions were delivered to employees by a team of doctors and counsellors from a local hospital (See Appendix 5 for details of BSTP and WNTD tobacco outcomes).

Tobacco use outcomes

The BSTP reported daily paan use (Croucher et al. 2003a [+]; 2003b [+]; Croucher et al. 2011a [-], 2011b [+]; 2011c [+]; Pau et al. 2003 [+]) and the WNTD programme (Mishra et al. 2009 [-]) reported current use of tobacco, prevalence of smokeless tobacco use. For the BSTP, the mean number of paan quid tobacco chewed daily ranged from 9.4 to 13. Croucher et al. 2011c [+] reported the mean number of daily paan (with tobacco) chewed was 9.96 (95% CI= 9.22, 10.70) with a range from 1 to 48. Nearly half (45.7%) of the participants chewed more than 10 paan with tobacco daily followed by 31.3% who chewed 5 to 9 paan with tobacco daily whilst 23.1% chewed fewer than 5 paan with tobacco daily. The mean age for starting paan-with-tobacco use was 20.94 years (95% CI=19.76, 22.12), ranging from 5 to 63 years. Participant age did not predict number of paan with tobacco chewed daily. However, clients who chewed above the median daily paan (with tobacco) were significantly more likely to have started their chewing at an earlier age (19.28 years [95% CI=17.71, 20.85] vs. 22.52 years [95% CI=20.79, 24.25] p= 0.007). Area level of deprivation was not significantly related with frequency of daily paan with tobacco chewing. Croucher et al. 2003a [+] found that the mean number of paan quid with tobacco chewed daily was 10.7 and the average age of starting tobacco chewing was24 years. Ninety-three percent of participants were tobacco chewers alone, while the remaining 7% both smoked and chewed tobacco.

Among the 104 employees included in the WNTD programme, the initial interview findings indicated a tobacco consumption rate of 48% (50 tobacco users), of which seven employees used smoking forms, 33 smokeless forms and 10 used a combination of smoking and smokeless forms. Thirty-two percent of tobacco users reported smokeless tobacco use, of which 14% used chewing tobacco, 6% used a combination of smokeless tobacco products, 4% used betel quid with tobacco, 3% used betel nut, 2% used masher. The remaining products included paan masala (1%), gutkha (1%) and tobacco paste (1%). Thirteen employees (77%) using smoking form of tobacco had Fagerstorm score of zero, and 29 employees (67%) using smokeless forms of tobacco had a score varying from 0 to 5. Fifty-four employees (51.9%) had never used tobacco. There was no difference betweentobacco users and nonusers with respect to age, education, income, religion, duration of service, and the presence or absence of shift duty. The mean age at the initiation of smokeless tobacco use was 27.5 years. Fifteen employees (10.7%), of whom ten (20%) were tobacco users and five (9.26%) were nonusers had at leastone family member, mainly siblings and parents, who used tobacco (Mishra et al. 2009 [-]).

Quit attempts and quit success

Four studies of the BSTP provide details related to quit attempts and success.Croucher et al. (2003a [+]) found that 91% of volunteers completed the 4-week trial. Results showed that 19.5% of completers had stopped tobacco use, of which 22% had received NRT, and 17% received brief advice and encouragement without NRT. The successful members of the NRT group made a significantly greater reduction in their salivary cotinine scores at final review compared to baseline.

Interim results from Croucher et al. (2011a [-]) reported a 54% quit rate among the 229 clients who completed the four-week intervention programme. Self-reported quit success varied between localities (Tower Hamlets=61.7%, Leicester=52.2% and Bradford=26%). Women were more likely than men to make a successful quit attempt. Client age was not related to a successful quit attempt and level of dependency was not related to final quit status. However, clients who experienced a lower mean number of withdrawal symptom or lower mean number of adverse eventsat first follow-up were more likely to make a successful quit attempt.

Interim data from Croucher et al. (2011b [+]) showed that 94% of clients used NRT in their quit attempt. Sixty-two percent reported a successful quit attempt at four weeks.

Unlike Croucher et al. 2011a [-] which found that women were more likely than men to report a successful quit attempt, Croucher et al. 2011b [+] found no association between gender and quit success. However, male clients were more likely to have received combination NRT compared to female clients (p=0.005). Clients with above the mean number of behavioural contacts were more likely to report a quit attempt success (p=0.01). Fewer WS at first follow-up was also significantly associated with a successful quit attempt (p=0.005). Fewer NRT-related AE at first follow-up were significantly associated with a successful quit attempt (p=0.028) whilst those reporting oral pain and discomfort at first follow-up were less likely to make a successful quit attempt (p=0.034).

Croucher et al. (2011c [+]) found that at the end of the four-week intervention, self-reported continuous tobacco abstinence was 58.3%. Independent predictors of a successful cessation attempt were use of NRT (OR=5.38, 95% CI 2.71, 10.70), recruitment through a community centre (OR=1.84, 95% CI 1.01, 3.35), living in a relatively less deprived area (OR=1.98, 95% CI 1.17, 3.32) and chewing fewer paan with tobacco daily (OR=1.84, 95% CI 1.11, 3.05).

Behavioural therapy in the form of focus group discussion (FGD), one-to-one counselling and, in some cases, pharmacotherapy in the form of Bupropion tablets were offered to tobacco users as strategies for quitting tobacco. Seven sessions of FGD were offered to WNTD programme participants. Self-reported tobacco quit rates in the first, second, third, fourth, fifth and sixth follow-up sessions were 30%, 44%, 48%, 46%, 46% and 48% respectively—with an overall quit rate of 40% at the end of the study. Five tobacco users were offered pharmacotherapy from fifth FGD session onwards. One employee quit tobacco while two employees did not comply with the pharmacotherapy because of side effects following the use of Bupropion. The overall quit rate amongst the pharmacotherapy group was 20%. There was no difference in quit rates according to the age group of employees. The quit rates among employees using smokeless forms of tobacco was 51.5% and 20% amongst those using combination of smoking and smokeless forms. Forty-seven percent of the employees who quit tobacco, had attempted quitting in the past. Among the 20 employees who finally quit tobacco, 21% had attempted quitting tobacco once previously, 10% had attempted quitting twice previously, 10% had three previous attempts and one employee had attempted quitting seven times previously. Among the quitters, 53% had never attempted quitting in the past. However, after intense counselling by the tobacco control team they successfully quit tobacco. The tobacco quit rates among

employees with presence of precancerous lesions was 25% and in employees without lesions was 30%. The tobacco quit rate among employees using smokeless tobacco with Fagerstorm score between 0-5 was 48.3%, as compared to 35.7% in employees with Fagerstorm score of more than 5. Oral examination findings correlated with the tobacco quit history and a reduction in the size of lesions and improvement in the oral hygiene was noted amongst employees who quit tobacco(no data provided) (Mishra et al. 2009 [-]).

Relapse and maintenance One employee relapsed between the third and fourth follow-up sessions and two employees relapsed between the fourth and fifth follow- ups after initially quitting. In addition, one employee substituted tobacco chewing withtobacco application (masheri), while one employee with relapse and one who had substituted with another form of tobacco later quit tobacco upon re-counselling duringthe follow-up. The rapid urine cotinine test was performed among all employees at the end of one year of intervention. All employees who had reported as non-users at the beginning of the study had a negative urinary cotinine test result. Among 24 employees who gave a self-report history of tobacco cessation, 20 had negative urinary cotinine test results indicating they were true quitters while four had positive urine cotinine test results. All employees who self-reported continuation of tobacco use tested positive by the rapid urinary cotinine test. The four employees with discrepancy in test results when taken into confidence and enquired again about tobacco usage, gave history of occasional tobacco use. The agreement rate betweenself-reported tobacco history and the urine cotinine test results performed at the end of twelve months was 96% (Mishra et al. 2009 [-]).

Adverse events and withdrawal symptoms

Two studies provided details related to adverse events (AE) and withdrawal symptoms (WS) (Croucher et al. 2011a [-], Croucher et al. 2011b [+]) and three studies reported data related to oral pain (Croucher et al. 2003a [+], 2003b [+]; Croucher et al. 2011b [+]). Reported WSs included anxiety, irritability, restlessness, depression, craving, difficulty concentrating, difficulty sleeping and increasedappetite. AEs included vivid dreams, rash, nausea/vomiting/diarrhoea, sleep disturbance, headache, restlessness, dry mouth, indigestion/heartburn, weakness, hiccups, and oral discomfort/tooth pain/throat irritation.

Croucher et al. (2011b [+]) conducted a pilot study to inform the design of smokeless tobacco cessation support and a retrospective review of the BSTP client database to provide data on quit attempts by smokeless tobacco users. Age, gender and ethnicity were not related to initial withdrawal symptoms (WS), adverse events (AE) or dependency. Clients with below mean number of contacts were more likely to report fewer WS (p=0.02), fewer AE (p=0.006) and lower dependency (p=0.001). Mean WS reduced significantly from 2.1 (at first follow-up) to 0.89 (at final assessment) (p=0.005). Higher dependence was significantly associated with more WS at first follow-up (p=0.031). Mean NRT-related adverse events (AE) reduced from 2.08 at first follow-up to 0.58 at final assessment (p=0.005).

Participants in the WNTD programme reported uneasiness, craving, temptation and constipation as major withdrawal symptoms and that the lack of will power, to be part of a social group emerged as reasons given by non-quitters for continuation of tobacco use. Employees who relapsed after initial quitting stated physical discomfort like constipation as the reasons for relapse. No other data in relation to adverse events or withdrawal symptoms from smokeless tobacco use were reported (Mishraet al. 2009 [-]).

Oral pain: Croucher et al. (2003a [+]) found that oral pain was reported as a barrier to successful oral tobacco cessation by 62% of the volunteers at final review. Croucher et al. (2003b [+]) conducted a survey to assess the oral health of paan usersattending the BSTP. The prevalence of self-reported oral pain was 26.9% at baseline and 51.9% at one-week follow-up. Presence of an oral mucosal lesion (OML) at baseline was a significant predictor of reports of oral pain at the one-week follow-up. Results of stepwise multiple regression analysis confirmed this finding (OR=3.66; 95% CI: 1.06, 12.621; p=0.04). Mean number of daily paan chewed was weakly associated with oral pain. However, the association was not statistically significant (OR=1.05; 95% CI: 0.99, 1.11; p=0.104). The authors concluded that reports of oral pain at follow-up while attending the BSTP correlate with the presence of OMLs at baseline.

Croucher et al. (2011b [+]) reported that 78% of volunteers attending the BSTP reported AEs at first follow-up, most commonly oral pain and discomfort. Although Croucher et al. (2011b [+]) reports oral pain as an AE, it has been noted by the study's author that oral pain was an outcome of an inventory measuring adverse events to NRT use and was measured using an open-ended item 'anything else'

related to barriers to successful intervention. Oral pain was not reported for the WNTD programme.

Psychosocial factors

There was considerable improvement in the knowledge, attitudes and practices related to tobacco use among WNTD participants post-intervention. A comparison of pre- and post-intervention found increases in knowledge regarding harmful forms of tobacco (43.3% vs. 85.0%), cigarette safety (54.8% vs. 85.0%), risk for heart attack (47.2% vs. 67.0%) and availability of professional cessation services (75.0% vs. 98.0%). Statistical significance of the change in knowledge was not reported (Mishra et al. 2009 [-]).

Process and implementation

Program satisfaction Croucher et al. (2011b [+]) assessed client satisfaction related to cessation support for the BSTP. Process (satisfaction) data is reported on a randomly selected sub-sample of 74 clients (15 from Bradford, 35 from Leicester and 24 from Tower Hamlets). The sub-sample of clients reported being either 'satisfied' (36.5%) or 'very satisfied' (63.5%) with the support they had received for their quit attempt. Ninety-seven percent would recommend the service to other smokeless tobacco users and 97% would return to the service for any future quit attempt. Clients were more likely 'very' satisfied if men (p=0.035) and with below mean number of adverse events reported in Week 2 (p=0.016). No other data regarding process or implementation were available for the BSTP.

WNTD employees found FGDs and health awareness lectures very useful. Fifty-four percent of the participants appreciated the program and felt no improvement in the program was required. Some employees suggested introduction of periodic urinary cotinine test instead of a single test at the end, while few suggested that fear about acquiring tobacco-related diseases should be included in the counselling sessions. Majority of the employees appreciated the program and believed that it had helped them to bridge the gap between their thoughts and behaviour and motivated them to stop tobacco use. This, they felt, was the major strength of the program (Mishra et al. 2009 [-]).

Uptake of intervention components Interim BSTP results from Croucher et al. (2011a [-]) indicated that 88% of 248 clients chose nicotine replacement therapy (NRT) and behavioural support as the method of quitting. Of those choosing NRT, 62% used

combination NRT (patch & gum). (Croucher et al. 2011c [+]) found that more than three quarters (78.8%) of BSTP volunteers chose behavioural support and NRT whilethe remainder chose behavioural support alone. For the WNTD programme, tobaccousers were offered behavioural therapy in the form of focus group discussion (FGD) and one-to-one counselling from round two onwards. Among the 50 tobacco users invited for the FGD, 90% participated in the first session, 88% in the second session, 88% in the third session, 66% in the fourth session, 90% in the fifth session, 84% in the sixth session and 86% in the seventh session. The main reason for non- participation was absenteeism on the days of intervention, which was high during fourth session due to festive season. The non-participants were contacted on phone to enquire about their stage of tobacco cessation and remind them about quitting tobacco (Mishra et al. 2009 [-]).

4.5.2 Brief interventions (including brief advice) by health and social care professionals, including dental practitioners and GPs

There is no available data regarding the effect of brief interventions (including brief advice) by health and social care professionals on smokeless tobacco use among South Asians.

4.5.3 Brief interventions (including brief advice) by community members or peers

Project MYTRI is a 2 year, school-based, tobacco education/prevention program. The overall goal of the program was to reduce tobacco use among students in Grades 6 to 9, including cigarette smoking, bidi smoking, and chewing tobacco (e.g., gutkha). The objectives of the program were to change multiple intrapersonal factors (e.g., knowledge, meanings, skills) and social-environmental factors (e.g., social norms) known to be related to tobacco use among urban Indian youth.

Tobacco use outcomes

Three of seven studies which evaluated results from Project MYTRI reported current use of tobacco (Perry et al. 2009 [+]; Stigler et al. 2006 [+]; Stigler et al. 2007 [+]). Perry et al. (2009 [+]) conducted a survey and evaluation of Project MYTRI to assessthe effectiveness of this intervention to reduce tobacco use rates among adolescents

in an urban area of India. There were significant between-group differences in the trajectories of cigarette smoking ($p<0.05$), bidi smoking ($p<0.01$), and any tobacco use ($p<0.04$) over the 2 years of the intervention. Rates of cigarette smoking and bidi smoking, as well as any tobacco use, increased over time in the control group (as would be expected with this age population), the rate of tobacco use in the intervention group actually decreased over time. There were no significant between- group differences in the trajectories of chewing tobacco use ($p>0.10$). Tobacco use increased by 68% in the control group and decreased by 17% in the intervention group over the 2 years.

Stigler et al. (2006 [+]) conducted a survey of Project MYTRI to assess differences in tobacco use among urban Indian 6th graders and 8th graders. Mixed-effects regression models were used to examine the relationship between fifteen psychosocial risk factors and current use of any tobacco, by grade. Current (past 30 day) use of any tobacco, including chewing tobacco (for example, gutkha), bidis, or cigarettes) was assessed. Among 6th grade students, all of the psychosocial factors were inversely associated with increased use of tobacco except for reasons students may have to not use tobacco and awareness about public policies related to tobacco control ($p>0.05$). The same two factors were also not associated with increased tobacco use in 8th grade ($p>0.05$). Refusal skills self-efficacy was not significantly related to tobacco use in the older cohort, nor was, exposure to tobacco advertising ($p>0.05$). Among 8th grade students, five factors were most strongly related toincreased use of tobacco. These factors included: social susceptibility to chewing tobacco, social susceptibility to smoking bidis or cigarettes, support for policies for tobacco control, normative expectations of tobacco use, and perceived prevalence of chewing tobacco ($p<0.01$). Most notably, exposure to tobacco advertising was strongly associated with increased tobacco use among the 6th graders ($p<0.01$)— though, as noted above, it was not at all for 8th graders ($p>0.05$).

Stigler et al. (2007 [+]) reported no differences between intervention and control groups in baseline rates of tobacco use. After 1 year of implementation, no significant differences in actual tobacco use were observed. However, the prevalence of tobacco use decreased in both conditions over time.

Stigler et al. (2011 [+]) conducted a mediation analysis to assess the impact of changes in knowledge, attitudes and beliefs on tobacco use among Indian youth. When statistically significant mediators (i.e., variables associated with intervention

outcomes) from single-mediator models were added to multiple-mediator models,only reasons to use tobacco and normative beliefs remained statistically significantfor tobacco use behaviours, accounting for 41% and 22% of the intervention's total effect, respectively. No other data regarding tobacco use was provided.

Quit attempts and quit success

There are no available data regarding quit attempts or quit success for Project MYTRI participants.

Adverse events and withdrawal symptoms

There are no available data regarding adverse events or withdrawal symptoms for Project MYTRI participants.

Psychosocial factors

Intentions to use tobacco Bate et al. (2009 [+]) used mediation analysis to investigate whether Project MYTRI altered the psychosocial risk factors as intended, and whether the changes in psychosocial risk factors were, in turn, responsible for altering students' tobacco-use intentions. Results indicated that the psychosocial risk factors Knowledge of Health Effects, Normative Beliefs, Reasons to Use Tobacco, and Perceived Prevalence were significant mediators between the intervention activities and students' tobacco use intentions. However, Beliefs about Social Consequences, Normative Expectations, Self-Efficacy in Refusal Skills, Support for Tobacco Control Policy, Social Susceptibility to Chewing and Social Susceptibility to Smoking where not affected by the intervention. For multiple mediator models, significant mediating psychosocial risk factors for Intentions to Chew included: Knowledge of Health Effects, Normative Beliefs, Reasons to Use Tobacco and Perceived Prevalence of Chewing. Evidence of inconsistent mediation was observed for the Perceived Prevalence.

Perry et al. (2009 [+]) found that there were significant differences in the rates of growth of students' intentions to chew tobacco ($p<0.03$) and to smoke ($p<0.01$) over time, with the intervention students decreasing their intentions more so than the control group. Intentions to smoke increased by 5% in the control group and decreased by 11% in the intervention group. Intentions to chew tobacco decreasedby 12% in the control group and by 28% in the intervention group. Furthermore, there were between-group differences with respect to knowledge of the health effectsof tobacco use, reasons to use and not use tobacco, perceived prevalence of

chewing tobacco use, perceived prevalence of smoking, normative beliefs regarding tobacco use, advocacy skills self-efficacy, knowledge of tobacco-control policies, and social susceptibility to chewing tobacco use (all: $p<0.05$).

Stigler et al. (2007 [+]) investigated whether Project MYTRI altered the psychosocial risk factors as intended, and whether the changes in psychosocial risk factors were, in turn, responsible for altering students' tobacco-use intentions. A test of the changes in risk factors for tobacco use between baseline and intermediate surveys revealed that fewer students in the intervention condition reported having intentionsto smoke tobacco in the next year ($p=0.02$) or chew tobacco when they reached college ($p<0.01$). After only 1 year of implementation, students in the intervention condition had fewer intentions to smoke tobacco in the next year ($p=0.02$) and chew tobacco as they reached college age ($p<0.01$). Marginally significant differences werenoted in their intentions to smoke in college ($p=0.08$) or as an adult ($p=0.08$), as well as the intentions to chew tobacco as an adult ($p=0.07$).

Stigler et al. (2011 [+]) conducted a mediation analysis of Project MYTRI. Specifically, this study examines how the programme achieved its effects in regards to reducing students' tobacco use intentions. The results indicate that the intervention had a consistent, positive effect on knowledge of health effects, reasons to use, reasons not to use, advocacy skills efficacy, normative beliefs and beliefs about social consequences, and were consistent mediators for intentions to use tobacco. Inthe multiple mediator models for tobacco use intentions, only normative beliefs remained statistically significant, accounting for 95% of the total intervention effect.

Process and implementation

Two studies evaluated the process of implementation of Project MYTRI (Goenka et al. 2010 [+]; Perry et al. 2008 [+]). Goenka et al. (2010 [+]) presented results based on participants from sixteen intervention schools, eight in Delhi and eight in Chennai. Four schools in each city were private and four were state-funded or government schools. The students in the private schools were from higher income backgrounds. All students (n = 5564; 2823 in Delhi and 2741 in Chennai) of the 6th and 8th grades in these schools participated in the intervention and elected their own peer leaders. Student peer leaders (n=781) and teachers (n=125) delivered the intervention. Results indicated that all classroom sessions, posters, postcards and inter-school components were fully implemented in thirteen of the sixteen schools with partial implementation in the remaining three schools. The average delivery (the quantity

and the rigor of implementation, of the intended intervention units, that are actually delivered to the participants) was 71.3% and the average exposure (the extent to which participants are satisfied, understand, actively engage with, interact with, are receptive to and absorb/use material or recommended resources) was 72.5%. Though, the school-wise scores of the delivery varied widely from 39-95%, thescores of exposure showed lesser variability, they ranged from 58 to 79%.The average reach score for the delivery of the intervention was 64.8% (69.9% for attendance at the classroom sessions, 65.8% for inter-school event and 58.7% for the proportion of signed, parental postcard stubs returned). The proportion of teachers trained in a school correlated with better implementation of objectives ($r=0.58$, $p<0.02$) and superior peer leaders–student communications ($r=0.75$, $p<0.001$). It was also of greater benefit in lowering the susceptibility to chewing tobacco ($r=0.53$, $p<0.05$). Furthermore, the communication between students and peer leaders ($r=0.66$, $p<0.005$) and higher proportion of students participating in the classroom discussions ($r=0.70$, $p<0.005$) correlated with better outcomes. Schools with a higher proportion of teachers trained also had better communication between the students and peer leaders.

Perry et al. (2008 [+]) described the process related to the selection of schools, training of staff, teachers and peer-leaders, as well as, the implementation of the classroom curricula. A total of 93 schools were contacted to be part of the study. Meetings were arranged with 68 of the schools (73.1%), and 32 schools signed the cooperative agreement (47%). Reasons for non-participation included: not wanting to sign the cooperative agreement, lack of time and teaching staff to conduct extracurricular activities, apprehension that the activities would encroach on academic time, and the perception that tobacco use was not a current problem in their schools. For the 1st year of implementation, 10 staff, 153 teachers, and 678 peer leaders were trained to conduct the MYTRI intervention in the 16 intervention schools. Teachers ranked the overall appropriateness of the intervention components high, with teachers from government schools ranking the components more highly than teachers from private schools; the mean scores were 6.9 and 6.4, respectively (scale 1-7). The authors concluded that, to date, Project MYTRI has been quite successful, reporting very high survey response rates, teacher ratings of the program's appropriateness, program completion rates, and student participation.

Stigler et al. (2007 [+]) noted that Project MYTRI program activities were implemented in intervention schools with good adherence and high participation

rates. School posters and parent postcards—designed to complement these activities—were distributed to all intervention schools and students, respectively. Seventy-four percent of postcards were delivered home by students to their parents. At the end of the classroom activities, the large inter-school event in each city drew more than 3,500 people, representing 67% of the cohort of 6th and 8th graders. Observations were conducted at least once in each classroom to determine the adherence with which classroom activities were implemented and 73% of them were delivered as prescribed.

4.5.4 Local community-based initiatives to raise awareness of the harm caused by smokeless tobacco and to encourage the uptake of cessation services by people who use smokeless tobacco

The main objectives of the ATCEP study (Anantha et al. 1995 [+]) were to prevent individuals from taking up the tobacco habit among those who currently did not smoke or chew tobacco, and to stop tobacco use in those who currently usedtobacco. The methods of health education included the distribution of handbills and other printed material, the use of audio-visual materials (films, exhibits) and interpersonal communication regarding the harmful effects of tobacco. Health education messages were delivered to individuals, small groups and large groups within the selected intervention communities. Outcome measures of the ATCEPincluded prevalence of tobacco use, quit rates and initiation of tobacco use.

Tobacco use outcomes

Prevalence rates Baseline prevalence rates in the experimental area were higher in both males (30.9% vs. 27.0 and 29.1%) and females (38.5% vs. 28.7% and 30.4%) compared with that in the two control areas. Females showed a higher prevalence of tobacco use compared with males in experimental (38.5% vs. 30.9%) and control areas (28.7% vs. 27.0% in control area I and 30.4% vs. 29.1% in control area II). Examination of the prevalence rates after stratifying according to villages did notshow a difference. Baseline prevalence of type of tobacco showed some variation— with 16.4% of males in the experimental area reported tobacco chewing compared with 7.7% and 8.4% of males who reported tobacco chewing in control area I and control area II, respectively. Post-intervention, results showed a decline in rates from baseline to final assessment—with a 10.2% decrease for males in the experimental area compared to 2.1% and 0.5% decrease in the control areas ($p<0.0001$). For females, there was a 16.3% reduction in the experimental area compared to 2.9%

and 0.6% in the control areas (p<0.0001). Post-intervention, there was a 5.6% reduction in the percentage of males who reported tobacco chewing compared to 1.2% and 0% reduction in the control areas (p<0.0001).

Initiation rates Baseline initiation rates of tobacco use among males werecomparable between the experimental and control areas. However, the rate among females was different. Initiation rates of tobacco use in the experimental area showeda statistically significant decline in males (p<0.01) and females (p=0.005) betweenthe baseline and the first follow-up surveys. At the final assessment, males in control area I did not show a statistically significant decline in the initiation rate (p=0.16). Initiation rates of tobacco chewing and smoking were also compared. At the final assessment, the initiation rate of chewing among males was 0.2% and that of smoking 0.1% in the experimental area. In control area I, the initiation rate of chewingwas 0.1% compared with 0.3% for smoking. In control area II, the initiation rates were0.4% and 0.9% for chewing and smoking respectively.

Quit attempts and success

Results indicated that the numbers and rate of persons who had quit the habit of tobacco at the time of first repeat survey was much higher in the experimental area compared with the control areas (in males, 26.5% in experimental area 3.2% and 1.1% in control area I and control area II, respectively; and in females, 40.7% in experimental area 2.4% and 0.2% in control area I and control area II, respectively). By the end of follow-up, results showed a decrease in the quitters' rate by 4.0% in females and no change in rate for males in the experimental area. The influence of age on quitting the habit was examined and found that there was no variation in quit rates by age group. Furthermore, no significant differences were found between quitters and non-quitters and the mean duration of the tobacco habit (Anantha et al. 1995 [+]). The quit rate among male chewers also showed a decrease over time as well—with the percentage of quitter declining from 32.0% to 30.2% between the first follow-up survey and the final survey.

Adverse events and withdrawal symptoms

There are no available data regarding adverse events or withdrawal symptoms for the ATCEP.

Psychosocial factors

There are no available data regarding psychosocial factors for the ATCEP.

Process and implementation

Participants in the ATCEP study were exposed to one of three types of health communication methods (printed, audio-visual and inter-personal communication). There was no marked difference in the proportion of quitters exposed to reading material and inter-personal communication compared to the proportion non-quitters who were exposed to these materials. However, with regard to the audio-visual forms of education, during the first follow-up, 68.6% of quitters were exposed to the films on chewing and smoking compared with 57% of non-quitters. During the final assessment, 95.7% of quitters had viewed the films compared with 90% of non- quitters (Anantha et al. 1995 [+]).

4.5.5 Interventions to raise awareness and knowledge among health and social care professionals about smokeless tobacco use

There are no available data regarding the effect of interventions raise awareness and knowledge among health and social care professionals about smokeless tobacco use among South Asians.

5. Question 2: Contextual review

The findings in this section of the review will address contextual factors associated with smokeless tobacco use among South Asians, as well as views of health practitioners. Evidence from OECD countries (Organisation for Economic Co- operation and Development) only was examined to allow for comparability to UK populations. Fourteen papers were systematically selected from a database of 2968 records considered to be relevant to contextual factors around smokeless tobacco among South Asians. Eleven papers were identified from a formalised and systematic search strategy (Ahmed et al. 1997; Bedi & Gilthorpe 1995; Croucher & Choudhury 2007; Croucher et al. 2002; Croucher et al. 2007; Longman et al. 2010; Nathan 2010; Pearson et al. 1999; Prabhu et al. 2001; Summers et al. 1994;Vora et al. 2000), while the remaining three papers (Csikar et al. n.d; HDA 2000; Rees 2007),which consisted of grey literature and unpublished studies, were provided by the NICE team and subject experts.

5.1 Study quality

The quality of included studies for the contextual review were assessed by one reviewer and verified by another reviewer using the tool for associational and correlational studies, with the exception of two studies, one by Croucher & Choudhury (2007) and one by HDA (2000), which were assessed using the qualitative tool in the NICE methods manual (2009). Please refer to appendix 4 to view the results of the quality assessment exercise. These studies were judged to be of reasonable quality (+), with some of the quality criteria being fulfilled, and any unfulfilled criteria are unlikely to alter the conclusions (NICE methods manual 2008). Nine cross-sectional quantitative studies were graded as reasonable quality (+) (Ahmed et al. 1997; Bedi & Gilthorpe 1995; Csikar et al. n.d; Longman et al. 2010; Nathan 2010; Pearson et al. 1999; Prabhu et al. 2001 Summers et al. 1994; Vora et al. 2000). These studies adequately explained participant selection, selection of study variables, outcomes, and results, but varied on internal validity since some studies had minor flaws in design and did not adjust for confounders (Bedi & Gilthorpe 1995; Csikar et al. n.d; Longman et al. 2010 Nathan 2010; Summers et al. 1994). Two papers by Croucher et al. (2002 and 2007) were graded as good quality (++), as they fulfilled many of the criteria in terms of describing the population, selection of study variables, appropriate outcomes, and study validity. The HDA report utilised a qualitative approach, while the Rees report focused on survey data and existing studies. One included report by Rees (2007) was not quality assessed

using NICE tools since no appropriate tool existed for reports that were not specifically primary research; however, the two reviewers judged this report to be of reasonable quality based on reporting of aims and objectives, findings, conclusions.

5.2 Included study typology

The majority of the studies utilised a cross-sectional questionnaire tool that was culturally appropriate for South Asian populations (Ahmed et al. 1997; Bedi & Gilthorpe 1995; Croucher et al. 2002; Croucher et al. 2007; Csikar et al. n.d; Nathan 2010; Pearson et al. 1999; Prabhu et al. 2001; Summers et al. 1994; Vora et al. 2000).Two papers undertook qualitative research to investigate the context of tobacco use among South Asians (Croucher & Choudhury 2007 ; HDA 2000). Access to smokeless tobacco was investigated through a land survey of outlets of purchase by Longman et al. (2010). A report briefing by Rees 2007 provided information about tobacco use with some relevant information about South Asians and smokeless tobacco.

The United Kingdom was the setting for all included studies, with a specific focus on London. Tower Hamlets (Ahmed et al. 1997; Croucher & Choudhury 2007; Croucher et al. 2002; Croucher et al. 2007; Pearson et al. 1999), East London (Prabhu et al. 2001), and Harrow (Nathan 2010) were chosen as research sites since these areas were known to researchers to contain a high proportion of the UK's South Asian population; However, Birmingham (Bedi & Gilthorpe 1995), and Leicester (Rees 2007;Vora et al. 2000) were also areas with a high proportion of South Asian communities. The land survey study by Longman et al. (2010) focused on both Tower Hamlets and Leicester since both areas contained a substantial number of retail outlets selling smokeless tobacco within South Asian communities. Finally, the HDA report takes a national examination of the tobacco problem within minority groups (including South Asian) throughout the UK.

In terms of study objectives 4 of the 14 studies focused on prevalence of smokeless tobacco use and also examined knowledge and risk of smokeless tobacco useamong South Asians (Ahmed et al. 1997; Bedi & Gilthorpe 1995; Croucher et al. 2002; Vora et al. 2000). Predictors and prevalence of smokeless tobacco use was discussed in four papers (Croucher et al. 2007; Prabhu et al. 2001; Rees 2007; Summers et al. 1994). Croucher & Choudhury (2007), a qualitative paper, aimed to investigate tobacco behaviour of UK Bangladeshi men. Dental hygiene, dental care, and views of dental health professional were the focus of three studies (Nathan 2010;

Pearson et al. 1999), one of which was unpublished evidence provided by an expert in this field (Csikar et al. n.d). The objective of the HDA (2000) report was toascertain appropriate methods of intervention for reduction of tobacco use among black and other minority Ethnic groups. Research by Longman et al. (2010) provided an audit of observed retail practices with respect to smokeless tobacco products.

5.3 Participant characteristics

The number of participants included in the 14 studies is 3056. The majority of data focuses on responses from South Asian community members; however, data from dental and other health professionals was expressed in three papers (n=426 across all studies) (Csikar et al. n.d; HDA 2000; Nathan 2010). Data was collected and represented by both genders in the majority of studies (Ahmed et al. 1997; Bedi & Gilthorpe 1995; Csikar et al. n.d; HDA 2000; Nathan 2010; Pearson et al. 1999; Prabhu et al. 2001; Rees 2007), as well as samples of 100% men (Croucher & Choudhury 2007; Croucher et al. 2007; Vora et al. 2000), and 100% women in some studies (Croucher et al. 2002; Summers et al. 1994). While many papers targeted South Asians, Bangladeshi populations were well represented in this field of research(Ahmed et al. 1997; Bedi & Gilthorpe 1995; Croucher & Choudhury 2007; Croucher et al. 2002; Croucher et al. 2007; Pearson et al. 1999; Prabhu et al. 2001; Summers et al. 1994). The most popular method of study recruitment was through GP practices, places of worship, workplaces, cultural centres and colleges (Ahmed et al. 1997; Croucher & Choudhury 2007; HDA 2000; Pearson et al. 1999; Prabhu et al. 2001; Summers et al. 1994; Vora et al. 2000). Electoral ward and registries and census data were also used in four studies (Bedi & Gilthorpe 1995; Croucher et al. 2002; Croucher et al. 2007; Longman et al. 2010).

5.4 Characteristics of smokeless tobacco users

The Leicester Lifestyle Survey completed in 2002 found that 8% of the South Asian population used smokeless tobacco products (Rees 2007). According to research by Croucher et al. (2007), 36% of Bangladeshi men sampled within the Tower Hamlets area indicated they were tobacco smokers alone, while 8% were tobacco chewers alone; however, combining tobacco chewers alone with concurrent tobacco users indicated that 30% were tobacco chewers. Research by Vora et al. (2000) investigated tobacco and alcohol use among first and second generation South Asian men in Leicester and found that 21% Hindus, 0% of Sikhs, 5% of Muslims, and 5% ofJains of first generation men used betel quid, along with 3% Hindus, 0% of Sikhs, 0%

of Muslims, and 14% of Jains of second generation used betel quid with or without tobacco. Nearly similar levels of betel quid use on a daily basis was noted for Bangladeshi men (92%) and females (96%) living in Birmingham (Bedi & Gilthorpe 1995). Pearson et al. (1999) found 78% of their Tower Hamlets mixed gender sample chewed paan, and tobacco was added in 52% of the cases, and 32% (51/158) were light users (1-3 daily), and 11% (18) chewed >8 per day. A range of one to five quids were consumed daily by 37% of the mixed gender Bangladeshi sample. According to Croucher et al. (2002), 48.5% (95% CI 42.01–54.98) of their female sample used smokeless tobacco. According to Ahmed et al. (1997), who conducted a study of mixed genders in Tower Hamlets, the prevalence of betel quid chewing was over 80% with no gender difference. Tobacco was added to paan by more women (43% n=32) than men (29% n=19) (p=0.09).

Prabhu et al. (2001) found similar betel quid use between genders in East London with 28% of all South Asian adolescences sampled using betel quid, with 12% (7) adding tobacco to their quids (respondents who engaged in this habit were over 16 years of age). Just over half (52%) the youth were frequently using betel quid and nearly all (97%) were chewing at least every month. Many of the youth (81%, 47) chewed betel quid with their parents present. This finding was echoed in Birmingham study with a sample of Bangladeshi origin indicating that 81% of women added tobacco to their quids, while only 37% of men added tobacco ($p<0.001$) (Bedi & Gilthorpe 1995), and a greater proportion of women chewing more than men was also cited in Pearson et al. (1999). Females were more likely to add tobacco to their pans than males ($p< 0.01$) (Pearsons et al. 1999). According to a study of first generation Bangladeshi women, paan was used by 95% (282/296) of women, and 62% (174/296) of paan users added leaf tobacco, and as a component of zarda in 27% (75/296) of participants (Summers et al. 1994).

5.5 Social acceptability

According to qualitative research by Croucher & Choudhury (2007), chewing smokeless tobacco is traditionally and culturally more appropriate for the female gender among South Asian communities. Smoking is not very common among South Asian women and is more socially and culturally appropriate in men, with over a third of the Birmingham based sample accepting chewing and smoking habits for men (Bedi & Gilthorpe 1995). Females appeared to be more accepting of their own chewing habits, while men did not, and there was a general consensus that children should not be using betel quid (Ahmed et al 1997).

5.6 Age and location of the onset of smokeless tobacco and chewing products

According to a report by the HDA (2000), the use of smokeless tobacco products was more prevalent among older participants; however, younger UK born South Asians are being drawn into the habit. The age of first use was varied, and some started chewing habits among their families as a pre-teen. This finding is echoed among a mixed gender study of 140 respondents conducted by Ahmed et al. (1997) in the Tower Hamlets community within London indicating that 75% of smokeless tobacco users started in Bangladesh, but 25% (27/109) of both sexes started chewing paan inLondon and were younger (average age 34 years) than those who started in Bangladesh (average age 44 years). According to Pearson et al. (1999), the mean age of onset was 20 years old, but some were starting chewing as young as 6 years of age and as late as 56 years of age. By the age of 17 years 50% were chewing paan, with more males commencing chewing paan by 15 years of age than females ($p < 0.05$). Similarly, Prabhu et al. (2001) found that median age of first chewing was as early as 9 years old with the majority (86%) starting their chewing habits while living in London. Once again, this finding is also stated in the work of Summers et al. (1994) that indicated that 18% (51/295) of the study's Yorkshire samples were chewing by 10 years of age with a mean onset of 17 years.

5.7 Predictors of smokeless tobacco use

According to a cross-sectional survey and interviews with Bangladeshi women in Tower Hamlets by Croucher et al. (2002), women who used smokeless tobacco were significantly older, had used ST for a longer period, and were more likely to cite habit as a reason for chewing, and were also more likely to have their first paan after waking. Similarly, a study of first generation Bangladeshi women, found that participants who consumed more paans daily were significantly older, less literate, had fewer years of formal education, and were more likely to believe that smokeless tobacco was a beneficial habit (Summer et al. 1994). Croucher et al. (2007) examined Bangladeshi males who were smokers and/or smokeless tobacco users in Tower Hamlet and found smokeless tobacco users to be older, but also found that chewers were more likely to have had no formal education, rate their health as average or poor, have increased chronic illness episodes, and report current oral pain. More specifically, Croucher et al. (2007) found that tobacco chewers had the lowest social capital score, and a high proportion of chewers (83%) had a wife that

also used smokeless tobacco. Paan use appeared to be more likely among South Asian females than males who were lighter users ($p < 0.001$) (Ahmed at el. 1997). Also, In Pearson et al. (1999), which was set in Tower Hamlets, only 6% of the first generation Bangladeshi sample had never chewed paan. In a study by Prabhu et al. (2001) which examined predictors of paan use among east London adolescents and reported that those youth who used paan were more likely to think it tasted good, had parents with lower educational attainment, and expressed less negative attitudes to harmful effects of uses on dental appearance and health/ oral cancer.

5.8 Reasons for chewing

5.8.1 Social, traditional, habitual

Within the South Asian communities of the UK, there appears to be a deep rooted desire to continue traditions and practices of native countries among Indian, Pakistan and Bangladesh, especially among older people. Chewing tobacco can be seen as a traditional ritual of sharing and using smokeless tobacco is the backdrop for many social occasions and this practice is passed down through the generations (HDA 2000). According to Rees (2007) smokeless tobacco is an ancient tradition, maintained in the UK, and holds a central position within South Asian cultural practice even among third generations. It serves religious and cultural significance, and can be found within a variety of social settings such as weddings, fairs, holidays and other important events. According to local community workers in South Asian communities, paan is used as a social welcoming tool, to maintain cultural solidarity, as well as preserve heritage, and smokeless products are more firmly part of South Asian heritage when compared with cigarettes (Rees 2007). The presence of these products at social events and links of the product to tradition could be considered a reason why some people use smokeless tobacco; however, some studies have indicated that it is simply a habit and part of a daily routine for some (Croucher et al. 2002; Summers et al. 1994). In Croucher et al 2002, 61% (63/103) chewed paan as ahabit. According to research by Bedi & Gilthorpe (1995) participants from Birmingham's South Asian community suggested they took up the habit of chewing since many of their peers also used paan, although more males than females indicated they liked the taste of the products ($p<0.001$). What can start off as a simple reason for chewing as indicated above, could lead to an addiction to smokeless tobacco as noted as a reason for using in 14% of Tower Hamlets residents sampled (Pearson et al. 1999).

5.8.2 Mental health, physical health, appearance

According to research cited in the HDA report (2000), reasons for chewing ranged from using products in times of stress or boredom or simply to relax and ease tension. Traditional health messages and prior held belief about the health benefits may confuse users and lead them to chew for health reasons. This corresponds to work by Rees (2007) that suggests that traditional Hindu messages can lead to chewing habits since it is believed that paan aids digestion, freshens the breath and strengthens the heart. For example, research by Summer et al. (1994) indicated that 22% of the sample found chewing pleasant and refreshing, while 12% believed chewing had positive health benefits or could aid in digestion (11%), oral hygiene (20%), or help with pain (6%), as well as serve to make lips more attractive. Similarly,research by Croucher et al. (2002), suggested that Bangladeshi women sampled believed it was good for their teeth (22.3%, 23/103), and 12.6% (13/103) found it refreshing. Additionally, Pearson et al. (1999) found perceptions of paan being useful for dental pain management, a digestion and refreshment aid.

5.9 Knowledge of health effects

The HDA (2000) conducted focus groups and found that there was a lack of discussion around the relationship between paan and health risks, suggesting participants had very little understanding of the effects of paan chewing on their health. Cultural traditions overshadowed thoughts of perceived health risks, and participants (especially older Bangladeshis) believed chewing paan was an ancient tradition that had little effect on health. Although some concerns over paan use and complications such as mouth ulcers, cancer of the palette and dental problems were noted in the report (HDA 2000). The problems with paan use are significant since many South Asians chew as an aid to oral hygiene and to mask oral pain, but this is problematic as many people do no visit a dentist to discuss paan use and their healthsymptoms (Rees 2007).

In work by Croucher et al (2002), 10.8% (10/93) of Bangladeshi respondents believed chewing was good for your health, while the remaining 89% (83/93) believed it was bad for health. In contrast, Summers et al. (1994) found that 62% of first generation Bangladeshi women thought chewing was good for their health, while only 20% believed it was negative for health, 13% neither good or bad, and 5% did not know.

In research by Ahmed et al. (1997), knowledge of smoking health risks was far more prominent than the health risks of betel quid use. This being the case, 24% (15) of men and 36% (26) of women linked betel quid and mouth cancer ($\chi 2 = 82.4$, df = 1, $p < 0.001$), and nearly half (men 48% n=30) of and (women 59% n=43) believed paan chewing could cause dental problems. In a study with youth, 36% (73) believed paan was a risk factor for cancer (Prabhu et al. 2001. In research by Pearson et al. (1999), knowledge of health effects of paan was not widespread as 23% believed it was good for health and 43% did not know that chewing paan was linked to negative health consequences. Females were less aware of the health risks (49% of females and 38% of males were unaware of the risks). Of those subjects who believed paan was bad for health, mouth and stomach problems, and diabetes were noted as some of the health risks. Heavier daily paan users (>8 paans) were more likely to believe that paan was good for health when compared to those who chewed less than 8 paans per day ($p < 0.001$). In a study by Vora, nearly 50% first generation Asian males were aware of oral cancer, but this was slightly lower among Sikhs (17%) ($\chi 2$, $p<0.001$). More second generations participants heard of oral cancer, especially the second generation Sikhs (75% of Jains had heard of oral cancer, 43% of Muslims, and 48% Sikhs) ($\chi 2$, $p<0.1$). Smoking and chewing were cited as risk factors for oral cancer by 30% of Hindu, Muslim and Jain males. Prevention of oral cancer was perceived by first and generations as possible by 30% of the sample if one stops using tobacco and practises good oral hygiene; however, a larger proportion of second generation Sikhs provided more complete responses than their elders to questions around oral cancer prevention ($\chi 2$, $p<0.01$).

5.10 Quitting smokeless tobacco

According to survey data from Croucher et al. (2002), 72% (66/92) of Bangladeshi women found it difficult to go without tobacco for a day, and 28% (26/92) indicated they could easily not use tobacco for a single day. This is contrasted with the high proportion of women who would like to quit (80%, 74/92) and indicated that they would strongly (67% 62/92) or moderately (20%, 18/92) desired to give up tobacco use. The intention to quit in the same sample was strong (46%, 47/103), moderate (33%, 34/103), and 21% (22/103) indicated they did not intend to quit. In a study of chewers and smokers, 57% of concurrent chewers and smokers (CCT), and 54% of chewers alone wanted to give up chewing tobacco. Many people in the sample had attempted to quit their tobacco habits at some point (67% of CCT, 86% of chewers). Also, 25% of CCT and 35% chewers indicated they would find it easy to go without

tobacco (Croucher et al. 2007). In a study of Bangaldeshi youth, 38% (n=21) contemplated giving up paan of whom 90% (19/21) had decided to give up; however, only 26% (5/19) had managed to quit paan use.

According to research by Summers et al. (1994) those who chewed less than 10 quids per day were more likely to quit their chewing habit when compared to those who chewed more ($p < 0.001$). Also, 39% of those surveyed would stop using betel quid if advised by a medical professional. In a study by Pearson et al (1999), it appeared that more men (25%) than women (5%) had given up paan ($p < 0.01$). Thisis contrasted with findings from a survey that indicated that 9% (8) of males and 4%
(4) females had given up their habit, but there was no clear reason given for why these individuals decided to quit (Ahmed et al. 1997). Furthermore, some younger generations avoided smokeless tobacco altogether since it may mark the teeth and lips, and these individuals would also discourage their families from using these products and offer cigarettes as a substitute (HDA 2000).

5.11 Accessibility of chewing tobacco

Smokeless tobacco is a widely accessible product in many South Asian communities within the UK, and it appears to be available to all members of the family. Findings from Prabhu et al. (2001) indicated that 81% (47) of teenagers who chewed betel quid acquired their quids at home. According to Bedi & Gilthorpe (1995), male heads of household were the main product purchasers of betel quid that was intended for family use ($p<0.001$), and females rarely purchased their own products. Research by Rees (2007) suggested that paan is easily available in Asian shops within the UKand few products comply with current legislation. Also noted in the report was the finding that the market trading for smokeless tobacco products (including Gutkha) aresteadily on the increase since 1997 and males between 20 and 60 are the primary clients, although women purchasers are on the rise (Rees 2007).

According to a land survey of smokeless tobacco outlets in the UK, Leicester and Tower Hamlets appeared to have the highest concentration of premises that sold smokeless tobacco products; however, chewing tobacco outlets were found in most wards sampled, and were easily accessible (Longman et al. 2010). This corresponds to a report by Rees (2007) suggesting that Leicester is a hot spot for legal and illegal smokeless tobacco products that are targeted at South Asians. Research by Longman et al. (2010) revealed outlets for purchase included supermarkets, news agents, and music and book shops. The land survey revealed that 98 products were

purchased by researchers with an average price of £1.82. This corresponds toresearch from the Rees (2007) report which indicated that products are available to purchase from as little as 20p to £10, and very few traders displayed age restriction notices, sold products with listings in English, and traders had little specific knowledge of health risks of smokeless tobacco use.

5.12 Smokeless tobacco as a substitute for cigarettes

In a qualitative study by Croucher & Choudhury (2007) younger Bangladeshi men indicated that using paan was a way to obtain tobacco without smoking cigarettes, even though smokeless tobacco was associated with the female gender. These younger male participants used paan as a nicotine replacement for cigarettes in smoking cessation attempts, although some participants recognised that this method might help in quitting smoking, but nicotine addiction would still be present, and stopping chewing might prove to be difficult.

5.13 Views of dental professionals

Dentists can provide first line contact with users of smokeless tobacco within the South Asian community; however, according to research by Nathan (2010), 33% (27/83) of dentists were almost twice more likely to neglect to offer areca cessation topatients than to neglect to provide tobacco cessation counselling (17%, 14/83). In total 67% (57) of dentists provided areca nut counselling. A reason for this cited in the article was lack of awareness of the issues facing users and a lack of understanding of the materials and support needed to counsel patients in areca cessation. All of the dentists were aware of the risks of tobacco use, and that theyhad some patients with an areca habit. They reported that these patients were aware of cancer and tobacco risks.

According to unpublished research by Csikar et al. (n.d), 27% (99/372) of dental practitioners in Yorkshire were aware that their patients were using smokeless tobacco. According to Csikar et al, 156 dentists out of 372 were aware of oral health impacts caused by smokeless; however, only half believed (78/152) that it was a significant problem for their patients. Practitioners from Bradford (approx. 63%) and Kirkless (approx. 53%) had a greater proportion of professionals who believed chewing habits are problematic; however this was not the case for respondents from Leeds since this group had a greater proportion of practitioners who did not perceive smokeless tobacco as a significant issue. In the survey, questions on caseload revealed that 9% (32) of practitioners reported that 3-20% of patients were

smokeless tobacco users, with a higher proportion of Bradford practitioners claiming to have smokeless tobacco users as patients when compared to other West Yorkshire regions ($p<0.05$).

Resources for smokeless tobacco were cited as being needed in order to help support patients. According to the Csikar et al. (n.d) survey, 75% (279/372) ofpractitioners indicated that would like to have access to smokeless tobacco resources, and 32% (90) suggested a simple guide that would outline how to talk to patients about smokeless tobacco would be the most helpful, 30% (84) wanted resources for waiting room, 22% (62) wanted assistance with oral cancer detection, and 15% (43) wanted training on smokeless tobacco. This corresponds to Nathan (2010) indicating that dentists believed that they had a lack of information on areca cessation, counselling, and how these issues are relevant for their patients. Dentists indicated that many of their patients are in need, but they do not feel prepared to provide counselling, and this was in stark contrast with positive views of the resources and support available for smoking cessation support and resources. Also, there was a significant difference in the ethnicity of dentists offering support with 75%of Asian/African dentist more likely to provide support than white dentists (43%) ($p<0.006$).

Aside from dentists neglecting to offer cessation support or requiring additional resources, there appears to be a language barrier between South Asian clients and practitioners, as 73% of first generation Bangladeshi Tower Hamlets residences experienced language issues while visiting health professionals. The language barrier was more prominent among females (94%) than males (58%) ($p < 0.001$). This may be a reason why only 20% of subjects claim to be registered with a dentist, and only 33% of participants visited a dentist in the past year, while 25% of the sample have never visited a dentist (Pearson et al. 1999).

5.14 Targeting of health information

Research by Vora et al. (2000) suggests second generation South Asian males from Leicester noted sources of health knowledge included school/college education, the press and media, and health education leaflets. The press and media is where the majority (over 50%) of Hindu, Jain, and Muslims heard about oral cancer. According to the HDA report (2000), South Asians primarily receive health promotion messages from the Asian broadcast media, and this should be used to promote health messages regarding tobacco risks by highlighting the health risks of smokeless

tobacco. This method will overcome language and cultural barriers typically found in print media for this audience and will reach a greater audience. Asian print media, commonly accessed by older and younger generations and could also be seen as a good source for promoting health messages within the South Asian community. Health promotion leaflets are often inaccessible to South Asians since there are cultural and language barriers; however, using a simplistic writing style and design in many languages could overcome these barriers and make the information more culturally appropriate. The HDA report (2000) stated the greatest response to health information derives from face to face contact with community members, so using the community to promote health messages may be a good method to reaching South Asians. Another way to access this group, as cited in the report, would be to draw upon the experiences of members of the community (vignettes), as well as use religion as a method to reach this group and highlight specific health issues. Also found within the HDA report (2000) was information stressing the importance of a nationally coordinated public information system that has the scope to work with multi-language populations in regards to tobacco. Since South Asians use smokelesstobacco to cope with indigestion, more attention should be paid to risk awareness and providing healthier alternatives. Rees (2007) indicated that tobacco cessation advisors have helped South Asians overcome their smokeless tobacco habit by using Nicotine Replacement Chewing Gum and behavioural support. In Leicester, a range of tailored public health messages have been targeted at South Asian populations through a series of presentations, workshops, information stands, leaflets and posters. These efforts are especially utilised during culturally important events to target at-risk communities. Additionally, workshops can be seen as a forum for staff, such as health development workers, to share knowledge and raise awareness of theissue facing South Asian communities. For example, smokeless tobacco training has been part of a number STOP! Advisor training programmes (Rees 2007).

6. Discussion

6.1 Summary of evidence

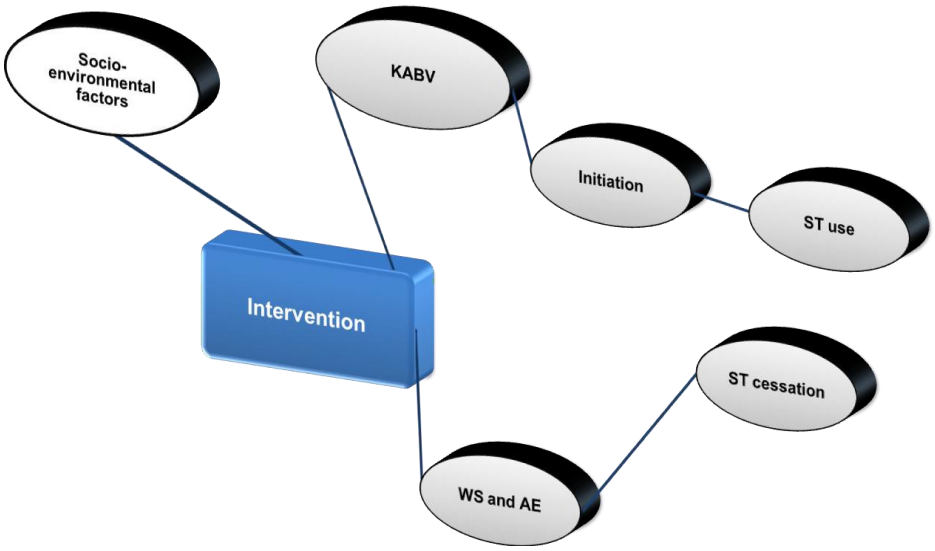
6.1.2 Question 1: Interventions

Question one explored the types of interventions (behavioural, educational and/or pharmacological) that are most effective for smokeless tobacco cessation for South Asian populations, as well as the factors (internal and external) that influence overall effectiveness of the intervention. A total of 15 studies have been included in this review. Seven papers were linked to one school-based intervention trial implementedin India (Project MYTRI), six papers were linked to UK work by Croucher et au, and the remaining paper provided evidence from a community-based RCT (ATCEP study) also conducted in India. The number of participants included in this effectiveness review is 55 477; however, this does not account for overlap between studies by the same author.

In terms of tobacco use and intentions to use tobacco, evidence from Project MYTRI showed that the intervention components had a positive effect on decreasing the risk of tobacco use and intentions to use tobacco through the modification of psychosocial factors including individuals' knowledge, attitudes, beliefs and values related to tobacco use. This effect was consistently reported in each of the papers providing evidence from Project MYTRI. The anti-tobacco education component included in the ATCEP study had a similar effect on tobacco use with significant changes in prevalence of tobacco use and quit rates pre- and post-intervention. However, it is unclear if these reductions in risk are due to the intervention's direct impact on changing individuals' knowledge, attitudes, beliefs and values or some other factor. Results from papers by Croucher, Pau, and Mishra showed that a small proportion of completers of a 4-week tobacco cessation programme were able to successfully stop using smokeless tobacco and that the use of behavioural support incombination with NRT is particularly effective to having a successful quit attempt. Participants included in the NRSs typically chose nicotine replacement therapy (NRT) and behavioural support as the method of cessation. Client age, ethnicity and level of dependency were not related to a successful quit attempt. Furthermore, women were more likely to make a successful quit attempt compared to men. Additional factors related to successful quit attempts included: above mean number of contacts per client, fewer withdrawal symptoms at first follow-up and fewer adverse events (e.g., oral pain or discomfort) at first follow-up. Figure 2 is a conceptual model, developed by the authors of this review, to display a summary of findings for question

1. This model is based on the components of interventions, and depicts the interaction of the various pathways for smokeless tobacco cessation in South Asians who participated in interventions.

Figure 2: Interventions model



KABV: knowledge, attitudes, behaviour, values
ST: smokeless tobacco
WS: Withdraw symptoms
AE: Adverse events

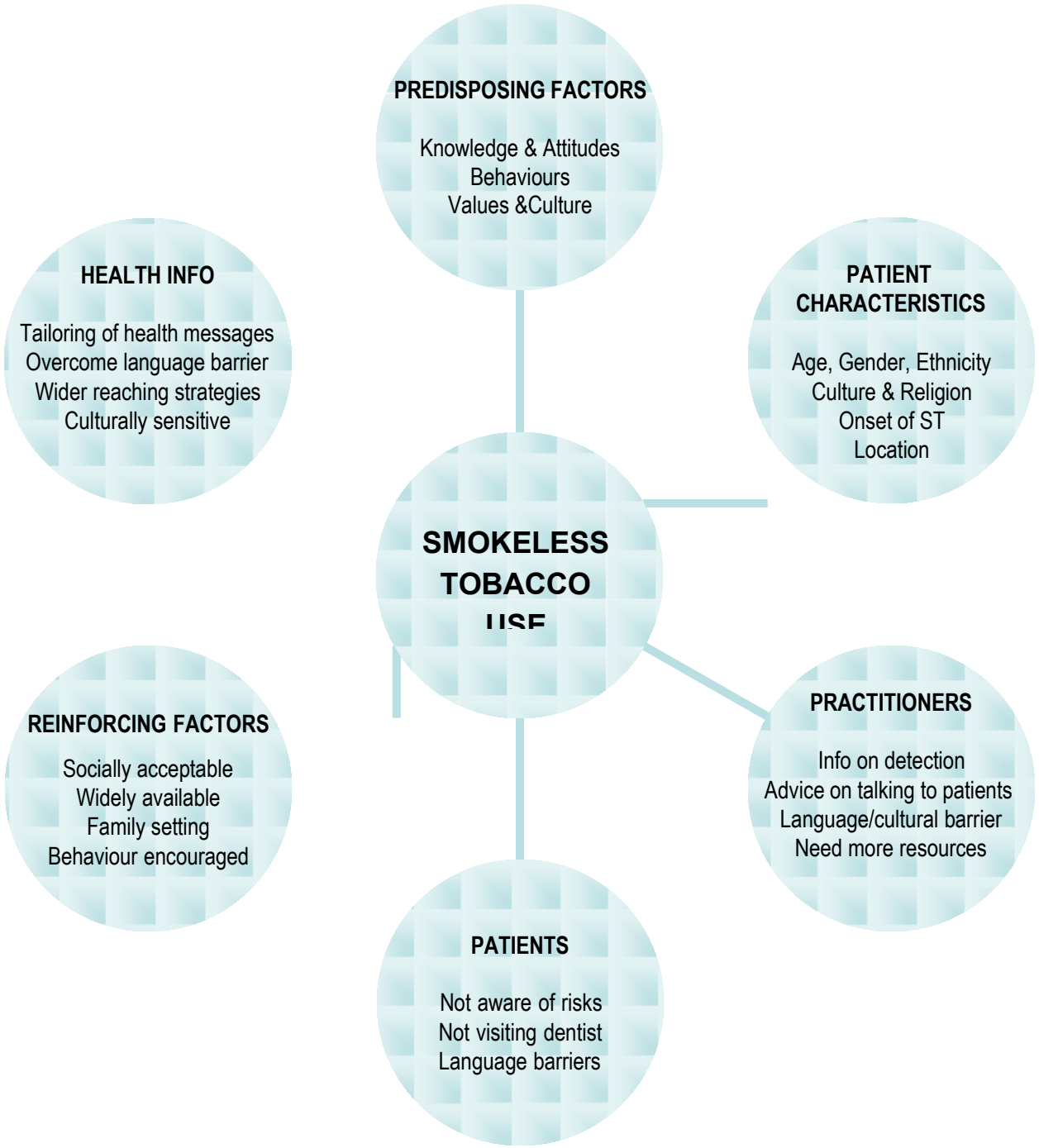
6.1.2 Question 2: Review of contextual factors

Question two addressed contextual factors associated with smokeless tobacco use among South Asians, as well as examining the views of health practitioners. Fourteen studies from OECD countries were systematically identified out of a possible 2968 records. The number of participants included in all studies reported in this contextual review is 3056, with 426 participants representing views from dental and health professionals. According to the research, paan and smokeless tobacco is a popular habit, often engaged in a family setting, and practised by South Asians within the UK. This habit is deeply rooted in the social, religious, and cultural heritageof South Asians. Smokeless tobacco is used among men, women and youth, although tobacco smoked in cigarettes is not a socially acceptable practice for women so many women resort to using smokeless tobacco products. While smokeless tobacco is not seen as a socially acceptable habit for children and youth, results indicate an early age of onset. Habits are supported by the fact that smokeless tobacco products are widely available and accessible within the UK.

Reasons for chewing smokeless tobacco vary, but there appears to be some consistency among the evidence to suggest many people use the products for social, traditional, normative, or health reasons. The evidence revealed that some respondents were aware of the health risks of tobacco, many were unaware of the potential harms of smokeless tobacco, and this was coupled with the fact that many South Asians do not visit a dentist. In terms of health risks, some respondents believed that tobacco has positive effects on health including easing oral pain, aiding digestion, and support oral hygiene. Some respondents indicated a high desire to quit, but going without tobacco was noted as difficult.

Within this contextual review, view of health professional indicated dentists are the first line of contact for smokeless tobacco users; however, dentists would like more information on how to speak to patients about smokeless tobacco risks, required more resources and training, as well methods to overcome the language barriers between patients and practitioners. In terms of health information, it should be culturally appropriate and targeted at South Asians through the media, print, and within their own communities. Figure 3, developed by the authors of this review, provides an overview of contextual factors relating to smokeless tobacco use among South Asians. The figure draws upon themes and findings from included papers to illustrate the various factors that impact on smokeless tobacco use within South Asian communities in the UK.

Figure 3: Contextual factors relating to smokeless tobacco use among South Asians



6.2 Merging of evidence

Combined evidence from questions one and two are summarised in the matrix which shows areas of overlap between both questions. Please refer to table 5 for details. The areas of overlap between questions one and two were limited; however, complementary evidence was found in areas of reasons for using smokeless tobacco, populations of users, onset of habit, challenges of quitting, knowledge of health effects, and conveying health information to South Asian communities.

In the intervention review, psycho-social factors (knowledge of health effects, beliefs about social effects, reasons to use tobacco, reasons not to use tobacco, self-efficacy (refusal skills), social susceptibility of chewing and social susceptibility of smoking) within the intervention were linked to reasons for not using; however, in the context review, social factors and tradition were cited as reasons why South Asians used smokeless tobacco. Populations for both questions included men, women, and youth, the primary difference was the inclusion criteria for question two resulted in studies from OECD countries only (all UK). The onset of the habit was mentioned in the interventions studies by Croucher et al with a mean onset age of 23 years. According to the context review, onset of chewing was cited as early as pre-teens. Within the intervention questions, NRT was used in some studies as an aid in cessation, but this was not noted in any of the papers included in the context review. This might suggest NRT is not widely used, accessible, or acceptable within the South Asian community. In the MYTRI studies, school based interventions impacted on smokeless tobacco use outcomes in youth. (Project MYTRI was found to have a consistent, positive effect on knowledge of health effects, reasons to use, reasons not to use, advocacy skills efficacy, normative beliefs and beliefs about social consequences, and were consistent mediators for intentions to use tobacco). Within the context review, the desire to quit was high, but many South Asians found it difficult to go without tobacco, especially if they were heavy product users. Some of the reasons why it was difficult to go without tobacco were not specifically stated, but reflecting on findings from question one, it reasonable to assume that withdraw symptoms might impact on quitting. Furthermore, findings from the context review could be interpreted to suggest that quitting may be difficult since smokeless tobacco habits are deeply rooted in South Asian tradition, many people use in social settings and among family, and South Asians believe chewing could be beneficial for health. Interventions, specifically the MYTRI project, had a positive effect on knowledge of smokeless tobacco risks, which is promising given that the contextual review

revealed that South Asians have limited knowledge of these risks. While some South Asians were aware of the health risks of using smokeless tobacco, there appeared to be some South Asians who believed it was good for their health. Interventions are one way to increase the spread of health information into the South Asian community; although the use of Asian media, South Asian community members, leaflets, and health promotion campaigns were suggested by the context review. Alsosuggested was targeted and culturally appropriate health messages in a suitable language, and this may serve to increase the uptake of health messages within South Asian communities in the UK.

Table 5: Matrix for comparing findings from effectiveness and contextual reviews

Main Findings	Question 1: Effectiveness	Question 2: Contextual
Reasons for use	▪ Psycho-social factors related to not using tobacco	▪ Use of smokeless tobacco is related to social, traditional, habitual, and health factors
Populations	▪ Mixed gendered ▪ Adults and youth (varying ages ▪ Schools, community or workplace ▪ South Asians from India and the UK ▪ Current users or non-users	▪ Mixed gendered ▪ Adults and youth (varying ages) ▪ South Asians in the UK ▪ First and second generation of users ▪ Current users of smokeless tobacco ▪ Some adding tobacco to their paans
Onset of habit	Average age mean= 23	▪ Early onset (pre-teens) ▪ Started habit outside the UK and in the UK ▪ Family setting ▪ Male purchasers (females often do not purchase)
Quitting	▪ NRT and advice as an aid in cessation ▪ Prevention in youth to change outcomes ▪ Withdraw symptoms ▪ Adverse events ▪ Gender differences in quitting	▪ Difficult to go without tobacco ▪ High desire to quit ▪ Those who chew less are more likely to quit
Knowledge	▪ Interventions positively affect knowledge of smokeless tobacco risks ▪ Increased knowledge of health effects decreases intention to use	▪ Limited knowledge of risks ▪ Influenced by cultural beliefs about benefits of smokeless tobacco for health ▪ Some were aware of health risks ▪ Risk of smokeless tobacco are far less widespread than smoking
Health information	▪ Mass media: posters, leaflets, billboards ▪ Audio visual and print ▪ One to one and group settings of interventions ▪ Community, workplace, and schools good settings for health messages about smokeless tobacco	▪ Language of health messages were a barrier ▪ The following would be helpful for promoting health messages to South Asians: ▪ Use of mass media, cultural appropriate messages, multi-languages used in print. ▪ Tailor messages to the community with the support of community members and religion

6.3 Limitations, implication, and areas of no evidence

A major limitation of question one is the limited availability of evidence in regards to smokeless tobacco interventions targeted at South Asians. Trials conducted in India have limited applicability to the UK and should be interpreted with caution; however, these studies may be somewhat applicable to UK South Asians since some may

have lived in South Asia prior to moving to the UK. Also, some studies included in question one were not conventional interventions (in regards to methods), or did not have appropriate control groups, making it difficult to evaluate effectiveness of cessation interventions. Further studies are required that utilise a RCT design with clear intervention and control groups within South Asian communities to determine if interventions are effective in smokeless tobacco cessation, as well as measure the possible adverse effects and harm reduction of cessation such as oral pain or substitutes for tobacco such as more harmful cigarettes.

Within question two, there was limited evidence to address the reasons 'why' South Asians use smokeless tobacco. There appeared to be a focus on cross-sectional surveys which did not provided in-depth information into the social, cultural reasons why South Asians use smokeless tobacco. This being the case, detailed subgroup analysis was not possible given the already thin evidence base on this topic. More qualitative evidence could shed some light on these issues, which were only briefly touched upon in the papers included in this review. Also, trials should follow up with process evaluations to determine the acceptability of interventions among this population are needed since it is known that is group has distinct social, cultural and language needs.

Another limitation of this review was the lack of cost effectiveness evidence. The detailed search strategy revealed no cost-effectiveness studies relevant to South Asians and smokeless tobacco.

6.4 Applicability to the UK and existing literature

6.4.1 Applicability to the UK

The UK studies by Croucher et al and Pau et al were relevant to the populations within the UK since they were conducted within areas that are largely populated by South Asians, but standardised interventions are needed in these communities. The interventions conducted in India were well conducted, but have limited applicability to the UK since they were conducted in India where education, economies, populations, geography, and health systems are significantly different from the UK context. It is important to note that there is some value in including evidence with South Asian

countries in this review since South Asian immigrants may have originated from these countries.

For question two, OECD inclusion criteria aimed to limit countries to those most closely matched to the UK, and all included studies were relevant since they were conducted in the UK, with specific focus on London, the Midlands, and Yorkshire areas with highest proportion of South Asians, thus all studies are highly relevant to the UK context and populations of interest for this review.

6.4.2 Relevant literature outside current South Asian scope

The results from Ebbert et al. 2009 and its two recent updates (Ebbert et al. 2011; Ebbert & Fagerstrom, 2012) provide some insight towards understanding the types of interventions that could potentially be most effective and cost effective for cessation of smokeless tobacco use and whether those interventions would have any adverse effects; however, these reviews did not focus on South Asians. Ebbert et al. (2009), Ebbert et al. (2011) and Ebbert & Fagerstrom (2012) assessed the effects of behavioural and pharmacological interventions to treat smokeless tobacco use. The trials included in these reviews assessed the effects of bupropion, NRT and varenicline with and without additional behavioural intervention, as well as, trials which assessed the effectiveness of behavioural intervention alone. Data from 25 trials and more than 11,000 users of smokeless tobacco were included in the first update of Ebbert et al. (2009).

Overall, the results from Ebbert et al. (2009) and its updates showed a benefit of behavioural interventions in changing smokeless tobacco use and furthermore, Ebbert et al. (2011) and Ebbert & Fagerstrom (2012) also found that the use of varenicline was an effective pharmacotherapy for increasing abstinence rates of smokeless tobacco use among US and Swedish populations. However, Ebbert et al. (2009), Ebbert et al. (2011) and Ebbert & Fagerstrom (2012) contain no data regarding the effectiveness of the types of interventions (e.g., brief advice and encouragement with and without NRT) and initiatives that are of interest to NICE and are essential to informing the development of public health guidance regarding cessation services for South Asian users of smokeless tobacco in the UK. Furthermore, the literature included in the Ebbert reviews is substantially biased towards interventions conducted in the US and in Sweden. Thus, it cannot be assumed that interventions which have been generally successful in the US and

elsewhere will be effective to our population of interest; Hence, the need for undertaking the current systematic review.

The results of the current effectiveness review indicate that the literature related to smokeless tobacco cessation among South Asians is not well developed, especially in terms of good quality effectiveness and cost effectiveness studies. Like the Ebbert reviews, the current effectiveness review considered a range of interventions encompassing counselling and behavioural support, in addition to pharmacological interventions and data from several large source populations. However, unlike Ebbert and colleagues (2009,2011, 2012) which found evidence to support the efficacy of pharmacological and behavioural interventions among US and Swedish populations, the findings from the current effectiveness review did not find similar supporting evidence regarding the success of these types of interventions in reducing smokeless tobacco use among South Asians in the UK and elsewhere.

6.5 Evidence statements

6.5.1 Question 1 Effectiveness interventions review

Overview of evidence identified

The effectiveness of intervention programmes in the cessation of smokeless tobacco use among South Asians was examined. The following is a synthesis of findings from the included studies. Evidence from fifteen studies will be presented. However, since only four interventions where identified, it needs to be acknowledged that there is a fair amount of overlap in reported findings. Thus, the studies are grouped by intervention programme: The Anti-Tobacco Community Education Program (ATCEP), The Bangladeshi Stop Tobacco Project (BSTP), Project MYTRI and The World No Tobacco Day cessation programme (WNTD). The ATCEP and Project MYTRI are randomised controlled trials. The ATCEP is a community-based trial and Project MYTRI is a school-based trial. The BSTP and The WNTD programme are non- randomised studies. The BSTP is a community-based programme and the WNTD isa workplace programme.

What types of interventions (behavioural, educational and/or pharmacological) are most effective and cost effective for cessation of smokeless tobacco use in South Asian populations worldwide and in the UK? Do they have any adverse effects?

Interventions providing behavioural support or counselling for individuals or groups—The BSTP and The WNTD:

Evidence statement 1: Behavioural support or counselling for individuals or groups: Tobacco use—Daily paan chewing and Prevalence of self-reported tobacco use

There was an insufficient amount of evidence that shows interventions which provide behavioural support or counseling for individuals or groups can reduce daily paan chewing among South Asians. There was no evidence that shows interventions which provide behavioural support or counseling for individuals or groups can reducethe prevalence of self-reported tobacco use among South Asians.

Evidence statement 2: Behavioural support or counselling for individuals or groups: Quit success—Behavioural support alone

A.) Brief advice and encouragement

There was moderate evidence from one UK quasi-experimental study (Croucher et al. 2003a [+] that brief advice and encouragement can have a positive effect on quitting tobacco among South Asians. Findings from the Croucher et al. (2003a [+]) showed that of those who completed the four-week BSTP cessation program and reported successfully quitting tobacco, 17% used brief advice and encouragement without NRT as their method of cessation. This evidence is applicable to a UK settingas this study was conducted in the UK.

B.) Focus group discussions

There was weak evidence from one Indian interventional cohort study (Mishra et al. 2009 [-]) that focus group discussion sessions had a positive effect on self reported quit rates in South Asians. Quit rates following the first, second, third, fourth, fifth and sixth focus group sessions of the WNTD programme were 30%, 44%, 48%, 46%,

46% and 48% respectively—with an overall quit rate of 40% at the end of the study. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 3: Behavioural support or counselling for individuals or groups: Quit success—Behavioural support and pharmacotherapy

There was moderate evidence from one UK quasi-experimental study (Croucher et al. 2003a [+]); one UK retrospective review of client records (Croucher et al. 2011c [+]) and one Indian interventional cohort study (Mishra et al. 2009 [-]) that behavioural support and pharmacotherapy in combination can have a positive effect on stopping tobacco use among South Asians. Croucher et al. (2011c [+]) found that use of NRT with behavioural support was an independent predictor of a successful cessation attempt (OR=5.38, 95% CI 2.71, 10.70), while Croucher et al. (2003a [+]) found that at the end of the four-week BSTP cessation programme, 19.5% of completers had stopped tobacco use—of which 22% had received NRT in addition to behavioural support. Furthermore, BSTP clients who chose the addition of NRT made a significantly greater reduction in their salivary cotinine scores at final review compared to baseline. Five tobacco users from the WNTD programme were offered pharmacotherapy. One employee quit tobacco while two employees did not comply with the pharmacotherapy because of side effects following the use of Bupropion. The overall quit rate amongst the pharmacotherapy and behavioural support group was 20% (Mishra et al. 2009 [+]).This evidence is partially applicable to UK settings and to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 4: Behavioural support or counselling for individuals or groups: Quit success—Gender

There is contradictory evidence from one UK pilot study (Croucher et al. (2011b [+]) and one UK progress review study (Croucher et al. (2011a [-]) that gender can have a positive effect on stopping tobacco use among South Asians. Interim results from Croucher et al. (2011a [-]) reported that among BSTP clients, women were more likely than men to make a successful quit attempt. In contrast, Croucher et al. 2011b [+] no association between gender and quit success. Although, it was reported that male clients were more likely to have received combination NRT (i.e., more than one

form of NRT). This evidence is applicable to a UK setting as these studies were conducted in the UK.

Evidence statement 5: Behavioural support or counselling for individuals or groups: Quit success—Adverse events and withdrawal symptoms

There is moderate evidence from one UK quasi-experimental study (Croucher et al. (2003a [+]);one UK pilot study (Croucher et al. 2011b [+]); one UK progress review study (Croucher et al. 2011a [-]) and one Indian interventional cohort study (Mishra et al. 2009 [-]) that adverse events and withdrawal symptoms can effect quit success among South Asians. Interim results from Croucher et al. (2011a [-]) reported that BSTP clients who experienced a lower mean number of withdrawal symptoms or lower mean number of adverse events at first follow-up at 2 weeks were more likelyto make a successful quit attempt. Croucher et al. 2011b [+] found that BSTP clients with fewer withdrawal symptoms at first follow-up was significantly associated with a successful quit attempt (p=0.005). Fewer NRT-related adverse events at first follow- up were also significantly associated with a successful quit attempt (p=0.028) whilst those reporting oral pain and discomfort at first follow-up were less likely to make a successful quit attempt (p=0.034). Croucher et al. (2003a [+]) found that oral painwas reported as a barrier to successful oral tobacco cessation by 62% of the volunteers at final review. Employees in the WNTD programme who relapsed after initial quitting stated physical discomfort like constipation as a reason for relapse and not achieving successful cessation (Mishra et al. 2009 [-]).This evidence is partially applicable to UK settings and to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 6: Behavioural support or counselling for individuals or groups: Psychosocial factors

There is weak evidence from one Indian interventional cohort study (Mishra et al. 2009 [-]) that shows interventions which provide behavioural support or counselling for individuals or groups can have a positive effect on knowledge related to the harmful effects of tobacco. Mishra et al. (2009 [-]) found there was considerable improvement in the knowledge, attitudes and practices related to tobacco use among WNTD participants post-intervention. A comparison of pre- and post-intervention found increases in knowledge regarding harmful forms of tobacco (43.3% vs. 85.0%), cigarette safety (54.8% vs. 85.0%), risk for heart attack (47.2% vs. 67.0%) and

availability of professional cessation services (75.0% vs. 98.0%). This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 7: Behavioural support or counselling for individuals or groups: Quit success—Programme satisfaction

There is limited evidence from one UK pilot study (Croucher et al. 2011b [+]) and one Indian interventional cohort study (Mishra et al. [-]) that shows client satisfaction with intervention components can have a positive effect on stopping tobacco use among South Asians. Croucher et al. (2011b [+]) found that clients reported being either 'satisfied' (36.5%) or 'very satisfied' (63.5%) with the support they had received for their quit attempt and that 97% would recommend the service to other smokeless tobacco users. Nearly all BSTP clients (97%) reported that they would return to the service for any future quit attempt. Clients were more likely 'very' satisfied if male (p=0.035) and if they reported below the mean number of adverse events compared to other clients in the second week of follow-up (p=0.016). The majority of the employees in the WNTD programme appreciated the program and believed that ithad helped them to bridge the gap between their thoughts and behaviour and motivated them to stop tobacco use (Mishra et al. 2009 [-]). This evidence is partially applicable to UK settings and to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 8: Behavioural support or counselling for individuals or groups: Quit success—Uptake of programme components

There is moderate evidence from one Indian interventional cohort study (Mishra et al. 2009 [-]) that shows the uptake of behavioural support can have a positive effect on stopping tobacco use in South Asians. For the WNTD programme, tobacco users were offered behavioural therapy in the form of focus group discussion (FGD) and one-to-one counselling from round two onwards. Among the 50 tobacco users invitedfor the FGD, 90% participated in the first session, 88% in the second session, 88% inthe third session, 66% in the fourth session, 90% in the fifth session, 84% in the sixthsession and 86% in the seventh session. Quit rates following the first, second, third, fourth, fifth and sixth focus group sessions were 30%, 44%, 48%, 46%, 46% and 48% respectively—with an overall quit rate of 40% at the end of the study. This evidence is partially applicable to people of South Asian ancestry living in the UK

who may have maintained cultural and social practices related to smokeless tobacco use.

Brief interventions (including brief advice) by health and social care professionals, including dental practitioners and GPs

Evidence statement 9: Brief interventions (including brief advice): Interventions delivered by health and social care professionals

There are no available data regarding the effect of brief interventions (including brief advice) by health and social care professionals on smokeless tobacco use among South Asians.

Brief interventions (including brief advice) by community members or peers—Project MYTRI

Evidence statement 10: Brief interventions (including brief advice) by community members or peers: Tobacco use—Prevalence of self-reported tobacco use

There is moderate evidence from two Indian RCTs (Perry et al. 2009 [+]; Stigler et al. 2007 [+]) that show interventions delivered by peers can have a positive effect on reducing tobacco use among South Asians. Perry et al. (2009 [+]) found that the rates of cigarette smoking and bidi smoking, as well as any tobacco use among students aged 10-16, increased over time in the control group, while the rate of tobacco use in the intervention group actually decreased over time. There were no significant between-group differences in the change in rate of chewing tobacco use ($p>0.10$) among students who participated in Project MYTRI. Tobacco use increased by 68% in the control group and decreased by 17% in the intervention group over the2 years. Stigler et al. (2007 [+]) reported no differences between intervention and control groups in baseline rates of tobacco use. After 1 year of implementation, no significant differences in actual tobacco use were observed. However, the prevalenceof tobacco use decreased in both conditions over time. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 11: Brief interventions (including brief advice) by community members or peers: Quit success

There are no available data regarding the effect of brief interventions delivered by community members or peers on quit success among South Asians.

Evidence statement 12: Brief interventions (including brief advice) by community members or peers: Adverse events and withdrawal symptoms

There are no available data regarding the effect of brief interventions delivered by community members or peers on adverse effects and withdrawal symptoms among South Asians

Evidence statement 13: Brief interventions (including brief advice) by community members or peers: Psychosocial factors—Knowledge, attitudesand beliefs

There is moderate evidence from two Indian RCTs (Perry et al. 2009 [+]; Stigler et al. 2011 [+]) that show brief interventions delivered by community members or peers can have a positive effect on knowledge, attitudes and beliefs among South Asians. Perry et al. (2009 [+]) found that there were significant differences between the intervention and control groups for Project MYTRI with respect to knowledge of the health effects of tobacco use, reasons to use and not use tobacco, perceived prevalence of chewing tobacco use, perceived prevalence of smoking, normative beliefs regarding tobacco use, advocacy skills self-efficacy, knowledge of tobacco-control policies, and social susceptibility to chewing tobacco use (all: $p<0.05$). Stigler et al. (2011 [+]) found that Project MYTRI had a consistent, positive effect on knowledge of health effects, reasons to use, reasons not to use, advocacy skills efficacy, normative beliefs and beliefs about social consequences. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 14: Brief interventions (including brief advice) by community members or peers: Psychosocial factors—Intentions to use tobacco

There is mixed evidence from four Indian RCTs (Bate et al. 2009 [+]; Perry et al. 2009 [+]; Stigler et al. 2007 [+]); Stigler et al. 2011 [+]) that show brief interventions delivered by community members or peers can have a positive effect on intentions touse tobacco among South Asians. Results from Bate et al. (2009 [+]) indicated that the psychosocial risk factors Knowledge of Health Effects, Normative Beliefs, Reasons to Use Tobacco, and Perceived Prevalence were significant mediators between the intervention activities and students' tobacco use intentions. However, Beliefs about Social Consequences, Normative Expectations, Self-Efficacy in RefusalSkills, Support for Tobacco Control Policy, Social Susceptibility to Chewing and Social Susceptibility to Smoking where not affected by the intervention. For multiple mediator models, significant mediating psychosocial risk factors for intentions to chew included: Knowledge of Health Effects, Normative Beliefs, Reasons to Use Tobacco and Perceived Prevalence of Chewing.

Evidence of inconsistent mediation was observed for the Perceived Prevalence.Perry et al. (2009 [+]) found that there were significant differences in the rates of growth of students' intentions to chew tobacco ($p<0.03$) over time, with the intervention students decreasing their intentions more than the control group. Intentions to chew tobacco decreased by 12% in the control group and by 28% in theintervention group. Stigler et al. (2007 [+]) found that fewer students in the intervention condition reported having intentions to chew tobacco when they reached college ($p<0.01$). After only 1 year of implementation, students in the intervention condition had fewer intentions to chew tobacco as they reached college age ($p<0.01$). Marginally significant differences were noted in their intentions to smoke in college ($p=0.08$) or as an adult ($p=0.08$), as well as the intentions to chew tobacco asan adult ($p=0.07$).

Stigler et al. (2011 [+]) found that changes in normative beliefs had a consistent effect on intentions to use tobacco, accounting for 95% of the total intervention effect in multivariable models. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 15: Brief interventions (including brief advice) by community members or peers: Implementation—Training of teachers

There was limited evidence from one Indian cluster RCT (Goenka et al. 2010 [+]) that showed the training of teachers had a positive effect on implementation of intervention components and objectives and better intervention outcomes. Goenka etal. (2010 [+]) found that the proportion of teachers trained in a school correlated with better implementation of objectives ($r=0.58$, $p<0.02$) and superior peer leaders–student communications ($r=0.75$, $p<0.001$). It was also of greater benefit in lowering the susceptibility to chewing tobacco ($r=0.53$, $p<0.05$). Furthermore, the communication between students and peer leaders ($r=0.66$, $p<0.005$) and higher proportion of students participating in the classroom discussions ($r=0.70$, $p<0.005$) correlated with better outcomes. Schools with a higher proportion of teachers trained also had better communication between the students and peer leaders. This evidence is partially applicable to people of South Asian ancestry living in the UKwho may have maintained cultural and social practices related to smokeless tobacco use.

Local community-based initiatives to raise awareness of the harm caused by smokeless tobacco and to encourage the uptake of cessation services by people who use smokeless tobacco—The ATCEP study

Evidence statement 16: Local community-based initiatives to raise awareness: Tobacco use—Prevalence rates

There is moderate evidence from one Indian RCT (Anantha et al. 1995 [+]) that showed tobacco education interventions which raise awareness about the harmful effects of tobacco can have a positive effect on prevalence rates of tobacco use among South Asians. Post-intervention, results from the ATCEP showed a decline in rates from baseline to final assessment at 3 years—with a 10.2% decrease for males in the experimental area compared to 2.1% and 0.5% decrease in the control areas ($p<0.0001$). For females, there was a 16.3% reduction in the experimental area compared to 2.9% and 0.6% in the control areas ($p<0.0001$). Post-intervention, there was a 5.6% reduction in the percentage of males who reported tobacco chewing compared to 1.2% and 0% reduction in the control areas ($p<0.0001$) (Anantha et al. 1995 [+]).This evidence is partially applicable to people of South Asian ancestry living

in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 17: Local community-based initiatives to raise awareness: Tobacco use—Initiation rates of tobacco use

There is mixed evidence from one study Indian RCT (Anantha et al. 1995 [+]) that showed tobacco education interventions which raise awareness about the harmful effects of tobacco can have a positive effect on decreasing initiation rates of tobacco use among South Asians. Baseline initiation rates of tobacco use from the ATCEP showed that male rates were comparable between the experimental and control areas. However, the rate among females was different. Initiation rates of tobacco usein the experimental area showed a statistically significant decline in males ($p<0.01$) and females ($p=0.005$) between the baseline and the first follow-up surveys at 2 years. At the final 3 year assessment, males in the first control area did not show a statistically significant decline in the initiation rate ($p=0.16$). At the final 3 year assessment, the initiation rate of chewing among males was 0.2% and that ofsmoking 0.1% in the experimental area. In control area I, the initiation rate of chewingwas 0.1% compared with 0.3% for smoking. In control area II, the initiation rates were0.4% and 0.9% for chewing and smoking respectively. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 18: Local community-based initiatives to raise awareness: Tobacco use—Quit rates

There is mixed evidence from one Indian RCT (Anantha et al. 1995 [+]) that showed tobacco education interventions which raise awareness about the harmful effects of tobacco can have a positive effect on increasing quit rates of tobacco use among South Asians. Results from the ATCEP indicated that the numbers and rates of persons who had quit using tobacco at the time of first repeat survey at 2 years was much higher in the experimental area compared with the control areas (in males, 26.5% in the experimental area vs. 3.2% and 1.1% in control areas I and II, respectively; and in females, 40.7% in the experimental area vs. 2.4% and 0.2% in control areas I and II, respectively). By the end of follow-up at 3 years, results from the experimental area showed a decrease in quitters' by 4.0% in females and no change in the rate for males. The quit rate among male chewers also showed a

decrease over time as well—with the percentage of quitter declining from 32.0% to 30.2% between the first follow-up survey at 2 years and the final survey at 3 years. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Evidence statement 19: Local community-based initiatives to raise awareness: Tobacco use—Adverse events and withdrawal symptoms

There are no available data regarding the effect of adverse events and withdrawal symptoms on stopping tobacco use among South Asians.

Evidence statement 20: Local community-based initiatives to raise awareness: Tobacco use—Psychosocial factors

There are no available data regarding changes in psychosocial factors, such as knowledge, attitudes or beliefs and their effect on stopping tobacco use among South Asians.

Evidence statement 21: Local community-based initiatives to raise awareness: Implementation—Health education materials

There is limited evidence from one Indian RCT (Anantha et al. 1995 [+]) that showed implementation of health education materials can have an effect on stopping tobacco use among South Asians. Participants in the ATCEP study were exposed to one of three types of health communication methods (printed, audio-visual and inter- personal communication). There was no marked difference in the proportion of quitters exposed to reading material and inter-personal communication compared to the proportion non-quitters who were exposed to these materials. However, with regard to the audio-visual forms of education, during the first follow-up, 68.6% of quitters were exposed to the films on chewing and smoking compared with 57% of non-quitters. During the final assessment, 95.7% of quitters had viewed the films compared with 90% of non-quitters. This evidence is partially applicable to people of

South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

Interventions to raise awareness and knowledge among health and social care professionals about smokeless tobacco use

Evidence statement 22: Interventions to raise awareness and knowledge: Interventions for health professionals

There are no available data regarding brief interventions (including brief advice) to health and social care professionals and their effect on smokeless tobacco use among South Asians.

What external factors influence the effectiveness of the intervention (such as content, delivery, setting, who is delivering the intervention, intensity, duration and target setting)?

Evidence statement 23: External factors influencing the effectiveness of the intervention—Setting

There was no evidence that compares intervention effectiveness directly between settings, therefore it is not possible to determine whether a particular setting is better than any other in terms of outcomes.

Evidence statement 24: External factors influencing the effectiveness of the intervention—Content

There was no evidence that provides a direct comparison of intervention components and their effect on intervention outcomes. Therefore it is not possible to determine whether a particular intervention component or group of components is better than any other in terms of outcomes.

Evidence statement 25: External factors influencing the effectiveness of the intervention—Intensity

There was no evidence available regarding the level of intervention intensity and its effect on intervention outcomes.

Evidence statement 26: External factors influencing the effectiveness of the intervention—Duration

There was moderate evidence from one UK quasi-experimental study (Croucher et al. 2003a [+]), one UK progress review study (Croucher et al. 2011a [-]), one UK pilot study (Croucher et al. 2011b [+]), and one UK retrospective review of client records (Croucher et al. 2011c [+]) that brief interventions can have a positive effect on stopping tobacco use among South Asians. Croucher et al. (2003a [+]) found that 91% of volunteers completed the 4-week trial. Results showed that 19.5% of BSTP completers had stopped tobacco use, of which 22% had received NRT, and 17% received brief advice and encouragement without NRT. The successful members of the NRT group made a significantly greater reduction in their salivary cotinine scores at final review compared to baseline. Croucher et al. (2011a [-]) reported a 54% quit rate among the 229 BSTP clients who completed the four-week intervention programme. Croucher et al. (2011b [+]) showed that 94% of BSTP clients used NRT in their quit attempt. Sixty-two percent reported a successful quit attempt at four weeks. Croucher et al. 2011c [+] found that at the end of the four-week intervention, self-reported continuous tobacco abstinence was 58.3% among BSTP clients. This evidence is applicable to a UK setting as this study was carried out in the UK.

Evidence statement 27: Deliverers of intervention components

There is moderate evidence from one Indian cluster RCT (Goenka et al. 2010 [+]) that showed tobacco education interventions delivered by teachers and peers can have a positive effect on intervention outcomes. A process evaluation of Project MYTRI found that the proportion of teachers trained in a school correlated with better implementation of objectives ($r=0.58$, $p<0.02$) and superior peer leaders–student communications ($r=0.75$, $p<0.001$). It was also of greater benefit in lowering the susceptibility to chewing tobacco ($r=0.53$, $p<0.05$). Furthermore, the communication between students and peer leaders ($r=0.66$, $p<0.005$) and higher proportion of students participating in the classroom discussions ($r=0.70$, $p<0.005$) correlated with

better outcomes. Schools with a higher proportion of teachers trained also had better communication between the students and peer leaders. This evidence is partially applicable to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

What internal factors influence the effectiveness, of the intervention (such as age, socio-economic status, ethnicity, and attempts at cessation)?

Evidence statement 28: Internal factors influencing the effectiveness of the intervention—Age

There was no evidence providing a direct comparison of age and its effect onstopping tobacco use among South Asians. Therefore it is not possible to determine whether a particular age group is likely to be more successful at quitting tobacco thananother age group.

Evidence statement 29: Internal factors influencing the effectiveness of the intervention—Socio-economic status

There is moderate evidence from one UK retrospective review of client records (Croucher et al. 2011c [+]) that showed socio-economic can have an effect on quit rates among South Asians. BSTP participants who were living in relatively less economically deprived areas) were found to be significantly more likely to have made a successful cessation attempt at four weeks compared to those who lived in very deprived areas (OR=1.98, 95% CI=1.17-3.32, p=.01). This evidence is applicable to a UK setting as this study was carried out in the UK.

Evidence statement 30: Internal factors influencing the effectiveness of the intervention—Ethnicity

There was a lack of evidence providing a direct comparison of ethnicity and its effect on stopping tobacco use among South Asians. Therefore it is not possible to determine whether a particular ethnic group is likely to be more successful at quitting tobacco than any other ethnic group.

Evidence statement 31: Internal factors influencing the effectiveness of the intervention—Attempts at cessation

There is limited evidence from one UK retrospective review of client records (Croucher et al. 2011c [+]) and one Indian interventional cohort study (Mishra et al. 2009 [-]) that the number of previous quit attempts can affect quit success. Croucher et al. (2011c [+]) reported that among BSTP clients who had ever attempted to quit tobacco in the past, 60.9% had successfully quit tobacco by the end of the four-week intervention and 39.1% were not successful. Forty-seven percent of the WNTD programme participants who quit tobacco, had attempted quitting in the past. Among the 20 employees who finally quit tobacco, 21% had attempted quitting tobacco once previously, 10% had attempted quitting twice previously, 10% had three previous attempts and one employee had attempted quitting seven times previously. Among the quitters, 53% had never attempted quitting in the past. However, after intense counselling by the tobacco control team they successfully quit tobacco (Mishra et al. 2009 [-]).This evidence is partially applicable to UK settings and to people of South Asian ancestry living in the UK who may have maintained cultural and social practices related to smokeless tobacco use.

6.5.2 Question 2: Contextual review

What opinions, attitudes, and cultural practices encourage or predispose South Asians to use smokeless tobacco?

Evidence statement 32: Characteristics of users

Moderate evidence from eight UK studies including two UK reports (HDA 2000 [+]; Rees 2007 [+]), and six cross sectional surveys (Ahmed et al. 1997 [+]; Bedi & Gilthorpe 1995 [+]; Pearson et al 1999 [+]; Vora et al. 2000 [+];Croucher et al 2002 [++] and Croucher et al. 2007 [++]) reported on how many respondents used smokeless tobacco. Eight percent of the South Asians in Leicester used smokeless tobacco products (Rees 2007 [+]).Thirty percent of Bangladeshi men within Tower Hamlets tobacco were users of smokeless tobacco (Croucher et al. 2007 [++]). Betel-quid was highest in Hindus from Leicester (21%) followed by 5% of Muslims andJains (Vora et al. 2000 [+]). In a Bangladeshi sample from Tower Hamlets, 78% chewed paan, with 52% adding tobacco (Pearson et al. 1999 [+]). Half (49%) of female Bangladeshis from Tower Hamlets used smokeless tobacco (Croucher et al 2002 [++]). Betel quid chewing was over 80% with no gender difference, and tobacco

was added to paan by more women (43% n=32) than men (29% n=19) (p.0.09) (Ahmed et al. 1997 [+]). In an East London study, 28% Bangladeshi adolescents sampled used betel quid, with 12% adding tobacco (Bedi & Gilthorpe 1995 [+]).

Evidence statement 33: Social acceptability

Moderate evidence from one UK qualitative study of reasonable quality set in Tower Hamlets (Croucher & Choudhury 2007 [+]), and two UK cross-sectional studies of reasonable quality set in Birmingham and Tower Hamlets (Ahmed et al. 1997 [+]; Bedi & Gilthorpe 1995 [+]) examined social acceptability of smokeless tobacco use among the genders and found smokeless tobacco is traditionally and culturally more appropriate for the female gender among South Asian communities. Females appeared to be more accepting of their own chewing habits, while men did not, and there was a general consensus that children should not be using betel quid (Ahmed et al. 1997 [+])

Evidence statement 34: Gendered use patterns

Contradictory evidence was found regarding gendered patterned use of smokeless tobacco in four UK cross-sectional studies (Bedi & Gilthorpe 1995 [+]; Pearson et al. 1999 [+]; Prabhu et al. (2001 [+]; Summers et al. 1994 [+]). In a Birmingham study there were similar levels of betel quid use for Bangladeshi men (92%) and females (96%) (Bedi & Gilthorpe 1995 [+]). In a study by Prabhu et al. (2001 [+]) set in East London, similar betel quid use between genders in a Bangladeshi sample was noted. In contrast, more Bangladeshi women (81%) from Birmingham added tobacco to their quids than men (37%) (Bedi & Gilthorpe 1995 [+]). Furthermore, a greater proportion of Bangladeshi women within Tower Hamlets participants were chewing more than men, and females were more likely to add tobacco to their pans than males ($p< 0.01$) (Pearson et al. 1999 [+]). According to a Yorkshire study of first generation Bangladeshi women, paan was used by 95% (282/295) of women, and 62% (174/295) of paan users added leaf tobacco (Summers et al. 1994 [+]).

Evidence statement 35: Onset of use

One UK qualitative report (HDA 2000 [+]), and four UK cross-sectional studies investigated the age and location of onset of smokeless tobacco use (Ahmed et al. 1997 [+]; Pearson et al. 1999; [+]; Prabhu et al. 2001 [+]; Summers et al. 1994 [+]).

Smokeless tobacco use was more prevalent among older South Asians; however, younger UK born South Asians are using smokeless tobacco products (HDA 2000 [+]. In a Tower Hamlets sample, 75% of smokeless tobacco users started in Bangladesh, but 25% of both sexes started chewing paan in London and were younger (average age 34 years) than those who started in Bangladesh (average age 44 years) (Ahmed et al. 1997 [+]). The mean age of onset of Bangladeshi users in Tower Hamlets was 20 years old (range 6-56). By 17 years 50% were chewing paan,with more males commencing chewing paan by 15 years of age than females ($p < 0.05$) (Pearson et al 1999 [+]). According to evidence by Prabhu et al. (2001 [+] set in East London, the median age of first chewing was as early as 9 years old with nearly most (86%) starting their chewing habits while living in London. In a Yorkshire study, 18% (51/295) were chewing by 10 years of age with a mean onset of 17 years (Summers et al. 1994 [+]).

Evidence statement 36: Predictors of use

Strong evidence from two UK cross-sectional studies (Croucher et al. 2002; [++]; Croucher et al. 2007 [++]), and moderate evidence from three UK cross-sectional studies examined predictors of smokeless tobacco use (Ahmed et al. 1997 [+];Prabhu et al. 2001 [+]; Summers et al. 1994 [+]). Bangladeshi women from Tower Hamlets who used smokeless tobacco were significantly older, had used ST for a longer period, and were more likely to cite habit as a reason for chewing, and were also more like to have their first paan after waking (Croucher et al 2002 [++]). In a male Bangladeshi sample from Tower Hamlets, smokeless tobacco users were foundto be older, more likely to have had no formal education, rate their health as average or poor, have increased chronic illness episodes, report current oral pain, have the lowest social capital score, and a high proportion of chewers (83%) had a wife that also used smokeless tobacco (Croucher et al 2007 [++]). A Yorkshire study ofBangladeshi women found that participants who consumed more paans daily were significantly older, less literate, had fewer years of formal education, and were more likely to believe that smokeless tobacco was a beneficial habit (Summers et al. 1994 [+]). Paan use appeared to be more likely among South Asian females in Tower Hamlets than males who were lighter users ($p < 0.001$) (Ahmed et al. 1997 [+]). Bangladeshi youth from East London who used paan were more likely to think it tasted good, had parents with lower educational attainment, and express less negative attitudes to harmful effects of uses on dental appearance and health/ oral cancer (Prabhu et al. (2001 [+]).

Evidence statement 37: Reasons for chewing- social, traditional, habitual

Moderate evidence from two UK reports (HDA 2000 [+]; Rees 2007 [+]), and three four UK cross-sectional studies (Bedi & Gilthorpe 1995 [+]; Pearson et al. 1999 [+]; Summers et al. 1994 [+];Croucher et al. 2002 [++]) suggest that South Asians of Bangladesh heritage within the UK use smokeless tobacco products for reasons relating to tradition and cultural heritage, as well as using smokeless tobacco as part of a habitual practice that has a deeply rooted social component. Evidence indicated that it is simply a habit and part of a daily routine (Croucher et al. 2002 [++]; Summers et al. 1994 [+]), and many peers used, although more males than females indicated they liked the taste of the products ($p<0.001$) (Bedi & Gilthorpe 1995 [+]). Habits could lead to addiction, and this was noted as a reason for chewing in 14% of a Bangladeshi sample in Tower Hamlets (Pearson et al. 1999 [+]).

Evidence statement 38: Reasons for chewing- mental and physical health

Evidence from two UK reports (HDA 2000 [+]; Rees 2007 [+]), and three UK cross-sectional studies (Pearson et al. 1999 [+]; Summers et al. 1994 [+]; Croucher et al. 2002 [++]) suggest that South Asians use paan to relieve stress, boredom, or relax (HDA 2000 [+]), although traditional Hindu messages suggested that paan aids digestion, freshens the breath and strengthens the heart (Rees 2007 [+]). Twenty-two percent of Bangladeshi women from Yorkshire found chewing paan pleasant and refreshing, while 12% believed chewing had positive health benefits or could aid in digestion (11%), oral hygiene (20%), or help with pain (6%), as well as serve to make lips more attractive (Summers et al. 1994 [+]). Evidence suggested that Bangladeshi women sampled within Tower Hamlets believed paan was good for their teeth (22.3%, 23/103), and 12.6% (13/103) found it refreshing (Croucher et al. (2002 [++]), Evidence, also from a Tower Hamlets sample, confirms perceptions of paan being useful for dental pain management, a digestion and refreshment aid (Pearson et al. 1999 [+]).

Evidence statement 39: Knowledge of health risks

Moderate evidence from two UK reports (HDA 2000 [+]; Rees 2007 [+]), and five UK cross-sectional studies (Ahmed et al. 1997 [+]; Pearson et al. 1999 [+]; Summers et al. 1994 [+]; Vora et al. 2000 [+]; Croucher et al. 2002 [++]) investigated knowledge of health risks of smokeless tobacco use. South Asian focus group participants hadvery little understanding of paan health risk, due to cultural traditions overshadowing thoughts of risks, and participants (especially older Bangladeshis) believed paan had little effect on health, but some dental concerns were noted (HDA 2000 [+]). Paan

was believed to be helpful in masking oral pain, aiding in oral hygiene, thus resulting in people not visiting a dentist for oral symptoms (Rees 2007 [+]). Strong evidence suggests 10.8% (10/93) of Bangladeshi respondents from Tower Hamlets believed chewing was good for your health, and 89% (83/93) believed it was bad for health (Croucher et al 2002 [++]). Also, 62% of first generation Bangladeshi women from Yorkshire thought chewing was good for their health, 20% believed it was negative for health, 13% neither good nor bad, and 5% did not know (Summers et al. 1994 [+]). According to research set within Tower Hamlets, nearly half of men (48%, n=30) and women (59%, n=43) believed paan chewing could cause dental problems and perceptions of paan chewing linked to mouth cancer was suggested in 24% (15) of men and 36% (26) of women (Ahmed et al. 1997 [+]). In a Tower Hamlets Bangladeshi sample, 23% believed paan was good for health; 43% were unaware of health consequences, with females and heavier users less aware of the health risks (Pearson et al. 1999 [+]). Nearly 50% of first generation Asian males from Leicester were aware of oral cancer, but this was slightly lower among Sikhs; however, more second generations heard of oral cancer (Vora et al. 2000 [+]).

Evidence statement 40: Quitting

Strong evidence from two UK cross sectional studies (Croucher et al 2002 [++]; Croucher et al. 2007 [++]), and moderate evidence from three UK cross sectional studies (Ahmed et al. 1997 [+]; Pearson et al 1999 [+];Summers et al. 1994 [+]) was found while investigating views and desires for quitting smokeless tobacco. Seventy-two percent (66/92) Bangladeshi women from Tower Hamlets found it difficult to go without tobacco, although 80% (74/92) desired to quit, while 20% (18/92) did not intend to quit (Croucher et al 2002 [++]). Over 50% of Bangladeshi men from Tower Hamlets wanted to give up chewing tobacco, and many had attempted to quit (67- 86%). Around a third of people indicated it would be easy to go without tobacco (Croucher et al. 2007 [++]). According to a Yorkshire sample, light chewers (<10 quids/day) were more likely to quit paan than heavier users, although 39% would quitif advised by a medical professional (Summers et al. 1994 [+]). More Tower Hamlets Bangladeshi men (25%) than women (5%) had given up paan ($p < 0.01$) (Pearson et al 1999 [+]). According to research set in Birmingham, 9% of males (8) and only 4%
(4) females had given up their habit (Bedi & Gilthorpe 1995 [+]).

Evidence statement 41: Accessibility and purchasing

Moderate evidence from one UK report (Rees 2007 [+]), and three UK cross- sectional studies (Bedi & Gilthorpe 1995 [+]; Longman et al. 2010 [+];Prabhu et al. 2001 [+]) provided information regarding the accessibility of smokeless tobacco within the UK. Betel quid was purchased by mostly males (Bedi & Gilthorpe 1995[+]), and intended for use in the family setting, as 81% of teenagers acquired products from home (Prabhu et al. 2001 [+]). A land survey revealed that paan is easily available in Asian shops within the UK and few products comply with current legislation (Longman et al. 2010 [+]; Rees 2007 [+]). Leicester and Tower Hamlets had the highest concentration of premises (supermarkets, news agents, and music and book shops) selling products (Longman et al. 2010 [+]).

Evidence statement 42: Substitution for cigarettes

Moderate evidence from one UK qualitative paper (Croucher & Choudhury 2007 [+]) revealed younger Bangladeshi men from Tower Hamlets may use paan as a way to obtain tobacco without smoking cigarettes, although problems of addiction to smokeless tobacco may still be present, making quitting difficult.

What are the views of health professionals regarding smokeless tobacco?

Evidence statement 43: Awareness and advice by dentists

Moderate evidence from two UK cross-sectional survey studies (Csikar et al. n.d [+]; Nathan (2010 [+]) of dental professionals in the UK examined awareness and advice of dental professionals. Dentists from Harrow were almost twice as likely to neglect to offer areca cessation to patients than neglect to provide smoking tobacco cessation counselling, citing that awareness of the issues and lack of understanding of support needed was a barrier (Nathan (2010 [+]). Of dentists that were aware of oral health impacts caused by smokeless tobacco use, half believed that it was a significant problem for their patients and this was especially true for dentists in Bradford and Kirkless than Leeds (Csikar et al. n.d [+]).

Evidence statement 44: Barriers and support needed for practitioners

Moderate evidence from three UK cross-sectional survey studies (Csikar et al. n.d [+]; Nathan (2010 [+]; Pearson et al 1999 [+]) examined barriers and supported needed for counselling on smokeless tobacco. In a survey of Yorkshire dentists, 75%(279/372) wanted access to resources, and 32% (90/372) required information on discussing smokeless tobacco, 30% (84/372) for waiting room resources, 22%

(62/372) indicated assistance with oral cancer detection, and 15% (43/372) wanted training (Csikar et al. n.d [+]). Evidence by Nathan (2010 [+]) revealed that dentists had a lack of information about counselling, and many patients are in need, but dentists do not feel equipped to help. Ethnicity of dentists plays a role in counselling as 75% of Asian/African dentists were more likely to provide support than white dentists (43%) ($p < 0.006$) (Nathan (2010 [+]). Language barriers between South Asian clients and practitioners exist, as 73% of first generation Bangladeshi Tower Hamlets residences experienced language issues while visiting health professionals, with more females (94%) than males (58%) experiencing this problem ($p < 0.001$); resulting in only 20% registered with a dentist, and only 33% had visited a dentist in the past year, while 25% never visited a dentist (Pearson et al 1999 [+]).

What is the best way to target health information for South Asians?

Evidence statement 45: Targeting health information

Moderate evidence from two UK reports (HDA 2000 [+]; Rees 2007 [+]), and one study set in Leicester (Vora et al. 2000 [+]) examined targeting of health information for South Asians. Second generation South Asian males from Leicester noted sources of health knowledge included school/college education, the press and media(where majority heard about oral cancer), and health education leaflets (Vora et al. 2000 [+]). South Asians primarily receive health promotion messages from the Asian broadcast media and print media, and this should be used to highlight the healthrisks of smokeless tobacco, provided language issues and culturally appropriate design are used (HDA 2000 [+]). Drawing upon the experiences of members of the community (vignettes) and using religion could be useful in reaching South Asians (HDA 2000 [+]).

Areas for which no evidence was found

Do any factors determine the particular varieties used?

Evidence statement 46: Varieties used

There was no evidence identified through the review process to support this question.

What is the cost-effectiveness of interventions?

Evidence statement 47: Cost-effectiveness

The literature search did not identify any economic analyses of smokeless tobacco cessation interventions. Details of the economics aspect of this project can be found in the economics report.

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Prabhu NT, Warnakulasuriya K, Gelbier S, Robinson PG. 2001. Betel quid chewing among Bangladeshi adolescents living in east London. *International Journal of Paediatric Dentistry 11(1):18-24.*

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8. Appendices

Appendix 1: Search strategy

OVID SP
Database(s): Embase 1980 to 2011 Week 20
Search Strategy:

#	Searches	Results
1	Tobacco, Smokeless/	2213
2	smokeless tobacco.tw.	1540
3	dipping tobacco.tw.	1
4	chew* tobacco.tw.	437
5	snus.tw.	161
6	creamy snuff.tw.	1
7	(tobacco gum or gum tobacco).tw.	0
8	disolv* tobacco.tw.	0
9	tobacco paste.tw.	4
10	tobacco water.tw.	4
11	slaked lime.tw.	74
12	Areca/	1391
13	(betel or areca or catechu*).tw.	1641
14	gutka.tw.	27
15	khaini.tw.	23
16	pan masala.tw.	53
17	shammah.tw.	6
18	maras.tw.	55
19	zarda.tw.	18
20	qiwam.tw.	0
21	mawa.tw.	8
22	lal dantmanjan.tw.	0
23	gadakhu.tw.	0
24	gul.tw.	38
25	mishri.tw.	9
26	nass.tw.	331
27	oral tobacco.tw.	57
28	(quid and (tobacco or betel or acreca or catechu*)).tw.	602
29	(plug and (tobacco or betel or acreca or catechu*)).tw.	14
30	(spit and (tobacco or betel or acreca or catechu*)).tw.	43
31	1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 or 10 or 11 or 12 or 13 or 14 or 15 or 16 or 17 or 18 or 19 or 20 or 21 or 22 or 23 or 24 or 25 or 26 or 27 or 28 or 29 or 30	5192
32	(south asian or bangladeshi or pakistani or indian or kashmiri or punjabi).tw.	39679
33	(minority ethnic group* or BME).tw.	1002
34	(london or tower hamlets or newham or camden).tw.	21663
35	(birmingham or manchester or oldham or luton or bradford or newcastle or glasgow or huddersfield or nottingham or peterborough or slough or stoke or batley or derby or reading).tw.	106897
36	32 or 33 or 34 or 35	167636
37	31 and 36	300

Appendix 2: Included and excluded study lists

* Papers identified by NICE and Subject Experts

Question 1:

Anantha et al. 1995. Efficacy of an anti-tobacco community education program in India. Cancer Causes Control. Mar 6(2):119-29.

Bate et al. 2009. Psychosocial mediators of a school-based tobacco prevention program in India: Results from the first year of project MYTRI. *Prevention Science* 10 (2):116-128.

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*Croucher et al. 2011c. Predictors of successful short-term tobacco cessation in underserved UK resident female Bangladeshi tobacco chewers: a retrospective review. (No journal details provided. Not listed on PubMed).

Goenka et al. 2010. Process evaluation of
a tobacco prevention program in Indian schools--methods, results and lessons learnt. *Health Education Research* Dec 25 (6):917-35.

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Question 2:

Ahmed S, Rahman A, Hull S. 1997. Use of betel quid and cigarettes among Bangladeshi patients in an inner-city practice: prevalence and knowledge of health effects. *British Journal of General Practice.47(420):431-4.*

Bedi R and Gilthorpe MS. 1995. The prevalence of betel-quid and tobacco chewing among the Bangladeshi community resident in a United Kingdom area of multiple deprivation. *Primary dental care: journal of the Faculty of General Dental Practitioners* 2 (2):39-42.

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Croucher et al. 2002. Tobacco dependence in a UK Bangladeshi female population: A cross-sectional study. *Nicotine and Tobacco Research 4* (2):171-176.

Croucher RE, Islam SS, Pau AK. 2007. Concurrent tobacco use in a random sample of UK-resident Bangladeshi men. *Journal of Public Health Dentistry 67(2):83-8.*

*Csikar et al. No Date. Unpublished. Are Dental Teams Ideally Placed to Work with Smokeless Tobacco Users? Results from an exploratory survey in West Yorkshire.

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Vora AR, Yeoman CM, Hayter JP. 2000. Alcohol, tobacco and paan use and understanding of oral cancer risk among Asian males in Leicester. *British Dental Journal 188(8):444-51.*

Excluded study list

Discussion Papers, Background, No Data (n=14)

Ahluwalia KP. 2005. Assessing the oral cancer risk of South-Asian immigrants in New York City. Cancer 104(12 Suppl):2959-61.

Auluck A, Hislop G, Poh C, Zhang L., Rosin MP. 2009. Areca nut and betel quid chewing among South Asian immigrants to Western countries and its implications for oral cancer screening. Rural & Remote Health 9(2):1118, (June).

Bedi R. 1996. Betel-quid and tobacco chewing among the United Kingdom's Bangladeshi community. The British journal of cancer. Supplement 29 S73-S77.

Changrani J. and Gany F. 2005. Paan and Gutka in the United States: an emerging threat. Journal of Immigrant Health 7(2):103-8.

Croucher R, and Islam S. 2002. Socio-economic aspects of areca nut use. *Addiction Biology.7 (1)* 139-146.

Gupta PC. 1991Betel quid and oral cancer: prospects for prevention. *IARC Scientific Publications (105):466-70.*

Gupta PC. and Ray CS. 2003. Smokeless tobacco and health in India and South Asia. Respirology 8(4):419-31.

Nelson BS. and Heischober B. 1999. Betel nut: A common drug used by naturalized citizens from India, Far East Asia, and the South Pacific Islands. Annals of Emergency Medicine 34(2):238-243.

Nisar M I. and Iqbal R. 2011. Smokeless tobacco use prevention and cessation (S-TUPAC): a need of the time. Journal of the Pakistan Medical Association 61(7):711-712.

Panesar,SS., Gatrad R., and Sheikh A. 2008. Smokeless tobacco use by south Asian youth in the UK. Lancet 372(9633):97-8.

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West R, McNeill A, Raw M, and Health Development Agency for England. 196. Smokeless tobacco cessation guidelines for health professionals in England. British Dental Journal (10):611-618.

Williams S, Malik A, Chowdhury S, and Chauhan S. 2002. Sociocultural aspects of areca nut use. Addiction Biology 7(1):147-154.

Not South Asian, Not smokeless tobacco, or Not OECD countries (n=5)

Chen JR. Schroeder KL. 1987.An analysis of print and audiovisual materials to prevent smokeless tobacco use. *Journal of Cancer Education.2 (4)*:239-245.

Coan LL, Christen A, and Romito L. 2007. Evolution of a tobacco cessation curriculum for dental hygiene students at Indiana University School of Dentistry. Journal of Dental Education 71(6):776-784.

Farrand P. and Rowe R. 2006. Areca nut use amongst South Asian schoolchildren in Tower Hamlets, London: the extent to which the habit is engaged in within the family and used to suppress hunger. *Community dental health* 23 (1):58-60.

West,R. 2006. Tobacco control: Present and future. British Medical Bulletin 77-78(1):123-136.

Sorensen et al. 2005. Teacher tobacco use and tobacco use prevention in two regions in India: qualitative research findings. Preventive Medicine.41(2):424-32.

Focus on oral cancer and dental care (n=6)

Warnakulasuriya S. 2005. Bidi smokers at increased risk of oral cancer. Evidence-Based Dentistry 6(1):19.

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Shetty KV. and Johnson NW. 1999. Knowledge, attitudes and beliefs of adult South Asians living in London regarding risk factors and signs for oral cancer. *Community Dental Health.16(4):227-31.*

Williams SA, Summers RM, Ahmed IA, and Prendergast MJ. 1996. Caries experience, tooth loss and oral health-related behaviours among Bangladeshi women resident in West Yorkshire, UK. *Community Dental Health.13(3):150-6*.

Prevalence studies not reporting views (n=3)

Farrand P, Rowe,RM, Johnston A, and Murdoch H. 2001. Prevalence, age of onset and demographic relationships of different areca nut habits amongst children in Tower Hamlets, London. British dental journal190 (3):150-154.

Nunezde la,MA, JesmiF, and Bentley GR. 2007. Betel nut use among first and second generation Bangladeshi women in London, UK. Journal of Immigrant & Minority Health 9(4):299-306.

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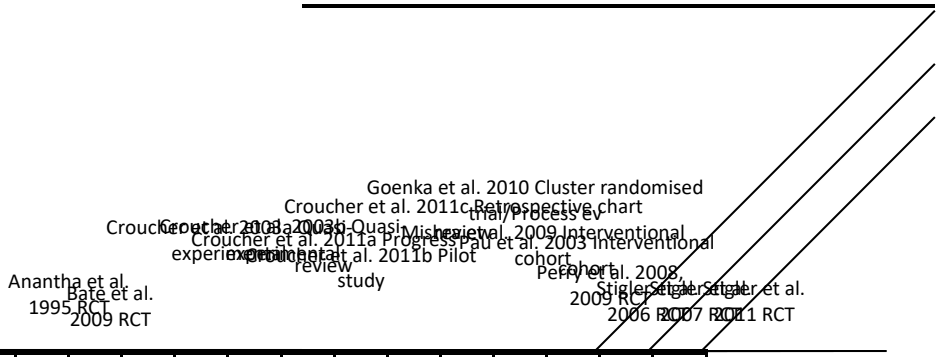
Appendix 3: Quality assessment using NICE checklist criteria for interventions



1.1	++	+	++	++	++	++	++	++	-	++	++	++	++	++
1.2	++	+	+	+	+	+	+	+	-	+	+	+	+	+
1.3	++	-	+	NR	NR	NR	NR	+	+	-	+	+	+	+
2.1	+	+	-	NR	NR	NR	NR	+	NA	-	+	+	+	+
2.2	-	+	NR	-	-	-	-	+	+	NR	+	+	+	+
2.3	NR	NR	NR	NR	NR	NR	NR	NR	NA	NA	NR	NR	NR	NR
2.4	NR	NR	NR	NA	NA	NA	NA	NR	NA	NA	NR	NR	NR	NR
2.5	-	+	+	+	+	+	+	+	+	+	+	+	+	+
2.6	NR	NR	NR	NA	NA	NA	NA	NR	NA	NR	NR	NR	NR	NR
2.7	NR	NR	NR	NR	NR	NR	++	NR	NA	NA	NR	NR	NR	NR
2.8	NR	NR	++	++	+	+	NR	++	NR	NR	-	-	-	-
2.9	+	-	++	++	++	++	++	-	-	++	-	-	-	-
2.10	+	-	++	++	++	++	++	-	-	++	-	-	-	-
3.1	-	-	++	+	+	+	+	-	-	-	-	-	-	-
3.2	NR	+	+	++	++	++	+	NR	+	+	NR	NR	NR	NR
3.3	+	-	++	++	+	+	+	+	+	+	+	+	+	+
3.4	++	++	++	++	+	+	+	+	+	+	+	+	+	+
3.5	++	NR	++	NA	NA	NA	NA	NR	NA	NR	NR	NR	NR	NR
3.6	++	+	+	+	+	+	+	NR	+	NR	+	+	+	+
4.1	+	NR	++	++	NA	NA	NA	NR	-	NA	+	NR	NR	NR
4.2	NR	-	NR	++	NR	NR	NR	NR	+	+	++	++	++	NR
4.3	NR	NR	+	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR	NR
4.4	NR	-	+	+	-	+	+	+	-	+	NR	NR	NR	++
4.5	NR	+	+	-	NR	NR	+	+	-	NR	NR	+	NR	-
4.6	+	+	+	+	+	+	+	+	+	NR	+	+	+	++
5.1	+	-	-	-	-	-	-	-	-	-	-	-	-	-
5.2	+	+	+	+	-	+	+	+	-	+	+	+	+	+
Qual	+	+	+	+	-	+	+	+	-	+	+	+	+	+

Intervention tool questions:

Section 1: Population
1.1 Is the source population or source area well described?
1.2 Is the eligible population or area representative of the source population or area?
1.3 Do the selected participants or areas represent the eligible population or area?
Section 2: Method of Allocation to intervention (or comparison)
2.1 Allocation to intervention (or comparison). How was selection bias minimised?
2.2 Were interventions (and comparisons) well described and appropriate?
2.3 Was the allocation concealed?
2.4 Were participants and/or investigators blind to exposure and comparison?
2.5 Was the exposure to the intervention and comparison adequate?
2.6 Was contamination acceptably low?
2.7 Were other interventions similar in both groups?
2.8 Were all participants accounted for at study conclusion?
2.9 Did the setting reflect usual UK practice?
2.10 Did the intervention or control comparison reflect usual UK practice?
Section 3: Outcomes
3.1 Were outcome measures reliable?
3.2 Were all outcome measurements complete?

3.3 Were all important outcomes assessed?
3.4 Were outcomes relevant?
3.5 Were there similar follow-up times in exposure and comparison groups?
3.6 Was follow-up time meaningful?
Section 4: Analyses
4.1 Were exposure and comparison groups similar at baseline?
4.2 Was Intention to treat (ITT) analysis conducted?
4.3 Was the study sufficiently powered to detect an intervention effect (if one exists)?
4.4 Were the estimates of effect size given or calculable?
4.5 Were the analytical methods appropriate?
4.6 Was the precision of intervention effects given or calculable? Were they meaningful?
Section 5: Summary
5.1 Are the study results internally valid (i.e. unbiased)?
5.2 Are the findings generalisable to the source population (i.e. externally valid)?

Key to all quality assessment overall scores:

++: All or most of the checklist criteria have been fulfilled, where they have not been fulfilled the conclusions are very unlikely to alter.

+: Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.

–: Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

Appendix 4: Quality assessment using NICE checklists for associations and correlations

	Ahmed et al 1997	Bedi & Giltorpe 1995	Croucher et al 2002	Croucher et al 2007	Csikar et al Date	Longman et al 2010	Nathan 2010	Pearson et al 1999	Prabhu et al 2001	Summers et al 1994	Vora et al 2000
1.1	+	-	+	++	+	++	+	+	+	+	++
1.2	+	+	+	+	+	+	+	+	+	+	+
1.3	+	+	+	+	+	+	+	+	+	+	+
2.1	+	+	+	+	+	NA	+	+	+	+	+
2.2	NA	NA	+	+	-	NA	NA	NA	NA	NA	NA
2.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
2.4	+	-	+	+	-	-	-	-	+	-	+
2.5	++	++	++	++	++	++	++	++	++	++	++
3.1	-	-	++	++	-	+	-	-	+	-	-
3.2	+	+	+	+	+	+	+	+	+	+	+
3.3	+	+	++	++	+	+	+	+	+	+	+
3.4	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3.5	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4.1	-	-	++	++	-	-	-	+	-	-	-
4.2	NA	NA	+	+	NA	NA	NA	NA	NA	NA	NA
4.3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
4.4	+	+	++	++	-	NA	NA	+	+	+	+
5.1	+	-	++	++	-	-	-	+	+	-	+
5.2	+	+	++	++	+	+	+	+	+	+	+
Qual	+	+	++	++	+	+	+	+	+	+	+

* Rees (2007) was not quality assessed using NICE checklists since it was a report brief with little primary research; however, it was judged by both reviewers to be a reasonable quality [+] piece of work based on reporting of aims and objectives, findings, conclusions.

Correlation and association tool questions:

Section 1: Population
1.1 Is the source population or source area well described?
1.2 Is the eligible population or area representative of the source population or area?
1.3 Do the selected participants or areas represent the eligible population or area?
Section 2: Method of selection of exposure (or comparison) group
2.1 Selection of exposure (and comparison) group. How was selection bias minimised?
2.2 Was the selection of explanatory variables based on a sound theoretical basis?
2.3 Was the contamination acceptably low?
2.4 How well were likely confounding factors identified and controlled?
2.5 Is the setting applicable to the UK?
Section 3: Outcomes
3.1 Were the outcome measures and procedures reliable?
3.2 Were the outcome measurements complete?
3.3 Were all the important outcomes assessed?
3.4 Was there a similar follow-up time in exposure and comparison groups?
3.5 Was follow-up time meaningful?
Section 4: Analyses
4.1 Was the study sufficiently powered to detect an intervention effect (if one exists)?
4.2 Were multiple explanatory variables considered in the analyses?
4.3 Were the analytical methods appropriate?
4.6 Was the precision of association given or calculable? Is association meaningful?
Section 5: Summary
5.1 Are the study results internally valid (i.e. unbiased)?
5.2 Are the findings generalisable to the source population (i.e. externally valid)?

Quality assessment using NICE checklists for qualitative studies

Study	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Overall
Croucher & Choudhury	+	+	-	+	++	+	+	+	+	++	+	+	+	+	+
HDA 2000	+	+	-	+	+	+	+	+	+	+	+	+	+	+	+

Qualitative Tool questions:

Theoretical approach
1. Is a qualitative approach appropriate?
2. Is the study clear in what it seeks to do?
Study Design
3. How defensible/rigorous is the research design/methodology**?**
Data collection
4. How well was the data collection carried out?
Trustworthiness
5. Is the role of the researcher clearly described?
6. Is the context clearly described?
7. Were the methods reliable**?**
Analysis
8. Is the data analysis sufficiently rigorous?
9. Is the data 'rich'?
10. Is the analysis reliable?
11. Are the findings convincing?
12. Are the findings relevant to the aims of the study?
13. Conclusions: Is there adequate discussion of any limitations encountered?
Ethics
14. How clear and coherent is the reporting of ethics?
Overall Assessment
As far as can be ascertained from the paper, how well was the study conducted

Key to all quality assessment overall scores:

++: All or most of the checklist criteria have been fulfilled, where they have not been fulfilled the conclusions are very unlikely to alter.

+: Some of the checklist criteria have been fulfilled, where they have not been fulfilled, or not adequately described, the conclusions are unlikely to alter.

–: Few or no checklist criteria have been fulfilled and the conclusions are likely or very likely to alter.

Appendix 5: Evidence tables

Question 1: Interventions

Study Details	Population and Setting	Methods	Findings
Anantha et al., 1995 **Study design**: RCT and survey **Location**: India **Recruitment**: The study was conducted in one experimental and two control areas of Kolar District (population [pop] = 1.9 million [1981 Census]) in Karnataka State (pop = 37 million) of India. The district of Kolar was selected because of the proximity of the district to Bangalore. Three areas under the purview of the Primary Health Centers of Dibbur, Malur, and Gudibanda comprising 117, 136, and 120 villages, respectively, were chosen on the basis of a fair degree of comparability of prevalence of the tobacco habit, availability of educational facilities, and socioeconomic	**Number of participants**: Participants were representative of three areas under the purview of the Primary Health Centers of Dibbur (pop=60,447), Malur (pop=64,202), and Gudibanda (pop=46,878) **Mean Age**: NR **Gender**: NR **Ethnicity**: NR **Marital status**: NR **Socio-economic status**: **Baseline comparability**: At baseline the type of tobacco habit of the population in the experimental area and in the two control areas shows some	**Intervention**: n=117 villages located in Dibbur (pop=60,447) **Delivered by**: Twenty-five junior health-workers of the Primary Health Center and three senior health-workers were involved in health education. Each junior health-worker would cover each village under his/her care once a week, and the senior health-worker once a month. Health education was imparted to individuals or small groups by the junior health-worker, whereas group discussions which were held once a month, were conducted usually in the presence of the senior health-worker. **Setting**: Community-based **Content**: ▪ *Handbills--Summary* about harmful effects of tobacco on health. About 2,000 handbills were used. These were distributed by the health workers to households with literate persons; ▪ *Folders--Brief* explanation about tobacco-habit formation and misconceptions about tobacco messages. About 500 folders were distributed by the health workers to persons such as community leaders in the village; ▪ *Card* (4"× 3") with photographs of advanced cancers of the oral cavity on both sides. A health worker could carry this card easily in his/her pocket and use it during person-to-person contact in the community. Each health worker carried a card which was replaced whenever necessary with a fresh one. Approximately 100 cards were used; ▪ *Photo album* with 28 postcard-size photographs with appropriate captions and messages on harmful effects of tobacco and about cancer. Just as with the cards, one photo album was used by each	**OUTCOME MEASURES** **Pre-intervention measures** **Baseline prevalence rates** ▪ The prevalence rates in percent of tobacco users during the baseline survey in the experimental area were higher in both males and females compared with that in control area I and control area II. Females showed a higher prevalence of tobacco use compared with males in experimental and control areas. Examination of the prevalence rates after stratifying according to villages did not show any marked difference. ▪ The baseline age-specific prevalence-rates of the tobacco habit for the population in the three areas did not show any variation among males. In females, the age-specific curves in the control areas were lower. **Baseline prevalence of type of tobacco** ▪ At baseline the type of tobacco habit of the population in the experimental area and in the two control areas shows some variation. The experimental area showed 16.4% of tobacco chewers at baseline compared with 7.7% and 8.4% chewers in control area I and control area II respectively. ▪ Similarly, the experimental area showed 17.7% smokers compared with 21.0% and 21.7% in control area I and control area II respectively. **Post-intervention measures** ▪ There was a decline in prevalence rates between the baseline survey and final survey. The decline in the prevalence of chewing in males in the experimental area was statistically significant (P < 0.0001) for the results in all samples of the first repeat survey and for that of combined sample and panel sample in the final survey, but not significant in the non-panel sample of control area I (P = 0.06). Similarly, for smoking, the results of the panel sample in first repeat survey were not significant (P=0.3). Otherwise, all the remaining samples in both first repeat survey and final survey showed a statistically significant (P < 0.001) decline in the prevalence rates of

infrastructure. Dibbur was chosen as the experimental area (ExA), and Malur and Gudibanda as control areas I (CoAI) and II (CoAII), respectively. **Objective**: To evaluate the impact of tobacco education on tobacco-habit prevalence rates, the number and rates of persons who had quit the habit, and the rate of uptake of the habit by prior non-users of tobacco. **Length of Follow Up**: The study was carried out over a six-year period between February 1986 and March 1992. **Randomisation**: A stratified random-sampling method was used to select the villages. **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: NR	variation. **Inclusion Criteria**: NR **Exclusion Criteria**: NR	health worker. In all, 40 photo albums were used; ▪ *Portable display boards* with messages about harmful effects of tobacco and photographs on cancer. Two sizes of boards one small (15 '1 × 12 n) and the other larger (41 × J) were used for groups discussions. Four sets of these boards were used; ▪ *Audiovisual aids* including 16 mm feature films--These consisted of two separate films (duration 10 minutes each) on smoking and the other on chewing in four languages (English, Kannada, Hindi, and Telugu); ▪ --All materials were also prepared in the form of a video casette along with another video cassette titled 'Cancer is curable' with highlights on primary prevention of cancer, basic knowledge on its treatment and terminal care of cancer patients. ▪ Films were screened at least twice during the period of intervention, in each of the 117 villages in the experimental area. **Duration/timing**: ▪ The intervention commenced soon after the completion of the baseline survey and lasted for about three years. **Assessment**:. ▪ The survey was carried out three times. The first survey was defined as the 'baseline survey' (BLS) and was carried out before undertaking any educational programs. The second survey was called 'first repeat survey' (FRS) and was done two years after education was imparted to the community covered by the ExA. The 'final survey' (FS) was made three years after the FRS. ▪ The actual survey was done in two sets of selected villages in the three areas. The first set referred to as 'panel sample' (PS) consisted of 10 villages in the ExA, five villages in CoAI, and 11 villages in CoAII. The population in these villages, comprising the PS in the experimental and control areas, was surveyed all three times during baseline, first repeat, and final surveys. ▪ The second set of villages referred to as the 'non-panel sample' (NPS) consisted of 47 villages in ExA, 32 villages in CoAI, and 34 villages in CoAII. These villages in the NPS were defined as those villages which were surveyed only once during any of the other surveys. Thus, of the 47 villages mentioned in the ExA, 19 were chosen for BLS, I4 for FRS, and another 14 for FS. ▪ Similarly, the number of villages chosen during the three surveys, respectively, for CoAI were 10, seven, and 15, and for CoAII were 17, eight, and nine. ▪ The method of choosing one set of villages as PS and another set as NPS was done to ensure as much coverage of the population as was possible while at the same time to observe the impact of	smoking. ▪ Tests for a declining trend in prevalence rates in experimental area from baseline to final survey, indicated a statistically significant trend only for the panel sample in males when the tobacco habit was considered as a whole (chewing and smoking) (P=0.03) and in the PS for male smokers (P < 0.004). ▪ The prevalence rates of the final survey also were compared with that of the first repeat survey, and tests for statistical significance were carried out. Only the results of the panel sample showed a statistically significant decline during the final survey compared with the first repeat survey. ▪ Age-specific prevalence rates in the experimental area showed a decrease from baseline to the first repeat survey (to a larger extent) and that of final survey (to a smaller extent) indicating a decline in the prevalence rates in almost all age groups. ▪ Among males, the shift of the age-specific chewing rates was greater than the age-specific smoking rates. This effect was seen clearly during the first repeat survey, but not as well demonstrated during the final survey, except in the younger age groups of the panel sample. ▪ Curves of the age-specific prevalence rates of the tobacco-habit status during the three surveys showed little or no change in the two control areas in both genders. **Quit rates** ▪ The numbers and rate of persons who had quit ('quit ratio') the habit at the time of first repeat survey was much higher in the experimental area--where intervention through health education was given—compared with the control areas (in males, 26.5 percent in experimental area *3.2* percent and 1.1 percent in control area I and control area II, respectively; and in females, 40.7 percent in experimental area *2.4* percent and 0.2 percent in control area I and control area II, respectively). ▪ Comparison of the quitters' rate between first repeat survey and final survey showed a decline in the quitters' rate in the experimental area, although the actual quitters' rate itself was far higher than in the control areas. Stratification according to the panel sample and non-panel sample gave a different picture of the difference in the quitters' rate between first repeat survey and final survey. The results of the panel sample showed an increase in the quitters' rate by 12.4 percent in males and 7.6 percent in females in the experimental area, whereas there was a decline by 9.2 percent and 12.4 percent in the quitters' rate in males and females, respectively, in the non-panel sample. A slight increase in the quitters' rate also was observed in the control areas in the panel sample but the reverse holds true for those villages in the non-panel sample. ▪ The influence of age on quitting the habit was examined by generating graphs of age-specific quitters' rates during the first repeat survey and final survey. No variation with age group.

		education on people in one set of villages. The results from the NPS also eliminates any bias that may be associated with the results in the PS from repeated tobacco surveys in the same population. This needs to be emphasized, since the ▪ PS was not exposed to any deliberate or planned intervention *vis-a-vis* the villages under the NPS. **Control**: n=2 control areas (consisting of Malur (pop= 64,202) and Gudibanda (pop=46,878); comprising 136 and 120 villages, respectively.	▪ No significant differences were found between quitters and non-quitters and the mean of the duration of the habit. **Initiation rates** ▪ The baseline initiation rates among males were comparable in experimental and control areas, but were somewhat different among females. In the experimental area, the initiation rate dropped in both males and females, but more in the latter, during the first repeat survey, but increased in the control areas. ▪ During the final survey, the initiation rate was higher than during the first repeat survey among males in the two control areas and also in females in control area I. Stratifying initiation rates into panel sample and non-panel sample gave very small numbers for any meaningful correlation. For the same reason of small numbers, age-specific initiation rates could not be calculated. ▪ The initiation rates in the experimental area showed a statistically significant decline in males ($P < 0.01$) and females ($P = 0.005$) during first repeat survey. In the final survey, males in control area I did not show a statistically significant decline in the initiation rate ($P = 0.16$), but comparison with control area II and the final survey results in females showed a significant decline ($P \sim 0.005$). ▪ Among males, the initiation rates of tobacco chewing and smoking were compared. In the experimental area, during the final survey the initiation rate of chewing was 0.2 percent and that of smoking 0.1 percent. In control area I, the initiation rate of chewing was 0.1 percent compared with 0.3 percent for smoking. In control area II, these were 0.4 percent and 0.9 percent for chewing and smoking respectively. **Impact of health education material used** ▪ Three types of health communication methods were used. First, was the method which could be read by the literate population. The second was the audio-visual means which could be understood by almost all the persons who saw it. The last was inter-personnel communication, with the health worker actually explaining the contents of the messages and describing the photo albums and identity cards that they carried. ▪ There was no noticeable difference in the proportion of quitters exposed to reading material and inter-personal communication compared to the proportion non-quitters who were exposed. ▪ However, with regard to the audio-visual means of education, during the first repeat survey, 68.6 percent of quitters had an opportunity to view the films on chewing and smoking compared with 57 percent of non-quitters of either gender. During the final survey, 95.7 percent of quitters had viewed the films compared with 90 percent of non-quitters.

Bate et al. 2009 **Study design**: RCT and survey **Location**: India **Recruitment**: Participating schools were selected based on their representativeness of the range of schools in Delhi and Chennai in terms of socioeconomic level, school type and gender. **Objective**: To investigate whether the Mobilizing Youth for Tobacco—Related Initiatives in India (MYTRI) altered the psychosocial risk factors as intended, and whether the changes in psychosocial risk factors were, in turn, responsible for altering students' tobacco-use intentions. **Length of Follow Up**: 1-year. **Randomisation**: Thirty-two schools were randomized to receive the intervention (n=16 schools) or serve as a delayed program control (n=16 schools). Method not described **Allocation Concealment**: NR **Blinding**: NR	**Number of participants**: 8,369 6th and 8th graders **Mean Age**: The average age of students in 2004 was 11.0 years for 6th graders and 12.8 years for 8th graders. **Gender**: 51.6% male; 48.4% female **Ethnicity**: NR **Marital status**: NA **Socio-economic status**: 56.4% of the students attended Government schools. Students from Government schools were generally from low-to-middle SES backgrounds, while Private school students generally came from middle-to-high SES backgrounds. In the survey sample, 43.5% lived in Delhi (in northern India), and 56.5% lived in Chennai (in southern India). **Baseline comparability**: NR **Inclusion Criteria**:	**Intervention**: n=4,009 in 16 schools **Delivered by**: Teachers and peer leaders **Setting**: Schools **Content**: ▪ Intervention components consisted of: (1) Classroom curricula, (2) School posters, (3) Parent postcards, and (4) Peer-led health activism. ▪ The first-year curriculum included seven, 70-minute classroom sessions. The curricula were adapted from activities implemented in previous social influence programs, such as the Minnesota Smoking Prevention Program. ▪ The classroom curricula involved games, competitions, and other activities that were designed to be fun and interactive. Activities were conducted in small groups of 10 to 15 students and were led by student elected peer leaders who received training prior to classroom sessions. ▪ Teachers and peer leaders were provided with instruction manuals and students worked from handbooks. Materials were provided in English, Hindi, or Tamil, depending on the primary language at each school. ▪ The curriculum included knowledge components, skills building, and normative education, and focused on altering the psychosocial risk factors. The program content addressed numerous forms of tobacco use, including cigarettes, chewing tobacco, and bidis. ▪ To complement classroom activities and reinforce student learning, themed posters that corresponded to session topics were hung inside classrooms and elsewhere on school grounds. Postcards with curriculum-related messages were hand delivered by students to parents. In addition, intra- and inter school activities and competitions were held. **Duration/timing**: ▪ In year one, the intervention spanned 4 months and involved 15 h of activity. The first-year curriculum included seven, 70-minute classroom sessions. **Assessment**: ▪ Two surveys were considered in the mediation analysis: (1) a baseline survey in 2004 prior to program implementation when students were in 6th and 8th grades and (2) a 1-year follow-up in 2005 when the original students were in 7th and 9th grade.	**OUTCOME MEASURES** A mediation model is a path model that specifies a hypothesized causal chain between independent (X), dependent (Y), and mediating (M) variables. Using a series of regression equations, statistical mediation analysis tests the X→M→Y relation, designating the independent variable as affecting a mediating variable which in turn affects the dependent variable (MacKinnon et al. 2002a). Briefly, an effect was said to be mediated if (i) the program had a statistically significant effect on the hypothesized mediator, (ii) the hypothesized mediator was associated with the desired outcome after controlling for the intervention effect, and (iii) the mediated effect was statistically significant (MacKinnon 2008). Generally, a significant program effect (X→Y) is also considered a requirement for mediation to occur (Baron and Kenny 1986; Judd and Kenny 1981). However, opposite signs of the coefficients representing the effects of X→M and M→Y could result in a non-significant program effect due to canceling yet still produce a significant mediated effect (MacKinnon et al. 2000). Thus, a significant program effect is not always a necessary condition for mediation, and was not a requirement in the current analyses. **Single Mediator Models** The single mediation model results indicated that significant program effects (τ) were observed for Intentions to Chew (t=−2.16, p=.04) but not for Intentions to Smoke (t=−1.85, p=.07). Fourteen single mediator models were estimated for each outcome—Intentions to Chew and Intentions to Smoke. Mixed-effects regression models were used in order to account for multilevel data, since students were nested within schools and intra-class correlation coefficients indicated clustering among students. The α coefficients associated with the action theory showed that Project MYTRI altered only certain psychosocial mediators. Psychosocial risk factors significantly altered by Project MYTRI included: ▪ Knowledge of Health Effects ▪ Knowledge of Tobacco Control Policy ▪ Normative Beliefs ▪ Reasons to Use Tobacco ▪ Reasons Not to Use Tobacco ▪ Self-efficacy in Advocacy Skills Holding constant all factors but treatment group, mediator scale scores for

Intention-to-treat: NR **Loss to follow up**: ▪ There was a 31.5% attrition rate for students in the control condition and a 24% attrition rate for students in the intervention group. No other details related to withdrawals or attrition were reported. **Funding**: Project MYTRI is a collaborative effort between researchers and practitioners in the U.S. and India, and is funded by the Fogarty International Center 2002–2007 as part of a larger initiative to build capacity for conducting tobacco control research worldwide.	NR **Exclusion Criteria**: NR	▪ The sample size of students who completed both the baseline and 1-year follow-up surveys was N=8,369. ▪ Outcome measures were assessed using an adapted version of the Global Youth Tobacco Survey (GYTS) developed by the WHO (World Health Organization) and the CDC (Centers for Disease Control and Prevention), as well as prior instruments used by the study investigators. ▪ "Intentions to chew tobacco" and "Intentions to smoke tobacco" were selected as the two outcome variables used in the mediation analyses. ▪ Intervention objectives included: (1) Increase knowledge about health effects of tobacco use, (2) Change values, meanings, beliefs about tobacco use, (3) Increase skills to resist social influences to use tobacco, (4) Promote tobacco-free social norms in schools and homes, (5) Increase exposure to healthy, tobacco-free role models, (6) Provide support for others to abstain/quit using tobacco, (7) Provide opportunities to support tobacco control policies. ▪ Two raw scale scores (one for intentions to chew and one for intentions to smoke) were created. ▪ The possible range of scores was 0 to 12, with a higher score indicating less risk (fewer intentions). ▪ Composite scale scores were created to represent each of the 14 psychosocial risk variables that corresponded to those specified by the behavioral model as the targeted mediators of the intervention. ▪ Each composite variable consisted of three to eight questions. Composite variables were formed in a manner similar to the intentions scale scores. Separate scores were computed on 14 psychosocial risk factors for the baseline and one-year follow up, making 28 risk factor scale scores in total. **Control**: n=4,360 in 16 schools No information regarding the control condition components was reported.	these psychosocial risk factors were higher (meaning less risk) for students in the intervention group compared to those in the control condition. Psychosocial risk factors NOT significantly altered by Project MYTRI included: ▪ Beliefs about Social Consequences ▪ Normative Expectations ▪ Self-Efficacy in Refusal Skills ▪ Support for Tobacco Control Policy ▪ Social Susceptibility to Chewing ▪ Social Susceptibility to Smoking **Multiple Mediator Models** Multi-level multiple mediator models were also estimated separately for the Intentions to Chew and Intentions to Smoke outcome variables. The models included only the psychosocial mediator variables that were identified as statistically significant in the single mediator models. Perceived Prevalence of Smoking was excluded from the Intentions to Chew multiple mediator model due to the high correlation between Perceived Prevalence of Chewing and Perceived Prevalence of Smoking (r=.68); the multicollinearity resulting from the inclusion of both prevalence predictors impeded interpretation of program effects. Similar to the single mediator models, the ANCOVA method was used to handle repeated measures, and the model adjusted for gender, grade, school type, and region. Nine single mediators were identified and their mediated effects in the multiple mediation model were calculated. In the multiple mediator model scenarios, Project MYTRI had a significant program effect on Intentions to Chew, but not on Intentions to Smoke. Similar to the single mediator models, multiple mediation analysis for Intentions to Smoke was still performed in order to gain insight into the action and conceptual theories. The estimate of the total mediated effect for Intentions to Chew was −.13 ($se_{\alpha^*\beta}$=.02) and was significant (Z′=10.35). Significant mediating psychosocial risk factors for Intentions to Chew included: ▪ Knowledge of Health Effects ▪ Normative Beliefs ▪ Reasons to Use Tobacco ▪ Perceived Prevalence of Chewing The proportion mediated was highest for Normative Beliefs (18% of the total mediated effect), followed by Knowledge of Health Effects (10%), Perceived Prevalence of Chewing (7%), and Reasons to Use Tobacco (6%). The estimate of the total mediated effect for Intentions to Smoke was −.14 ($se_{\alpha^*\beta}$=.04) and was also significant (Z′=−3.98). The same four risk factors that

			were significant mediators for Intentions to Chew were significant for Intentions to Smoke with the addition of Perceived Prevalence of Smoking. Normative Beliefs again had the highest proportion mediated (29% of the total mediated effect), followed by Perceived Prevalence of Chewing (13%), Reasons to Use Tobacco (12%), Perceived Prevalence of Smoking (9%), and Knowledge of Health Effects (4%). These results indicated that Project MYTRI increased students' perceptions of the prevalence of chewing and smoking tobacco use, which subsequently increased students' intentions to (respectively) chew and smoke tobacco in the future. Perceived Prevalence of Chewing was a significant mediator for Intentions to Smoke, but not an inconsistent mediator; the positive α and negative β paths meant that Project MYTRI increased students' perceptions of how common it was for people to chew tobacco, but these increases in students' prevalence beliefs about chewing tobacco use actually decreased students' risk of using smoking tobacco in the future. Separate multiple mediator models by grade level showed fewer significant mediators for 8th graders than 6th graders. For 6th graders, significant mediators for Intentions to Chew were Susceptibility of Chewing (p=.05), Normative Beliefs (p=.01), and Knowledge of Health Effects (p=.01). The proportions mediated for those variables were 57%, 13%, and 11%, respectively. For the 8th Grade Intentions to Chew model, only Normative Beliefs (p=.01) and Knowledge of Health Effects (p<.01) were significant mediators. The proportions mediated were 22% and 8%, respectively. However, the total mediated effect was significant for the 6th Grade model (−.17, se=.05, Z′=−3.41) but not for the 8th Grade model (−.10, se=.06, Z′=−1.65). Statistics for total proportion mediated indicated the mediated effects for the 6th Grade sample accounted for a greater portion (100%) of the program effect between Project MYTRI and Intentions to Chew than for the 8th Grade sample (84%).
Croucher et al. 2003a **Study design**: Quasi-experimental **Location**: UK **Recruitment**: A series of presentations, by bi-lingual (Sylheti/ English) female researchers, to	**Number of participants**: 130 Bangladeshi females residing on two housing estates in the London Borough of Tower Hamlets. **Mean Age**: 42.5	**Intervention**: n=65 **Delivered by**: Bi-lingual research workers. **Setting**: Housing estates in Tower Hamlets, London. **Content**: ▪ The intervention group received a weekly supply of NRT patches along with brief advice and encouragement. ▪ The content of 'brief advice and encouragement' was based upon the recommended content of opportunistic interventions delivered	**<u>OUTCOME MEASURES</u>** **Changes in salivary cotinine scores** ▪ The mean (SD) salivary cotinine score at baseline was 337.4 (224.8) for the whole group. ▪ Baseline mean (SD) salivary cotinine scores were 370.4 (252.7) for the NRT group, and 304.4 (234) for the brief advice and encouragement group. ▪ Final assessment mean (SD) salivary cotinine scores were 248.8 (SD=233) for the whole group, 225 (SD=206.2) for the NRT group and 272.6 (SD =256.4) for the brief encouragement and advice group.

neighbourhood groups were made as part of an integrated local strategy, developed with a community in East London. The recruitment strategy included health education campaigns with the community to raise risk awareness, and chewing tobacco suppliers (retailers and wholesalers) to address compliance with the existing legislative and regulatory framework with respect to the labelling and sale of tobacco products. **Objective**: To establish the short-term outcomes for successful tobacco cessation of a programme offering UK resident Bangladeshi women chewing paan with tobacco, recruited through community groups, NRT in addition to brief advice and encouragement alone. **Length of Follow Up**: Participants in the control condition were followed-up 4 weeks later at the end of the study. No other details regarding length of follow-up were provided. **Randomisation**: The participants were systematically assigned to one of two groups (NRT or brief advice). Pairs of participants were matched	**Gender**: females **Ethnicity**: Bangladeshi **Marital status**: NR **Socio-economic status**: NR **Mean Number of paan quid tobacco chewed daily**: 10.7 **Mean Age of starting tobacco chewing**: 24 years **% tobacco chewers alone**: 93 **% tobacco chewers and smokers**: 7 **Baseline comparability**: Participants in both groups matched at baseline for age, daily number of paan quid with tobacco chewed and age of starting to add tobacco to the paan quid. **Inclusion Criteria**: Participants were included in the investigation if they were aged between 18 and 60 years, expressed a strong wish to give up tobacco use, and	routinely by health professionals, typically asking participants about current use of tobacco, advising them to consider stopping tobacco use, offering assistance and arranging a follow-up. ▪ Each participant receiving NRT was assessed at this time, and adverse effects and withdrawal symptoms recorded. Further brief encouragement was offered to the participants receiving NRT at each assessment. **Pharmacological Therapies**: NRT patches (Nicorette 15 mg; Pharmacia-Upjohn) were supplied weekly for up to 4 weeks to participants in the NRT group. **Duration/timing**: ▪ The intervention lasted 4 weeks. **Assessment**: ▪ At recruitment, participants completed a previously piloted structured interview. The interview contained questions about aspects of tobacco use and degree of dependence upon tobacco. ▪ Self-reported tobacco use was validated by assessment of salivary cotinine levels using gas chromatography. Cotinine is the principal metabolite of nicotine. ▪ Participants provided saliva by keeping a cotton-wool dental roll in the mouth until saturated. The use of saliva sampling was adopted following a community consultation, which indicated that this would facilitate better participation than the alternatives of providing blood or urine samples. ▪ Expired air carbon monoxide concentrations were also measured, using a Bedfont Smokerylser, to identify tobacco smokers. ▪ The interview instrument was translated into Bengali and independently re-translated into English to establish equivalence of meaning. The two Sylheti speaking female community workers conducted the recruitment interviews in the preferred language of the respondents. They were also responsible for the distribution of the NRT patches and follow-up activity during the investigation. ▪ After 4 weeks a second sample of saliva for cotinine analysis was taken from all remaining participants, and data about withdrawal symptoms and adverse effects collected from the NRT group alone. ▪ Decisions about user categories and successful tobacco cessation were as adopted for our earlier prevalence study. Participants with a salivary cotinine score greater than 15 ng/ml were identified as continuing tobacco chewers or smokers at follow-up. **Control**: n=65	▪ The difference in salivary cotinine scores between baseline and final assessment for the whole group was significant (t =5.3, P= 0.0). ▪ There was no significant difference in salivary cotinine scores between the NRT and the brief advice and encouragement groups (t= 1.1, P =0.27) at final assessment. ▪ At the final assessment, after 4 weeks, 23 participants had completely stopped tobacco use, measured by their self-report and a salivary cotinine score below the threshold level. ▪ Thirteen (22%) participants had received the NRT, whilst 10 (17%) participants had received brief advice and encouragement alone. ▪ Changes in salivary cotinine scores at final assessment, after adjusting for baseline, were greatest for those successfully using NRT compared to those complying with brief advice and encouragement and those who had reduced their cotinine scores from either group. These changes were statistically significant. **Successful participants** ▪ Successful participants from the NRT group were younger (36.9 versus 39.5 years) than the successful members of the brief advice and encouragement alone group. ▪ Successful participants from the NRT group also started adding tobacco to the paan quid at an earlier age (22.8 versus 29 years), to chew more paan quid with tobacco daily (5.9 versus 2.8), were more likely to have the first paan quid with tobacco within 2 h of waking (54 versus 40%) and to use leaf tobacco in the paan quid (54 versus 40%). ▪ For most withdrawal symptoms, the majority of participants from the NRT group reported either ‘none’ or ‘mild’ ratings. The most common withdrawal symptom rated as ‘severe’ in this group was craving, reported by 22% of the unsuccessful and 10% of the successful participants. ▪ No differences in the rating of reported withdrawal symptoms were statistically significant. ▪ Few successful or unsuccessful participants from the NRT group reported severe adverse effects. ▪ The successful were twice as likely to report severe skin reactions (20 versus 10%) and sleep disturbance (10 versus 5%) than the unsuccessful. ▪ At final assessment, 62% (73 of 118) of all participants reported oral pain.

on age (within 12 months of either side) and number of paan with tobacco chewed daily. No additional information regarding randomization was provided. **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: ▪ Data relating to adverse effects and withdrawal symptoms was not available for eight and six participants, respectively. ▪ After 4 weeks, at final assessment, 118 (91%) participants were still taking part. ▪ Of the 12 that were lost, two changed their mind about participation after recruitment, three reported being unwell and seven could not be contacted for their final assessment appointment. ▪ No other details related to withdrawals were reported. **Funding**: This work was supported by a grant made available through the NHS Executive North Thames Region Inner City Health research programme. S. I. is an MRC	were willing to try using NRT (nicotine replacement therapy). **Exclusion Criteria**: Participants assigned to the NRT group also completed a medical screening questionnaire to exclude those for whom NRT was contra-indicated. The main exclusion criteria were a history of severe cardiovascular disease, hypertension or diabetes, current use of psychotropic medication and pregnancy or breast feeding. Those excluded from using NRT on these grounds were assigned to the brief advice and encouragement group.	Participants assigned to the control condition received brief advice and encouragement alone on one occasion at the start of the intervention. In this study, those receiving brief advice and encouragement alone were advised of the risks of chewing tobacco, encouraged to give up and advised that their progress would be followed up 4 weeks later. This information was offered to participants by the bi-lingual research workers who had recruited the participants. At the completion of the study, those members of the brief advice and encouragement group, who were not medically excluded from receiving NRT, were offered supplies of NRT patches and ongoing weekly support.	

Health Services Research Fellow.			
Croucher et al. 2003b **Study design**: Quasi-experimental **Location**: UK **Recruitment**: Adult Bangladeshi women aged 18 years and older recruited into a four-week tobacco with paan cessation program were invited to participate in this study, which was carried out between January and May 2002. Participants were recruited, using a standard protocol, from community centers, referrals by other health workers, and referrals by existing participants. Those interested were given information about the study. They were told that taking part involved completing interviews before entry into the tobacco cessation program and at regular follow-ups after entry into the program. They were also told that their mouths would be screened for any dental, gingival, or soft tissue problems. Those choosing not to take part in the study remained in the tobacco cessation program. **Objective**: To assess the	**Number of participants**: 52 Bangladeshi females **Mean Age**: 42.8 **Gender**: females **Ethnicity**: Bangladeshi **Marital status**: NR **Socio-economic status**: NR **Mean Number of paan quid tobacco chewed daily**: 13 **Baseline comparability**: The baseline oral examination showed that adults aged 40 years and older had poorer oral health compared to those aged 18-39 years. These older adults were significantly more likely to have higher numbers of teeth with recession, abrasion, loss of attachment greater than 3.5 mm, and loss of attachment greater than 5.5 mm. Those in the older age group were also	**Intervention**: n=52 **Delivered by**: Bi-lingual research workers. **Setting**: Community-based **Content**: ▪ One trained and calibrated dentist carried out an oral examination in a dental teaching hospital. ▪ Before the examination, participants were asked a set of questions about their medical history in relation to any risk that the examination may pose. ▪ After the examination, participants entered the tobacco with paan cessation program. An individual quit date was agreed upon with the participant. ▪ Nicotine replacement therapy patches were supplied by mail *to* reach the participant before the quit date, usually one week after recruitment into the cessation program. ▪ Participants were contacted on a weekly basis during the program, at which time any adverse effects and withdrawal symptoms would be discussed, encouragement to continue cessation provided, and further nicotine replacement therapy patches supplied. **Pharmacological Therapies**: ▪ Nicotine replacement therapy (Nicorette@15 mg, Pfizer) patches were supplied by mail *to* reach the participant before the quit date, usually one week after recruitment into the cessation program. **Duration/timing**: ▪ The intervention lasted 4 weeks. **Assessment**: ▪ Interviews were conducted in Sylheti at baseline by one female Bangladeshi researcher using fully structured questionnaires. ▪ At baseline, before entry into the tobacco cessation program, data were collected on: (1) Age and number of daily paan. (2) Oral pain status and characteristics. The questionnaire asked about the presence of pain in the teeth, mouth, and face regions, its intensity, frequency, any provoking factors, and associated symptoms. ▪ Oral health status using the World Health Organization (WHO) screening criteria for type and site of OMLs, and the UK Adult	**<u>OUTCOME MEASURES</u>** **Oral Mucosal Lesions** ▪ Eleven of the OMLs were located in the buccal mucosa, three on the alveolar ridge, two were on multiple sites, and one on the lips. ▪ The prevalence of oral pain at baseline was 26.9%. At the one-week follow-up, it had increased to 51.9%. ▪ There were 18 new cases of self-reported pain at the one-week follow-up compared to baseline. ▪ The increase in the number of new cases of pain was statistically significant (Wilcoxon signed ranked test, P=.007). ▪ Results of the simple logistic regression carried out to predict new cases of pain at the one-week follow-up showed that participants with an OML at baseline were over four times more likely to report oral pain at the one-week follow-up (odds ratio [OR]=4.06; 95% confidence interval [CI]=1.20,13.78; P=.025). ▪ None of the other measures (age, number of paan-with-tobacco chewed daily, oral health status) were significant. Post-menopausal status did not predict the reporting of new cases of pain. ▪ The results of the stepwise multiple logistic regression analysis confirmed that OML at baseline was the only significant predictor of new cases of oral pain (OR=3.66; 95% CI=1.06, 12.62; *P*= .04). ▪ At the completion of the four-week cessation program, 42 participants remained and 79% of these reported successful paan-with-tobacco cessation. (OR~1.139; 5% CI=.665, 14.48; P=.15). .

oral health status of a sample of UK resident Bangladeshi women tobacco-in-paan users and its relationship to participant age and number of daily paan, to determine the prevalence of oral pain at baseline and at the one-week post-cessation follow-up, and to explore the relationship between oral health status and changes in self-reported oral pain at baseline and at the one-week post-cessation follow-up. **Length of Follow Up**: One week follow-up after entering the programme. **Randomisation**: No randomisation procedure performed. All participants volunteered to participate in the tobacco cessation programme. No additional information was provided. **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: NR **Funding**: Partially funded by the East London Tobacco Cessation	significantly more likely to have an oral mucosal lesion (OML) at baseline. Of the 18 OMLs identified, nine were ulcers, four had lichen planus-like appearance, two were white patches (leukoplakia), two were dental abscesses, and one was an epithelial polyp. **Inclusion Criteria**: NR **Exclusion Criteria**: Terminally ill, psychiatric patients, and those with learning disabilities were excluded, as were tobacco smokers.	Dental Health Survey criteria for decayed, missing, or filled teeth, recession, abrasion, loss of attachment, and tooth wear. ▪ One week after the quit date, as part of the standard cessation program protocol, the participants were followed up through a telephone interview. The following data were collected: (1) chewing status, (2) oral pain status and characteristics ▪ Frequency distributions of age, number of daily paan, oral health status, and self-reported oral pain are presented. ▪ Comparison of oral health status between young and older adults was carried out using the Mann-Whitney U and chi-squared tests. ▪ The prevalence of oral pain at baseline was compared to that at the one-week follow-up. The Wilcoxon signed rank test was carried out to determine whether the increase in the number of new cases of pain was significant. ▪ Simple logistic regression analyses were carried out to predict new cases of pain at the one-week follow-up from measures of age, number of daily paan, decayed and filled teeth, teeth with abrasion and loss of attachment greater than 3.5 mm, and the presence of an OML. A further logistic regression was undertaken to see whether sex-specific hormones might predict the reporting of new cases of pain. The current UK norm for onset of menopause of 51 years was adopted for this analysis. ▪ Finally, a stepwise multiple logistic regression analysis was carried out to identify the best predictors of oral pain post-cessation. **Control**: No defined control group. Data analysis compare oral health of volunteers $\geq$ 40 years to volunteers aged 18-39 years.	

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<td>Services.</td>
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<td>Croucher et al. 2011a

Study design: Progress review

Location: UK

Recruitment: The period of recruitment started between October 2010 and January 2011. 143 (57.6%) clients were recruited from Tower Hamlets, 75 (30.2%) from Leicester and 30 (12.1%) from Bradford.

Objective: To address the current evidence gap with respect to providing smokeless tobacco cessation support, recognising the need to assess the scaleability of the principles underpinning projects like the Bangladeshi Stop.

Length of Follow Up: NR

Randomisation: NR

Allocation Concealment: NR

Blinding: NR

Intention-to-treat: NR

Loss to follow up: Self-reported quit success after four weeks, in the 229 clients who have reached</td>
<td>Number of participants: 248 Bangladeshi females residing in three localities in Tower Hamlets, Leicester and Bradford, UK.

Mean Age: 45.7

Gender: 70.0% females

Ethnicity: 70.0% Bangladeshi

Marital status: NR

Socio-economic status: NR

Mean daily chewing frequency: 9.4

Mean nicotine dependency score: 10.4

Baseline comparability: NR

Inclusion Criteria: NR

Exclusion Criteria: NR</td>
<td>Intervention: n=248

Delivered by: NR

Setting: Housing estates in Tower Hamlets, London

Content: NRT with behavioural support.

Pharmacological Therapies:
NRT patches and gum

Duration/timing:
▪ The intervention lasted 4 weeks.
Assessment: Quit success and adverse events

Control: NR</td>
<td><u>OUTCOME MEASURES</u>

Quit attempt process and outcome
▪ 88% of clients chose nicotine replacement therapy (NRT) and behavioural support.
▪ Of those using NRT, 62% used combination NRT (patch & gum).
▪ Self-reported quit success after four weeks, in the 229 clients who have reached this stage in their quit attempt, was 54%.
▪ Self-reported quit success varies between localities (Tower Hamlets = 61.7%, Leicester = 52.2% and Bradford = 26%).
▪ At the time of the progress report, 14 saliva samples for cotinine analysis had been collected.

Withdrawal symptoms and adverse events

Weekly withdrawal symptoms* reported by clients (n=236)
<table>
<tr><th></th><th>WEEK 2</th><th>WEEK 3</th><th>WEEK 4</th><th>WEEK 6</th></tr>
<tr><td>Clients reporting withdrawal symptoms</td><td>78% (n=200)</td><td>67% (n=200)</td><td>53.9% (n=191)</td><td>33% (n=188)</td></tr>
<tr><td>Mean (SE) withdrawal symptoms</td><td>2.12 (0.14)</td><td>1.76 (0.13)</td><td>1.43 (0.13)</td><td>0.89 (0.11</td></tr>
</table>
▪ Of the 236 clients for whom data is currently available, about 80% have experienced nicotine withdrawal symptoms of short duration, which reduce progressively.
▪ The mean (SE) number of withdrawal symptoms reduced significantly from Week 2 (2.12, SE=0.14) to Week 6 (0.89, SE=0.11) [p=0.005].
▪ The most commonly reported symptom is ‘a craving (or desire) to chew’.
▪ Clients with higher nicotine dependence scores experience more withdrawal symptoms.
▪ There was no significant variation in withdrawal symptoms by age or gender.</td>
</tr>
</table>

this stage in their quit attempt, was 54%. Within those not successfully quitting 9% were lost to follow up.

Funding: The Department of Health, Tobacco Control Health Inequalities Pilot Programme and is run under the auspices of the UK Centre for Tobacco Control Studies at Nottingham.

Withdrawal and dependency

Comparison of weekly mean withdrawal symptom scores with mean dependency score

Mean Dependency score	Category	Mean (SE) withdrawal symptom score	Significance
Week 2 (n=196)	Below Mean	1.8 (0.2)	0.026
	=/Above Mean	2.44 (0.19)	
Week 3 (n=196)	Below Mean	1.47 (0.19)	0.033
	=/Above Mean	2.04 (0.18)	
Week 4 (n=187)	Below Mean	1.13 (0.18)	0.033
	=/Above Mean	1.71 (0.18)	
Week 6 (n=184)	Below Mean	0.60 (0.15)	0.018
	=/Above Mean	1.15 (0.17)	

- Clients with higher (above mean) dependency scores experienced significantly more withdrawal symptoms throughout the cessation process.
- No significant association was identified between type of NRT product

and mean number of withdrawal symptoms.

Adverse events

Weekly NRT-related adverse events* reported by clients

Mean (SE)	WEEK 2	WEEK 3	WEEK 4	WEEK 6
Clients reporting Adverse events	77.9% (n=204)	68.1% (n=204)	47.5% (n=200)	28% (n=200)
Mean (SE) adverse events	2.10 (0.12)	1.65 (0.11)	1.08 (0.11)	0.57 (0.08)

- Adverse events have also been reported by 78% of clients who used NRT, especially in the early weeks of quitting. For most clients these events were of short duration and like withdrawal symptoms, reduce progressively during the cessation process.
- The mean (SE) number of adverse events reduced significantly from Week 2 (2.10, SE=0.12) to Week 6 (0.57, SE=0.08) [p=0.018].
- The most frequently reported adverse event is 'oral pain'.
- Clients using combination forms of NRT report a higher number of adverse events in the early weeks of quitting.
- Male clients reported significantly more adverse events (Mean=2.90, SE=0.31) than females (Mean=1.89, SE=0.13) at week 2 [p=0.001].
- Clients who were prescribed a single NRT product experienced significantly fewer NRT-related adverse events at weeks 2, 3 and 4, as compared to clients who were prescribed a combination of NRT products.

- Adverse events included: vivid dreams, rash, nausea/vomiting/diarrhoea, sleep disturbance, headache, restlessness, dry mouth, indigestion/heartburn, weakness, hiccups and oral discomfort/tooth pain/throat irritation.

Weekly mean numbers of adverse events and NRT used

Adverse events	Type of NRT	Mean (SE)	Significance
Week 2 (n=194)	Single product	1.54 (0.19)	0.001
	Combination	2.47 (0.16)	
Week 3 (n=194)	Single product	1.31 (0.19)	0.021
	Combination	1.90(0.15)	
Week 4 (n=190)	Single product	0.80 (0.15)	0.041
	Combination	1.28 (0.15)	
Week 6 (n=190)	Single product	0.38 (0.10)	0.088
	Combination	0.68 (0.11)	

Associations of successful quit attempt

Client Gender and Self-reported Quit Attempt Status (n=236)

Gender	Not Quit N (%)	Quit N (%)
Female	68 (40.5)	100 (59.5)
Male	40 (58.8)	28 (41.2)

P=0.01

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Client Mean Age and Self-reported Quit Attempt Status (n=236)
<table>
<tr><td>Mean age (years)</td><td>Not Quit N (%)</td><td>Quit N (%)</td></tr>
<tr><td>Below mean</td><td>52 (42.6)</td><td>70 (57.4)</td></tr>
<tr><td>Above mean</td><td>56 (49.1)</td><td>58 (50.9)</td></tr>
</table>
P=0.317

Mean dependency score and Self-reported Quit Attempt Status (n=221)
<table>
<tr><td>Dependency score</td><td>Not Quit N (%)</td><td>Quit N (%)</td></tr>
<tr><td>Below mean</td><td>44 (45.4)</td><td>53 (54.6)</td></tr>
<tr><td>Above mean</td><td>53 (42.7)</td><td>71 (57.3)</td></tr>
</table>
P= 0.697

Mean withdrawal symptom scores (week 2) and Self-reported Quit Attempt Status (n=191)
<table>
<tr><td>Withdrawal symptoms score</td><td>Not Quit N (%)</td><td>Quit N (%)</td></tr>
<tr><td>Below mean</td><td>29 (23.4)</td><td>95 (76.6)</td></tr>
<tr><td>Above mean</td><td>41 (61.2)</td><td>26 (38.8)</td></tr>
</table>
P=0.0005

Mean number of adverse events (week 2) and Self-reported Quit Attempt Status (n=236)
<table>
<tr><td>Adverse Events</td><td>Not Quit N (%)</td><td>Quit N (%)</td></tr>
<tr><td>Below mean</td><td>42 (32.8)</td><td>86 (67.2)</td></tr>
<tr><td>Above mean</td><td>33 (49.3)</td><td>34 (50.7)</td></tr>
</table>
P=0.025

▪ Women were more likely to make a successful quit attempt
▪ Client age was not related to a successful quit attempt
▪ Level of dependency was not related to final quit attempt status
▪ Clients reporting lower mean withdrawal symptom scores at Week 2 were more likely to make a successful quit attempt
▪ Clients reporting lower mean adverse events at Week 2 were more likely to make a successful quit attempt
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<tr>
<td>Croucher et al. 2011b

Study design: Pilot study

Location: UK

Recruitment: The period of recruitment started between October 2010 and April</td>
<td>Number of participants:
203 clients residing in three localities in Tower Hamlets, Leicester and Bradford, UK.

Mean Age: 45.2</td>
<td>Intervention: n=203

Delivered by: Bi-lingual outreach workers

Setting: Housing estates

Content: NR

Method: A literature review was conducted to inform the design of</td>
<td><u>OUTCOME MEASURES</u>

Quit attempt and process outcomes
▪ The mean number of contacts was 4.4 (range 1-7).
▪ 94% used NRT in their quit attempt, more likely a combination of products (patch & gum).
▪ Male clients more likely received combination NRT (p=0.005).
▪ 4% were lost to follow up.
▪ 62% reported a successful quit attempt at four weeks.</td>
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2011. No other details provided. **Objective**: To (1) review the current evidence base for cessation support for smokeless tobacco users, sharing the outcomes with an advisory group to identify opportunities for implementing locality specific smokeless tobacco cessation services; (2) pragmatically pilot these services in two new locations alongside those already offered by the Bangladeshi Stop Tobacco Project (BSTP) activity in East London, assessing their effectiveness, acceptability and accessibility amongst clients; (3) develop a best practice checklist for incorporation into any practical and affordable service delivery in areas where smokeless tobacco use is high. **Length of Follow Up**: NR **Randomisation**: NR **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: 4% were lost to follow up.	**Gender**: 80% females **Ethnicity**: 77% Bangladeshi **Marital status**: NR **Socio-economic status**: NR **Mean daily chewing frequency**: 9.97 **Mean nicotine dependency score**: 4.39 **Baseline comparability**: NR **Inclusion Criteria**: NR **Exclusion Criteria**: NR	smokeless tobacco cessation support. A retrospective review of the BSTP client database, providing data on quit attempts (April 2005-December 2009) by smokeless tobacco users, was also undertaken. Using this information bi-lingual community outreach cessation workers (one full or part time equivalents) were embedded in each new location (NHS Bradford & Airedale, Leicestershire Partnership NHS Trust) for a consecutive period of no more than 12 months. Following selection the workers', training needs were assessed and updated, particularly in relation to implementing the service model. Their roles were to offer smokeless tobacco users from communities of South Asian origin smokeless tobacco quit support. After setting quit dates clients were offered NRT weekly for up to 12 weeks and their progress was monitored weekly using pilot specific schedules incorporating questions from validated inventories. Service promotion activity included presentations to primary and secondary health care teams as well as community members. **Pharmacological Therapies**: NRT **Duration/timing**: 4 weeks **Assessment**: NR **Control**: NR	▪ The client sub-sample reported being either 'satisfied' (36.5%) or 'very satisfied' (63.5%) with the support they had received for their quit attempt. 97% would recommend the service to other smokeless tobacco users and 97% would return to the service for any future quit attempt. ▪ Clients were more likely 'very' satisfied if men (p=0.035) and with below mean Week 2 AE (p=0.016). ▪ Self-reported quit success is being validated with salivary cotinine analysis. ▪ To date 41 samples have been collected and submitted for analysis. Initial technological problems lead to four samples being excluded. ▪ Of those samples returned 57% have confirmed self-reported quit status. ▪ Clients report the collection procedure as 'comfortable'. **Withdrawal symptoms and adverse events** ▪ Age, gender and ethnicity were not related to quit success, initial withdrawal symptoms (WS) and adverse events (AE) or dependency. ▪ ▪ Clients with above the mean number of contacts were more likely to report a quit attempt success (p=0.01) whilst those with below mean contacts more likely reported fewer WS (p=0.02), fewer AE (p=0.006) and lower dependency (p=0.001). ▪ Mean WS reduced significantly from 2.1 (Week 2) to 0.89 (Week 6) (p=0.005). ▪ Higher dependence was significantly associated with more WS at Week 2 (p=0.031) whilst fewer WS at Week 2 was significantly associated with a successful quit attempt (p=0.005). ▪ Mean NRT related adverse events (AE) reduced from 2.08 at Week 2 to 0.58 at Week 6 (p=0.005)). ▪ 78% reported AE at Week 2, most commonly oral pain and discomfort. ▪ Fewer NRT related AE at Week 2 were significantly associated with a successful quit attempt (p=0.028) whilst those reporting oral pain and discomfort at Week 2 were less likely to make a successful quit attempt (p=0.034). ▪ Combination NRT correlated with Weeks 2, 3 & 4 AE (p=0.001, 0.032, 0.027) but not Week 6 AE (p=0.069). ▪ Binary logistic regression modelling, controlling for age and gender, showed that craving reported at Week 2 was 2.49 times (95% CI 1.29, 4.78) more likely to predict an unsuccessful quit attempt whilst oral pain and discomfort at Week 2 was1.96 times (95% CI 1.04, 3.68) more likely to predict an unsuccessful quit attempt.

Funding: NR			
Croucher et al. 2011c **Study design**: A retrospective review of client records. **Location**: UK **Recruitment**: This was a retrospective review of client records generated from female paan with tobacco chewers who had accessed the services of a dedicated, locally commissioned and geographically circumscribed smokeless tobacco cessation service, the Bangladeshi Stop Tobacco Project (BSTP), between April 2005 and September 2009. Recruitment locations included local GP practices and health centres, as well as, community and faith centres, shops and schools. At these locations, a BSTP worker talked informally to individuals or small groups, proactively tailoring their contact to raise awareness of the health and social impacts of smokeless tobacco use, gaining the trust of potential clients and inviting a cessation attempt. **Objective**: To investigate predictors of successful	**Number of participants**: n=419 **Mean Age**: 48.9 **Gender**: females **Ethnicity**: Bangladeshi **Marital status**: NR **Socio-economic status**: NR **Mean Number of paan quid tobacco chewed daily**: 9.96 **Mean Age of starting tobacco chewing**: 20.9 years **Baseline comparability**: Preliminary analysis identified no significant difference between the clients included and excluded from the analysis in terms of their mean age (48.9 vs. 49.4 years, t=0.530, p=0.59) and mean Index of Multiple Deprivation score (3.65 vs. 3.16, t=1.115, p=0.266). **Inclusion Criteria**: NR	**Intervention**: n=419 **Delivered by**: Three female BSTP workers. **Setting**: An English tobacco cessation service offering a tailored approach to support smokeless tobacco cessation. **Content**: ▪ BSTP workers adopted the outreach principles proposed for accessing populations not readily reached through mainstream, conventional methods. ▪ BSTP workers identified key informants within the community who enabled their access to informal client networks which may otherwise be overlooked. ▪ Clients who started a cessation attempt received one-to-one support, on a weekly basis, for up to 12 weeks. ▪ Each session, about 15 minutes in length, incorporated strategies identified as supporting tobacco cessation. ▪ The BSTP workers provided letters of recommendation, on a weekly basis contingent upon the client reporting continued abstinence, to pharmacists for clients using NRT. **Pharmacological Therapies**: NRT: acute and sub-lingual forms (gum, lozenge, micro-tab and inhalator); patch therapy and combination NRT. **Duration/timing**: ▪ The intervention lasted 4 weeks. **Assessment**: ▪ Thirty-nine variables comprised the data set, grouped as demographics, tobacco use and dependence and tobacco cessation process and outcomes. ▪ Participant age was collected as a continuous variable and re-categorised into four groups. ▪ Post codes were used to determine participant local authority ward of residence and this was then translated into the area Index of Multiple Deprivation score. ▪ Number of previous quit attempts was grouped into three categories (never, 1-5 times, 6 times or more). ▪ One dependency question, the number of paan without tobacco per day, was initially adapted from the Fagerstrom Test for Nicotine Dependency (FTND). It was later augmented by two additional	**OUTCOME MEASURES** ▪ The mean number of daily paan with tobacco chewed was 9.96 (95% CI= 9.22, 10.70) with a range from 1 to 48. ▪ Nearly half (45.7%) chewed more than 10 paan with tobacco daily followed by 31.3% who chewed 5 to 9 paan with tobacco daily whilst. 23.1% chewed fewer than 5 paan with tobacco daily. ▪ The mean age for starting paan-with-tobacco use reported by 299 clients in the study sample was 20.94 years (95% CI=19.76, 22.12), ranging from 5 to 63 years. ▪ Participant age did not predict number of daily paan with tobacco chewed daily whilst clients who chewed above the median daily paan with tobacco were significantly more likely to have started their chewing at an earlier age (19.28 years [95% CI=17.71, 20.85] vs 22.52 years [95% CI=20.79, 24.25] p= 0.007). ▪ Area level of deprivation was not significantly related with frequency of daily paan with tobacco chewing. ▪ The mean overall dependency score was 5.29 (95% CI= 5.06, 5.51). Overall dependency scores did not vary significantly by age, age of starting tobacco, level of area deprivation and number of previous quit attempts. ▪ Those participants chewing more paan with tobacco daily were significantly more likely to have higher levels of dependency (p=0.00). ▪ Most (53.4%) participants reported making one to five previous attempts to quit tobacco use previously while 29.7% reported having never made any and 16.9% reported making more than five previous quit attempts. ▪ Just over half (58.2%) of participants self-reported continuous tobacco cessation at the end of four weeks. ▪ The mean age of those successfully stopping tobacco use at four weeks was significantly higher (p=0.028) than the mean age of those who were unsuccessful (50.17 years [95% CI=44.84, 48.98] vs. 46.91 years [95% CI=48.27, 52.07]). ▪ The mean age of starting tobacco use comparing those successfully and unsuccessfully stopping was not statistically significant (p = 0.499). ▪ Participants chewing fewer daily paan with tobacco, who were recruited from community centres and who were prescribed and used NRT to support their cessation attempt were significantly more likely to make a successful cessation attempt at four weeks whilst level of dependency, level of deprivation and number of previous cessation attempts were not significantly related to a successful cessation attempt. ▪ There was no significant difference in the types of NRT used to support the cessation attempt. ▪ Separate analysis showed that participants prescribed a combination of

short-term smokeless tobacco cessation in women from a disadvantaged and underserved community. **Length of Follow Up**: NR **Randomisation**: Clients were self-selected with limited prior screening and or exclusion of participants. **Allocation Concealment**: No random allocation to treatment was done. **Blinding**: The cessation support workers were not blinded to the different treatments selected. **Intention-to-treat**: NR **Loss to follow up**: NR **Funding**: Funding for this study has been received as part of the Department of Health's Tobacco Control Inequalities Consortium. The Bangladeshi Stop Tobacco Project is funded by NHS Tower Hamlets.	**Exclusion Criteria**: Participants were excluded if they were unable to provide informed consent, were pregnant, breast-feeding mothers or had serious systemic illnesses.	questions, chewing paan with tobacco even when ill in bed and how soon after waking was the first paan with tobacco consumed (within 30 minutes, 31-60 minutes, more than 60 minutes). ▪ An overall dependence score was calculated by collating responses to these questions and grouping this into three categories. ▪ Scores could range from 3 (low dependence) to 8 (high dependence). ▪ Participant recruitment method was entered as one of primary health care, friends and family or at a community centre. ▪ Type of intervention was dichotomised as either (1) behavioural support alone or (2) behavioural support and NRT. BSTP workers' advice, including NRT prescribing patterns and types of NRT used by the participants were also recorded on a weekly basis, over a four week period. ▪ Participant self-reported abstinence was recorded dichotomously each week ('yes' or 'no') and continuous abstinence during treatment was calculated. ▪ It was assumed that those lost to follow-up were still chewing tobacco. ▪ No validation of abstinence was undertaken. **Control**: NR	NRT had a significantly (p=0.001) higher mean dependency score (6.14, 95% CI=5.49, 6.79) compared to participants prescribed patch therapy alone (5.5, 95% CI=4.61, 5.25) or acute and sublingual forms of NRT alone (4.93, 95% CI=4.61, 5.25). ▪ Participants who received NRT and behavioural support as compared to behavioural support alone (OR=5.38, 95% CI=2.71-10.70, p=.001), who were more likely recruited from community centres (OR=1.84, 95% CI=1.01-3.35, p=.017), who were living in relatively less deprived areas (OR=1.98, 95% CI=1.17-3.32, p=.01) and chewed fewer daily paan with tobacco (OR=1.84, 95% CI=1.11-3.05, p=.018) were significantly more likely to have made a successful cessation attempt at four weeks.
Goenka et al. 2010 **Study design**: Cluster randomised trial/Process evaluation **Location**: India **Recruitment**: NR	**Number of participants**: All students (n = 5,564; 2,823 in Delhi and 2,741 in Chennai) of the sixth and eighth grades in these schools participated in the intervention.	**Intervention**: n=16 schools; 8 in Delhi and 8 in Chennai; 4 schools in each city were private and four were state-funded or government schools. The student peer leaders (781 of which, 402 were from Delhi and 379 from Chennai) and 125 teachers (67 in Delhi and 58 in Chennai) delivered the intervention. **Delivered by**: Teachers and student peer leaders	**<u>OUTCOME MEASURES</u>** **Intervention effectiveness** ▪ The proportion of teachers trained in a school correlated with better implementation of objectives (r = 0.58, P < 0.02), teacher's script (r = 0.57, P < 0.02), student's script (r = 0.53, P < 0.05), worksheets (r = 0.56, P < 0.02) and superior peer leaders–student communications (r = 0.75, P < 0.001) as documented by Objective Systematic Structured Observations (OSSOs). It was also of greater benefit in lowering the susceptibility to chewing tobacco (r = 0.53, P < 0.05).

Objective: To describe the process evaluation of this tobacco prevention program in Indian schools. **Length of Follow Up**: No details regarding length of follow-up were provided. **Randomisation**: Through a group-randomized trial design, 32 schools located in two large cities in India (n = 16 in Delhi and n = 16 in Chennai) were recruited, matched and randomly assigned to receive a 2-year tobacco preventive intervention or serve as a delayed intervention control. No additional information regarding randomization was provided. **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: ▪ Data relating to adverse effects and withdrawal symptoms was not available for eight and six participants, respectively. ▪ After 4 weeks, at final review, 118 (91%) participants were still taking part. ▪ Of the 12 that were lost, two changed their mind	**Mean Age**: NR **Gender**: NR **Ethnicity**: NR **Marital status**: NA **Socio-economic status**: The students in the private schools were from higher income backgrounds. No other information regarding socio-economic status was reported. **Baseline comparability**: NR **Inclusion Criteria**: NR **Exclusion Criteria**: NR	**Setting**: School-based **Content**: ▪ The Mobilizing Youth for Tobacco—Related Initiatives in India (MYTRI) intervention was entirely Indian in its content, context, communication (both textual and pictorial) and delivery. Theoretically, it was based on the social cognitive theory and the existing evidence-based smoking prevention programs, as a frame of reference. ▪ The intervention consisted of a classroom curriculum, school posters, parent postcards and training of the intervention implementers. The implementers were the teachers and student peer leaders. *The classroom curriculum—structure* ▪ It consisted of seven different classroom sessions. ▪ Each session was of 35–60 min each, initiated and implemented by the usual classroom teachers and peer leaders. ▪ Each classroom session had a common pre-defined multi-component structure consisting of the following intra-session elements: a written text of learning objectives, teacher's script, students' script, games, worksheets, discussion and wrap-up. ▪ Peer leaders and teachers interacted with the students to deliver the intervention. ▪ Student and peer leader involvement was intricately woven throughout the curriculum. ▪ Each session specific poster provided the launch pad and complimented the content of that classroom session. *The classroom curriculum—content* ▪ The seven different classroom sessions, posters and parent postcards focused on imparting behavioral skills and contextual knowledge to decrease their susceptibility to taking up tobacco in the future. ▪ In a pre-activity before the first session, Project MYTRI and the mascots Disha and Deepak were introduced and the students elected their own peer leaders in each class. ▪ 'Classroom session 1' used puzzles and worksheets show the burden of tobacco use and the different types of tobacco products used: zarda, beedi, khaini, gutka, hookah, panmasala and snuff. ▪ 'Classroom session 2' familiarized the children with the various harmful ingredients that are present in tobacco and which are common to poisons/harmful substances like insecticides, pesticides, naphthalene balls, nuclear weapons, etc. There were two jigsaw puzzle games for this session. ▪ 'Classroom session 3' covered the various long- and short-term health consequences of tobacco use (smoked and smokeless	▪ OSSOs revealed that the 'learning objectives' and 'teacher's script' were relatively the least often conducted among the various components/elements, making them the differentiating variable between the well-implemented and the less well-implemented interventions. [On an average, learning objectives were conducted 51% (4–96%, standard deviation (SD) = 30), the teacher's script 68% (17–100%, SD = 30) and games 91% (73–100%, SD = 11) of the times.] ▪ The 'rigor of implementation', which consisted of the percentage of these intra-session element delivered, namely learning objectives, students' script, teacher's script, games, worksheets and wrap-up, as documented by objective observations, therefore correlated most strongly with the implementation of the learning objectives (r = 0.90, P<0.0001) and teacher's script (r = 0.95, P < 0.001). ▪ On 91 occasions when the 'learning objectives' were not conducted, 84 times (92.3%) the teachers had reported that the objectives were 'enjoyed and participated' rather than reporting 'not conducted'. Similarly, out of 64 occasions when the teacher's script was not conducted, 63 times (98.4%) the teachers reported it as 'enjoyed and participated' rather than 'not conducted'. ▪ This clearly shows the magnitude of the 'deference effect' and consequently indicates the poor validity of subjective feedbacks in Indian school settings. **Correlates of intervention outcomes** ▪ The school-wise scores of the rigor in implementation of the classroom curriculum are plotted against the school-wise outcomes, change is the susceptibility to chew tobacco. ▪ In addition, the communication between students and peer leaders (r = 0.66, P < 0.005) and higher proportion of students participating in the classroom discussions (r = 0.70, P < 0.005) correlated with better outcomes.

about participation after recruitment, three reported being unwell and seven could not be contacted for their final review appointment. ▪ No other details related to withdrawals were reported. **Funding**: Fogarty International Center (R01TW05952-01 to C.L.P., principal investigator).		forms). Students also discovered that breathing someone else's tobacco was harmful. ▪ 'Classroom session 4' focused on the harmful social effects of tobacco use and also gave more details on passive smoking. The corresponding school poster said 'Please Stop, Your Smoke is Hurting Us'. ▪ Additionally, there were sessions that focused on social skills and susceptibility of use. These sessions also helped the students analyse various social situations where tobacco is offered, learn how to refuse it and practice applying these skills to various social situations. It also provided real-life competencies to resist tobacco and advocacy skills to speak out against tobacco use. *The classroom curriculum–delivery* ▪ The seven sessions had to be delivered on seven different days, over 4–5 months. Each classroom teacher was free to decide their own schedule for its delivery. *Posters* ▪ Eight different illustrative posters were used. Each was put up in the classroom 1 day prior to the delivery of the respective classroom session. ▪ The posters reinforced the content of each classroom session. *Parent postcards* ▪ Six illustrative parent postcards (with six different pictorial messages, specific to the learning objectives) were given to each student after the respective classroom session, to take home to share with their parents. ▪ Parents needed to sign the postcard stubs which the student then returned to the student peer leaders, who documented its return on a tracking sheet. *Training the program implementers* ▪ The training conducted through lectures, group work and role playing imparted knowledge on the evils and burden of tobacco use in India and hands on skills with the intervention materials: posters, postcards, manuals, games and worksheets (conducted in September 2004). ▪ *Peer leaders*: Proportional to the number of students in each class, four to six students, in a class of 30–45, were elected by their classmates, from each section, in each class. They were designated as student peer leaders. Half-days training for the peer leaders, before the start of the intervention, was conducted at the school itself. In addition, booster training was given to them before delivery of each classroom session. *Inter-school activities* ▪ The classroom sessions culminated with the children creating/enacting 'drama/skits' and 'model making' from each	

		school in intra-and inter-school events. Two inter-school events, one in Delhi and the other in Chennai, conducted over half a day, were organized. **Pharmacological Therapies**: NA **Duration/timing**: ▪ The entire intervention was staggered between August 2004 and February 2005. ▪ The classroom sessions were delivered between October 2004 to February 2005. **Assessment**: ▪ A range of indicator variables were identified. Various instruments (process instruments) or process measures were developed to be administered at various stages of the intervention. These were piloted and then modified and refined after the piloting. The list of indicator variables included: 1) proportion of teachers trained; 2) proportion of peer leaders trained; 3) teacher's satisfaction with the MYTRI programme and materials; 4) peer leader's satisfaction with the MYTRI programme and materials; 5) implementation of classroom sessions; 6) implementation of intra-session elements (posters, student's script, teachers script, games, worksheets, wrap-up, postcards); 7) proportion of students who attended each classroom session; 8) proportion of students who attended the inter-school event. *Assessing the outcomes of the intervention* ▪ Outcomes were assessed, through a student self-administered anonymous survey, administered to each student before and after the tobacco prevention intervention. ▪ Since many more people in India chew tobacco, spearman's correlation coefficient was used to correlate the 'school-wise scores of change in social susceptibility to chew tobacco' with the rigor in implementation. ▪ Dose given, dose received and reach were constructed from indicator variables extracted from the various process instruments. ▪ Dose given was based on objective documentation of the actual delivery of the intervention and dose received on subjective feedback. **Control**: NR	

Mishra et al. 2009 **Study design**: Interventional cohort study **Location**: India **Recruitment**: The program was conducted with due permission and support from the management, union, and employees of the selected industry. The employees of the industry were offered and invited to participate in an introductory session on the proposed tobacco cessation and oral cancer screening program. The program was inaugurated on 31st May 2007, the World No Tobacco Day, at the industrial unit. On the day prior to this, all employees took a pledge not to consume any form of tobacco on the 31st of May. **Objective**: To assess the tobacco quit rates among employees, through self report history, and validate it with rapid urine cotinine test; compare post-intervention KAP regarding tobacco consumption with the pre-intervention responses and assess the tobacco consumption pattern among contract employees and provide assistance to encourage	**Number of participants**: 104 employees in a chemical industrial unit in Ratnagiri district. **Mean Age**: NR **Gender**: NR **Ethnicity**: NR **Marital status**: NR **Socio-economic status**: NR **% current tobacco users:** 48 **% has never used tobacco**: 52 **% using smokeless tobacco**: 32 **Mean age to initiate smokeless tobacco use:** 27.5 years **Baseline comparability**: There was no difference between tobacco users and nonusers with respect to age, education, income, religion, duration of service, and the presence or absence of shift duty. **Inclusion Criteria**:	**Intervention**: n=104 **Delivered by**: Medical and Nursing staff from the industrial medical unit and doctors and medical social workers from a local referral hospital were invited to participate as trainees during every active intervention session. **Setting**: Workplace. No further details regarding **the setting were provided.** **Content**: ▪ Employees belonging to the industrial unit and who were willing to participate, were enrolled after signing the written informed consent form which was made available in English and also in the local language (Marathi). ▪ The *first session* included an introductory lecture and interviews of the employees to collect the pre-intervention data about various socio-demographic and risk factor variables. ▪ Diary cards in which the tobacco users were asked to record their daily tobacco consumption were introduced. ▪ All employees with or without tobacco habit were screened for oral neoplasia by naked eye visual inspection conducted by doctors. ▪ Visual inspection of the oral cavity is simple and acceptable with a sensitivity ranging from 57.7-64% in previous studies and a specificity ranging from 98.6 to 98.8%. ▪ All employees using tobacco in smoking forms, were offered a smoke check by a hand-held, battery-operated device to measure the concentration of carbon monoxide in their breath. This easily operable instrument, though a good educational tool as the results are color-coded, has limited sensitivity and specificity and is unable to detect the use of smokeless tobacco products. ▪ The follow-up sessions comprised of focus group discussions (FGD) among tobacco users on various issues like motivation, changing attitude, coping with withdrawals, relapse prevention, sharing of experiences etc. ▪ During follow-up the employees were assisted with different types of relaxation and coping techniques, assertiveness skills and relapse prevention techniques. They were sensitized to the hazards of tobacco consumption, monitored for tobacco usage and assisted to cope with nicotine withdrawal symptoms. ▪ Numerous activities like slogan and poem competition, debates, feedback sessions and community group activities for tobacco control were conducted by the employees. Employees, in small	**OUTCOME MEASURES** ▪ The initial interview findings indicate tobacco consumption rate of 48% (50 tobacco users), of which seven employees used smoking forms, 33 smokeless forms and 10 used a combination of smoking and smokeless forms. ▪ According to the Fagerstorm scale, 13 employees (77%) using smoking form of tobacco had a score of zero, and 29 employees (67%) using smokeless forms of tobacco had a score varying from 0 to 5. ▪ Smoke check test offered to smokers, was mainly used as an educational tool and the values of Carbon monoxide as detected by the smoke check test were 0-6 for 16 employees, greater than 10 for 1 employee. **Cessation rates and health outcoomes** . ▪ Tobacco users were offered behavioral therapy in the form of FGD and one-to-one counselling from round two onwards. ▪ Among the 50 tobacco users invited for the FGD, 90% participated in the first session, 88% in the second session, 88% in the third session, 66% in the fourth session, 90% in the fifth session, 84% in the sixth session and 86% in the seventh session. ▪ The main reason for non-participation was absenteeism on the days of intervention, which was high during fourth session due to festive season. ▪ The non-participants were contacted on phone to enquire about their stage of tobacco cessation and remind them about quitting tobacco. ▪ The number of employees quitting tobacco increased with each session of follow-up. The tobacco quit rates in the first, second, third, fourth, fifth and sixth follow-up sessions were 30%, 44%, 48%, 46%, 46% and 48% as per self report history. ▪ The quit rate at the end of the study was 40% as per the urine cotinine test results. ▪ Only five tobacco users were offered pharmacotherapy in the form of Bupropion from fifth session onwards, after careful assessment. ▪ A single employee among this group quit tobacco while two employees did not comply with the pharmacotherapy because of side effects like inability to concentrate and irritation following the use of Bupropion. ▪ There was no difference in quit rates according to the age group of employees. ▪ The quit rates among employees using smoking forms of tobacco was 14.29%, those using tobacco in smokeless forms was 51.52% and 20% amongst those using combination of smoking and smokeless forms. ▪ Forty seven per cent of the employees who quit tobacco, had attempted quitting in the past. ▪ Among the 20 employees who finally quit tobacco, 21% had attempted quitting tobacco once previously, 10% had attempted quitting twice

quitting. **Length of Follow Up**: Follow-up sessions were offered at an interval of six to eight weeks. **Randomisation**: NA **Allocation Concealment**: NA **Blinding**: NA **Intention-to-treat**: NA **Loss to follow up**: NR **Funding**: NR	All 104 employees working in the selected chemical industrial unit were eligible to participate. **Exclusion Criteria**: There were no exclusion criteria.	groups conducted community activities to reach different sections of the society with 'No Tobacco' message. In addition to the follow-up visits, regular reminders in the form of phone calls and greeting cards with quit tobacco message, were sent to the tobacco users. ▪ A lecture on different aspects of tobacco control was delivered by an expert during each visit for all employees. Follow-up oral examination was conducted for those diagnosed with lesions. Though many tobacco users are able to quit successfully with behavior therapy alone, pharmacotherapy, which focuses on alleviation of withdrawal symptoms, was expected to further increase the chance of successful quitting. [7] Nursing staff and doctors attached to the industry and from the local referral hospital were invited to participate as trainees during the active intervention sessions for local manpower development. **Pharmacological Therapies**: Pharmacotherapy in the form of Bupropion tablets, an antidepressant which helps in reducing the cessation induced depression related to nicotine withdrawal, was prescribed from fifth session onwards, based on individual need assessment. **Duration/timing**: 1 year **Assessment**: ▪ The socio-demographic characteristics and pre- and post-intervention knowledge, attitude, and practices regarding tobacco use were analyzed among tobacco users and nonusers, and the groups were compared using a nonparametric test. ▪ The distribution of the overall prevalence of smoking and smokeless forms of tobacco use was calculated. ▪ The relationship of tobacco use with oral lesions and reasons for initiation and continuation of the tobacco habit were analyzed. ▪ The data was computerized at the Tata Memorial Hospital. **Control**: No control group defined. Analysis compared tobacco users to non-users within the group of volunteers.	previously, 10% had attempted quitting thrice previously and one employee had attempted quitting seven times previously. ▪ Among the quitters, 53% had never attempted quitting in the past. ▪ They however quit tobacco after intense counselling by the tobacco control team. ▪ The tobacco quit rates among employees with presence of precancerous lesions was 25% and in employees without lesions was 30%. The oral examination findings correlate with the tobacco quit history and a remarkable reduction in the size of lesions and improvement in the oral hygiene was noted amongst employees who quit tobacco. **Participant satisfaction and process** ▪ The employees found FGDs and health awareness lectures particularly useful. ▪ On being asked for suggestions for further improvement of the program, 54% of the participants appreciated the program and felt no improvement in the program was required. ▪ Some employees suggested introduction of periodic urinary cotinine test instead of a single test at the end, while few suggested that fear about acquiring tobacco related diseases needed to be introduced during counselling. ▪ The major withdrawal symptoms faced by the tobacco quitters were uneasiness, craving, temptation and constipation. When interviewed, lack of will power, to be part of a social group emerged as reasons given by non-quitters for continuation of tobacco use. ▪ Employees who relapsed after initial quitting stated physical discomfort like constipation and peer pressure from the social group outside the industry as the reasons for relapse. ▪ Majority of the employees appreciated the program and believed that it had helped them to bridge the gap between their thoughts and behavior and motivated them to stop tobacco use. This, they felt, was the major strength of the program.
Pau et al. 2003 **Study design**: Cross-sectional survey of an intervention **Location**: UK	**Number of participants**: n=58 **Mean Age**: 42.2 **Mean age when**	**Intervention**: NR (See data extraction Croucher et al. 2003a). A cross-sectional survey was carried out in which participants were interviewed over the telephone in Sylheti researchers. A semi-structured questionnaire was used. The researchers had been in regular	**<u>OUTCOME MEASURES</u>** **Intervention effectiveness** ▪ At the time of the interview, 20 subjects (34%) reported having a tooth problem. ▪ Subjects generated 26 word descriptors of pain. Flickering was used 30 times, whereas burning was used three times.

Recruitment: Participants were recruited from Two local authority housing estates in Tower Hamlets populated by high proportions of Bangladeshi families. A total of 58 tobacco-chewing volunteers in Croucher et al.'s (2003a) study reported oral pain on giving up tobacco. They had been recruited into the intervention group of a study investigating the effectiveness of nicotine replacement patches in tobacco cessation amongst female paan-with-tobacco users. **Objective**: To explore the oral pain reported by the Bangladeshi female tobacco-chewing volunteers in Croucher and colleagues' (2003) study and to investigate its relationship with psychological distress. **Length of Follow Up**: NR **Randomisation**: NR **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: NR	**started chewing paan:** 23 **Mean number of paan chewed per day:** 10 **Gender**: females **Ethnicity**: Bangladeshi **Marital status**: NR **Socio-economic status**: NR. **Socio-economic status: Baseline comparability**: NR **Inclusion Criteria**: NR **Exclusion Criteria**: NR	communication with the sample to assess their progress during a tobacco cessation program. **Delivered by**: Two Bangladeshi female researchers. **Setting**: Two local authority housing estates in Tower Hamlets. **Content**: NR (See data extraction Croucher et al. 2003a). **Assessment**: ▪ Pain quality was elicited through an open-ended question. The subjects were asked about the quality or character of their oral pain, the site of pain—whether the pain came from a tooth or teeth or from other oro-facial structures, the duration of the pain, and whether the pain was spontaneous or provoked. They also were asked if they had a tooth problem at the time of the interview. ▪ The General Health Questionnaire (GHQ-12) was used to measure psychological distress. This questionnaire contains 12 questions on level of concentration, insomnia, perception of usefulness and competence, enjoyment of daily activities, feelings of happiness and depression, and perception of self-esteem and confidence. ▪ Each question within the GHQ-12 has four possible responses. The scoring system used in this study assigned scores of 0, 0, 1, and 1 to the responses, giving overall scores that ranged from 0 to 12. The recommended cutoff threshold for psychological distress is a score of 9 or above. ▪ The following data were collected on the sample at entry into the tobacco cessation program: age, age when started chewing paan, and number of daily paan. **Control**: NR (See data extraction Croucher et al. 2003a).	▪ The site of pain reported by half the sample was ''teeth,'' whereas the other half located their pain at sites other than their teeth. At the time of the interview, the majority of the sample reported that their pain had lasted for less than 1 week. ▪ 38 participants described the onset of pain as spontaneous. ▪ The majority of participants described the pain intensity as mild or discomforting. ▪ Significant predictors of psychological distress following tobacco cessation were the number of daily paan (odds ratio, OR~1.13), current tooth problem (OR~4.60), pounding pain (OR~6.50), pain on provocation (OR~3.21), and distressing or excruciating pain (OR~5.57).

Funding: NR			
Perry et al. 2008 **Study design**: RCT **Location**: India **Recruitment**: Schools were recruited by the investigators and involved multiple meetings in each school with the school administration and teachers. Schools were asked to sign a cooperative agreement that included the school's willingness to be randomized to either an intervention or delayed-intervention control group. The agreement was very specific about what the school would receive from the MYTRI project (teacher training, peer-leader training, all curriculum materials, posters, postcards for parents) and what was expected of them (identification of students, support of the project, class time). The cooperative agreement was unusual in the Indian context where verbal agreements are more often the procedure, and so the schools were reluctant to sign the agreement without considerable thought and	**Number of participants**: All students enrolled in the participating schools in the 6th and 8th grades in 2004 (n=12,484). **Mean Age**: NR **Gender**: 54.9% male **Ethnicity**: NR **Marital status**: NA **Socio-economic status**: 50.6% in Delhi (vs. Chennai), 38.6% in private (vs. government) schools. No additional information regarding socio-economic status was reported. **Baseline comparability**: The baseline response rate from the summer 2004 survey was 94.1% (11,748), with 45.3% of the students in the intervention condition and 52.9% were in the sixth (vs. eighth) grade. There were no differences between	**Intervention**: n=16 schools **Delivered by**: Teachers and peer leaders **Setting**: School-based **Content**: ▪ Development of the intervention strategies began by coming to agreement on the types of intervention components, based on scientific and practical considerations. ▪ It was decided to have five to seven session curricula (about 70 minutes per session) in each of the sixth, seventh, eighth, and ninth grades. ▪ The sessions include teacher-led discussions at the beginning and end, and peer-led small group activities (e.g., games, worksheets) as the main focus of each session. ▪ These curricula were based on or adapted from activities that had been implemented in prior social influence curricula, such as the Minnesota Smoking Prevention Program (Perry et al., 1992), D.A.R.E. Plus (Perry et al., 2003), and HRIDAY (Reddy et al., 2002). ▪ The curricula activities were all peer led not only because of the success of this approach but also because peer leaders were needed to manage group activities in classrooms with a large number of students. The use of peer leaders—students who were elected by their peers to serve as group leaders for the curricula—is a very novel way of conducting an educational program in India. ▪ It was also agreed to develop school posters that would complement the themes of each session of the curriculum; posters are particularly well received by teachers and schools in India as a way to extend learning. ▪ Parent homework assignments and parent postcards were selected as ways to educate parents; these approaches had been effective in prior research. Finally, peer leaders were involved in inter- and intra-school activities at the school and community levels to make changes in those environments to reinforce the messages in the classroom and home. ▪ Peer activism had been successfully implemented in prior research by HRIDAY and so was adapted for MYTRI. **Duration/timing**: ▪ At each school, 2 cohorts of students—those in the 6th and 8th grades when the study began in 2004—participated in the project.	To date, the translation process has been quite successful, with very high survey response rates, teacher ratings of the program's appropriateness, program completion rates, and student participation.

input. In total, 93 schools were contacted to be part of the study. Of those, meetings were arranged with 68 of the schools (73.1%), and 32 schools signed the cooperative agreement (47%). The reasons most often given for not wanting to participate included: not wanting to sign the cooperative agreement, lack of time and teaching staff to conduct extracurricular activities, apprehension that the activities would encroach on academic time, and the perception that tobacco use was not a current problem in their schools (especially among girls and in the younger age groups). The final research design for Project MYTRI includes 32 schools in Delhi and Chennai. The 2-year primary prevention intervention is aimed at all sixth- and eighth-grade students in the 16 intervention schools. **Objective**: To describe the process of translational research in Project Mobilising Youth for Tobacco-Related Initiatives	conditions in baseline demographics or tobacco use rates. **Inclusion Criteria**: NR **Exclusion Criteria**: NR	Students in these cohorts were surveyed 3 times. Study duration was 2 years. **Assessment**: ▪ Evaluation of the MYTRI consisted of outcome, intermediate, and process measures that were implemented prior to, during, and following a 2-year intervention period. ▪ The major outcomes, tobacco use and tobacco use susceptibility, were being measured with annual surveys of the students. ▪ The Institutional Review Board at the University of Minnesota and the Independent Ethics Committee (Mumbai, India) approved the study protocol. ▪ Informed consent procedures were followed. Parent permission was sought through letters delivered by the child (the usual procedure in India). Many parents were confused and alarmed about the consent procedure because any activity that is approved by the school administration generally does not seek additional parent and student approval in India. **Control**: n=16 schools No information regarding the control condition components was reported.	

in India (MYTRI), with particular attention to differences between the United States and Indian contexts and implications for practice. **Length of Follow Up**: 2-year. **Randomisation**: These schools were stratified by city, gender (boy-only, girl only, coed), and type (government, private) and were randomized into intervention and delayed-program control groups. Randomisation method not described. **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: NR **Funding**: Funding for this project is provided by a grant from the Fogarty International Center (R01TW05952-01).			
Perry et al. 2009 **Study design**: RCT and survey **Location**: India	**Number of participants**: All students enrolled in the participating schools in the 6th and 8th grades in 2004 (n=12,484), in	**Intervention**: n=16 schools **Delivered by**: Teachers and peer leaders **Setting**: School-based **Content**:	**<u>OUTCOME MEASURES</u>** **General Findings** In the first year, 88% of all curriculum activities were completed, and in the second year, 93% of activities were completed. All posters were routinely hung in the schools and classrooms, and, during the

Recruitment: Students from 16 schools in Delhi and 16 schools in Chennai were recruited to participate in the group-randomised trial. In 2004, 32 schools participated in the survey; in 2005 and 2006, 2 schools did not participate as a result of conflicting academic schedules and priorities. An additional 3 schools would not allow 10th graders to participate in 2006 because of upcoming national exams. Reasons for non-participation included parent refusals (which occurred in less than 1% of cases), student refusals (also less than 1%), and student absentees or school lack of participation (range=4%–16%). Makeup surveys were conducted to accommodate students who were absent on the day of the survey. The 2 schools that did not participate in the survey were in Delhi; one was an intervention school and one was a control school. The 3 schools that did not allow 10th graders to participate in 2006 were also in Delhi; 2 were control	the 7th and 9th grades in 2005 (n=12,075), and in the 8th and 10th grades in 2006 (n=12,752) were eligible and invited to participate in the survey. 14,063 students completed 1 or more of the study surveys; 6,365 (45.3%) students completed 3 surveys, 3,780 (26.9%) completed 2 surveys, and 3,918 (27.9%) completed 1 survey. **Mean Age**: NR **Gender**: 43% female **Ethnicity**: NR **Marital status**: NA **Socio-economic status**: 62.1% were enrolled in government (lower socioeconomic status) schools, 46.5% were from Delhi. No additional information regarding socio-economic status was reported. **Baseline comparability**: Baseline levels of chewing tobacco use	▪ The Mobilizing Youth for Tobacco Initiatives in India (MYTRI) intervention was developed with social cognitive theory and existing evidence-based smoking prevention programs as a frame of reference. ▪ The objectives of the intervention were to influence environmental factors (social norms, role models, social support, opportunities) and intrapersonal factors (knowledge, values, meanings, beliefs, skills) that predict tobacco use among urban Indian youths. ▪ Three types of tobacco use—cigarette smoking, bidi smoking, and use of chewing tobacco—were addressed. ▪ The 2-year school-based intervention consisted of 4 primary components. First, the behavioral component consisted of 7 peer-led classroom activities for 6th- and 8th-grade students in 2004–2005 and 6 additional activities for 7th- and 9th-grade students in 2005–2006. ▪ Second, 6 posters were hung in schools each year, corresponding with classroom activity themes. In the third, parental involvement component, 6 postcards were sent home to parents during the 2004–2005 school year. ▪ Finally, the peer leadership component focused on peer-led health activism outside of the classroom, including competitions between classrooms and schools. ▪ The components were designed to be generally relevant to the schools' settings, developmental stages, and educational approaches. However, unique strategies were implemented as well, notably the use of an activity format in which elected peer leaders facilitated small groups. ▪ Implementation of the intervention included the training of field staff, teachers, and peer leaders in each city at the beginning of both school years. There was also ongoing support in the schools as needed by field staff. ▪ The intervention spanned approximately 4 months of each school year. Sets of manuals for teachers and peer leaders were provided, as well as activity classroom supplies and a handbook for each student. ▪ Materials were developed in English, Hindi, and Tamil as appropriate to each school's need. **Duration/timing**: ▪ At each school, 2 cohorts of students—those in the 6th and 8th grades when the study began in 2004—participated in the project. Students in these cohorts were surveyed 3 times. Study duration was 2 years. **Assessment**:	first year, at least 76% of postcards were delivered to parents. In the first and second years, 678 and 761 students, respectively, were trained to be peer leaders and 153 and 133 teachers, respectively, were trained to supervise and assist peer leaders and to structure the classroom activities. The peer leaders organized an interschool activity in each of the cities, with 3,569 students attending in the first year (67% of the intervention cohort) and 4,652 students attending in the second year (81%). **Tobacco Use Outcomes** ▪ There were significant between-group differences in the trajectories of cigarette smoking (P<.05), bidi smoking (P<.01), and any tobacco use (P<.04) over the 2 years of the intervention. ▪ Rates of cigarette smoking and bidi smoking, as well as any tobacco use, increased over time in the control group (as would be expected with this age population), the rate of tobacco use in the intervention group actually decreased over time. ▪ There were no significant between-group differences in the trajectories of chewing tobacco use (P>.10). ▪ Tobacco use increased by 68% in the control group and decreased by 17% in the intervention group over the 2 years. **Intentions and Psychosocial Factors** ▪ At baseline, there were no differences between groups in intentions to use tobacco or on any of the scales assessing psychosocial factors associated with tobacco use. ▪ There were significant differences in the trajectories (rates of growth) of students' intentions to chew tobacco (P<.03) and to smoke (P<.01) over time, with the intervention students decreasing their intentions more so than the control group. ▪ Intentions to smoke increased by 5% in the control group and decreased by 11% in the intervention group. Intentions to chew tobacco decreased by 12% in the control group and by 28% in the intervention group. ▪ There were also significant differences in students' social, environmental, and intra-personal factor trajectories over time. ▪ There were between-group differences with respect to knowledge of the health effects of tobacco use, reasons to use and not use tobacco, perceived prevalence of chewing tobacco use, perceived prevalence of smoking, normative beliefs regarding tobacco use, advocacy skills self-efficacy, knowledge of tobacco-control policies, and social susceptibility to chewing tobacco use (all: P<.05). **Gender and Grade-Level Effects**

schools and one was an intervention school. **Objective**: To assess the effectiveness of a 2-year multi-component, school-based intervention designed to reduce tobacco use rates among adolescents in an urban area of India. **Length of Follow Up**: 1-year. **Randomisation**: As a means of ensuring representativeness, schools within each city were matched according to type of school (private vs. government, and co-educational vs. girls only vs. boys only) and then randomly assigned to receive the tobacco use intervention program over 2 academic years or to serve as a delayed intervention control school. Randomisation method not described. **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: There was a lack of data from 2 of the Delhi schools (1 intervention school and 1	and cigarette smoking were equivalent among intervention-and control-group students. **Inclusion Criteria**: NR **Exclusion Criteria**: NR	▪ The primary evaluation consisted of a self-administered scannable survey implemented in classrooms by 2-person teams of trained research staff utilizing standardized protocols. ▪ Students completed the survey before the beginning of the intervention (2004), at the midpoint of the intervention (2005), and after completion of the intervention (2006). ▪ The confidentiality of student responses was ensured through the use of a unique identification tag that was not recognizable to students or school staff but could be used to track students over time. ▪ The survey, which was administered in English, Hindi, or Tamil, was adapted from existing instruments and underwent rigorous pilot testing as well as reliability and validity testing. ▪ The survey assessed current tobacco use. ▪ Two composite scores were developed to assess future intentions (in the subsequent year, in college, or as an adult) to chew or smoke tobacco. ▪ 14 social, environmental, and intra-personal factors were also assessed and associated with tobacco use, including knowledge of the health effects of tobacco use, beliefs about the social consequences of tobacco use, reasons to use or not to use tobacco, perceived prevalence of tobacco use, and knowledge and support of tobacco-control policies. ▪ The analyses used a 3-level random coefficients model. ▪ Mean trajectories (i.e., changes in use or risk over time) for each student were modeled at level 1, mean trajectories for each school were modeled at level 2, and mean trajectories for each study group were modeled at level 3 (with appropriate variability modeled at each level). **Control**: n=16 schools No information regarding the control condition components was reported.	▪ Gender and grade-level interaction terms proved to be statistically significant in the case of all variables (P<.01). ▪ The trajectories for girls in the intervention schools increased less than did the trajectories for girls in the control schools with respect to bidi smoking (P<.03), cigarette smoking (P<.01), and any tobacco use (P<.01); the difference was marginal for chewing tobacco use (P<.06). ▪ The trajectories for boys in the intervention schools also increased less than did the trajectories for boys in the control schools, but differences were significant only in the case of smoking (P<.01). ▪ The trajectories for intervention group students who were 6th graders in 2004 (6th-grade cohort) increased less than did the trajectories for the control group 6th-grade cohort with respect to bidi smoking (P<.01), cigarette smoking (P<.04), and any tobacco use (P<.02). ▪ The trajectories for the intervention group 8th-grade cohort increased less than did those for the control group 8th-grade cohort, but differences were significant only for bidi smoking (P<.04). ▪ There were no significant interaction terms for type of school or city.

control school), which was a result of time constraints at these schools. Three additional schools in Delhi (2 control schools and 1 intervention school) would not allow their 10th-grade students to be surveyed because of ensuing exams (despite the previous agreement of school officials to take part in the study). **Funding**: This research was funded by the Fogarty International Center, National Institutes of Health (grant R01 TW005952-06).			
Stigler et al. 2006 **Study design**: RCT and survey **Location**: India **Recruitment**: Students from 16 schools in Delhi and 16 schools in Chennai were recruited to participate in the group-randomised trial. **Objective**: To explore possible explanations for why students in the 6th grade might be using tobacco at higher rates. **Length of Follow Up**: 1-year.	**Number of participants**: All students enrolled in the 6th and 8th grade in the 32 schools were eligible for this study and invited to participate (n = 12484). These students were surveyed again in 2005 and 2006, when they were in 7th/9th and 8th/10th grades, respectively. The response rate for the baseline survey was 94.1% (n = 11748). Non-participants	**Intervention**: n=16 schools **Delivered by**: Teachers and peer leaders **Setting**: Schools **Content**: ▪ The intervention consists of teacher- and peer-led classroom curricula; parent education through parent postcards; school posters that coordinate with the curricula; and peer-led health activism. ▪ The intervention was implemented with two cohorts of students over two consecutive school years (2004–05 and 2005–06), and subsequently evaluated using three repeated surveys of the cohorts (in 2004, 2005, and 2006) (See data extractions Stigler et al., 2007; 2011 for additional details). **Duration/timing**: ▪ At each school, 2 cohorts of students—those in the 6th and 8th grades when the study began in 2004—participated in the project. Students in these cohorts were surveyed 3 times. Study duration was 2 years.	**<u>OUTCOME MEASURES</u>** **General Findings** Almost all of the psychosocial factors evaluated here were significantly related to current use of tobacco, for students in both grades. **Tobacco Use and Psychosocial Factors** ▪ Among 6th grade students, all of the psychosocial factors were inversely associated with increased use of tobacco except for reasons students may have not to use tobacco (‘‘I do not want to use tobacco because my friends do not use it’’) and awareness about public policies related to tobacco control (‘‘Does your state have a law that bans the sale of tobacco to minors?’’) (p>0.05). The same two factors were also not associated with increased tobacco use in 8th grade (p>0.05). ▪ In addition, refusal skills self-efficacy (‘‘Could you say ‘no’ if a close friend gave you tobacco?’’) was not significantly related to tobacco use in the older cohort, nor was, notably, exposure to tobacco advertising (‘‘Have you seen any advertisements for tobacco in movies?’’”..in magazines?”) (p >0.05) ▪ Among 8th grade students, five factors were most strongly related to increased use of tobacco. In order of decreasing strength, these factors included social susceptibility to chewing tobacco (‘‘If someone at a party gave you tobacco, would you chew it?’’), social susceptibility to smoking bidis or cigarettes (‘‘If someone at a party gave you tobacco, would you

Randomisation: 32 schools were randomly assigned to receive a tobacco prevention programme or serve as a delayed programme control. Randomisation method not described. **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: NR **Funding**: The research reported was funded by a grant from the Fogarty International Center (R01TW05952-01; Perry CL, PI).	included parent refusals (<1%), student refusals (<1%), and student absentees (>4%). The final sample of analysis for this study was 11642 students. **Mean Age**: The mean age of the 6th and 8th graders was 11.2 and 12.9 years, respectively (range 10–16 years). **Gender**: 54.9% male **Ethnicity**: NR **Marital status**: NA **Socio-economic status**: 50.6% resided in Delhi (v Chennai), 61.4% attended a government school (vs. a private school), 52.9% were enrolled in 6th grade (vs. 8th). No additional information regarding socio-economic status was reported. **Baseline comparability**: NR **Inclusion Criteria**: NR	**Assessment**: ▪ A self-administered pencil and paper survey was implemented in all classrooms in these schools by two-person teams of trained staff using standardised protocols. ▪ Surveys were administered in English, Hindi, and Tamil, based on the medium of instruction in schools. ▪ All private schools in Delhi and Chennai received an English survey, while the government schools received a Hindi version in Delhi and a Tamil version in Chennai. ▪ The survey was adapted from other instruments used in prior research, including the Global Youth Tobacco Survey (GYTS) and a survey specific to Indian youth. ▪ Students completed the survey before the beginning of the intervention (2004), at the midpoint of the intervention (2005), and after completion of the intervention (2006). ▪ Tobacco use was assessed using three items to measure current use of tobacco. ▪ The response categories for all of the items were ‘‘Yes’’ or ‘‘No’’. ▪ Using the responses to the three items, a composite variable was created to measure current use of any tobacco. ▪ Students who responded ‘‘Yes’’ to one or more of the questions were given a ‘‘1’’ on this variable (for ‘‘use’’), while all other students received a ‘‘0’’ (‘‘no use’’). ▪ Psychosocial risk factors were assessed using multiple item summative scales. ▪ These included measures of intra-personal factors (knowledge about health effects of tobacco use, beliefs about social effects, reasons to use tobacco, reasons not to use tobacco, self-efficacy (refusal skills), social susceptibility (chewing), social susceptibility (smoking) and social-environmental factors (social normative beliefs), perceived prevalence (chewing), perceived prevalence (smoking), normative expectations of use, knowledge about public policies, support for public policies, self-efficacy (advocacy skills), exposure to advertising). ▪ Mixed-effects regression models were used to examine the relationship between all psychosocial risk factors and current use of any tobacco. **Control**: n=16 schools No information regarding the control condition components was reported.	smoke it?’’), support for policies for tobacco control (‘‘Should smoking be permitted in public places?’’), normative expectations of tobacco use (‘‘If you were to use tobacco, would your close friends like it?’’), and, finally, perceived prevalence of chewing tobacco (‘‘How many boys your age in India do you think chew tobacco?’’) ($p<0.01$). ▪ In all, these five factors accounted for 14.9% of the variability between students and 48.5% of variability between schools in current use of tobacco for 8th grade. ▪ A similar set of factors were most strongly associated with increased tobacco use in 6th grade, too. The factors included, in order of decreasing strength, social susceptibility to smoking, social susceptibility to chewing tobacco, support for tobacco control policy, perceived prevalence of chewing, perceived prevalence of smoking (‘‘How many boys your age in India do you think smoke tobacco?’’), and advocacy skills efficacy (‘‘Do you think you could help a friend stop smoking?’’) ($p<0.01$). ▪ Notably, exposure to tobacco advertising was strongly associated with increased tobacco use among the 6th graders as well ($p<0.01$)—though, as noted above, it was not at all for 8th graders ($p>0.05$). ▪ In all, these seven factors accounted for 31.2% of variability between students and 65.4% of variability between schools in current use of tobacco, among students in the 6th grade. ▪ There were significant differences between 6th and 8th grade in the distribution of all 15 psychosocial risk factors ($p<0.01$). Students in the 6th grade scored lower on all of the factors (thereby indicating they were at increased risk as compared to the 8th graders), except for three—perceived prevalence of chewing, perceived prevalence of smoking, and exposure to tobacco advertising. ▪ Students in the 8th grade reported more exposure to tobacco advertising and higher perceived prevalence of tobacco use among youth and adults. ▪ The magnitude of difference in ‘‘risk’’ between the grades was largest for (in decreasing strength) knowledge about the health consequences of use (‘‘Are all types of tobacco use dangerous?’’), beliefs about the social consequences of use (‘‘If you used tobacco, would your parents get angry?’’), advocacy skills self-efficacy, normative expectations about tobacco use, normative beliefs about tobacco use (‘‘Is it OK for people your age to try tobacco out of curiosity?’’), support for tobacco control policies, social susceptibility to chewing tobacco, and, last, social susceptibility to smoking tobacco. ▪ The differential between the grades was the smallest for reasons to use tobacco (‘‘Does using tobacco make a person appear to be more grown up’’), the perceived prevalence of chewing and smoking, and exposure to tobacco advertising.

	Exclusion Criteria: NR		
Stigler et al., 2007 **Study design**: RCT and survey **Location**: India **Recruitment**: Participating schools were selected based on their representativeness of the range of schools in Delhi and Chennai in terms of socioeconomic level, school type and gender. **Objective**: To investigate whether Project MYTRI altered the psychosocial risk factors as intended, and whether the changes in psychosocial risk factors were, in turn, responsible for altering students' tobacco-use intentions. **Length of Follow Up**: 1-year. **Randomisation**: Thirty-two schools were randomized to receive the intervention (n=16 schools) or serve as a delayed program control (n=16 schools). Method not described **Allocation Concealment**: NR **Blinding**: NR	**Number of participants**: 8,369 6th and 8th graders **Mean Age**: The average age of students in 2004 was 11.0 years for 6th graders and 12.8 years for 8th graders. **Gender**: 51.6% male; 48.4% female **Ethnicity**: NR **Marital status**: NA **Socio-economic status**: 56.4% of the students attended Government schools. Students from Government schools were generally from low-to-middle SES backgrounds, while Private school students generally came from middle-to-high SES backgrounds. In the survey sample, 43.5% lived in Delhi (in northern India), and 56.5% lived in Chennai (in southern India). **Baseline**	**Intervention**: n=4,009 in 16 schools **Delivered by**: Teachers and peer leaders **Setting**: School-based **Content**: ▪ The Mobilizing Youth for Tobacco –Related Initiatives in India (MYTRI) is a 2-year, school-based, multiple component tobacco intervention. ▪ The program was based on Social Cognitive Theory and other theories of youth health promotion. ▪ At its core, it is a comprehensive social influences program, with a focus on normative education and skill building, along with knowledge components. ▪ MYTRI addresses multiple forms of tobacco use relevant in this setting (chewing tobacco, cigarette, and bidi). ▪ In Year 1, intervention strategies included the following: (a) 7 classroom activities (curriculum); (b) 6 school posters; (c) 6 parent postcards; and (d) peer-led health activism. ▪ Classroom activities were conducted in small groups of 10 to 15 and were led by students or peer leaders (students admired by their classmates, elected as so). ▪ This approach has been successful in the United States but is novel to India, where didactic instruction by teachers alone is the norm. ▪ These activities were designed to be interactive and enjoyable (e.g., games). All of the posters and postcards were designed to complement the classroom activities. Posters were hung in classrooms and around the school during an activity, and postcards were hand delivered to parents by the students after an activity. ▪ As an extension of the classroom activities, competitions were also held within and between schools (i.e., intra-school and inter-school activities) and included model building (crafting a three-dimensional model a tobacco-free school) and street play (an extended, culturally appropriate role play to practice refusal skills) competition for the 6th and 8th graders, respectively. ▪ The intervention was the same for both grades, except for these competitions and their related classroom activity. ▪ All strategies targeted psychosocial risk factors related to tobacco use among these youth. School posters and postcards for parents, were designed to increase knowledge about the negative health effects of tobacco.	**OUTCOME MEASURES** **Implementation** Program activities were implemented in intervention schools with good fidelity and high participation rates. In Year 1, 13 of 16 schools completed all seven classroom activities (1 school completed 4, whereas 2 schools completed 2), for both grade levels. School posters and parent postcards, designed to complement these activities, were distributed to all intervention schools and students, respectively. Posters were hung in classrooms routinely during the activities, whereas 74% of postcards were delivered home by students to their parents. In the first year, 781 6th and 8th graders were trained as peer leaders and 161 of their teachers were trained to supervise and assist them. At the end of the classroom activities, the large interschool event in each city drew more than 3,500 people, representing 67% of the cohort of 6th and 8th graders. Observations were conducted at least once in each classroom to determine the fidelity with which classroom activities were implemented and 73% of them were delivered as prescribed. **Psychosocial Risk Factors.** At baseline, there was only one marginally significant difference between the two study conditions in these variables; students in the intervention condition had more reasons to use tobacco than the controls (P = 0.06). After 1 year of program implementation, students in the intervention condition made significant gains in 12 of the 14 psychosocial risk factors targeted by the program. Compared with students in the control, students in the intervention condition (a) had better knowledge about the health effects of tobacco (P < 0.01); (b) believed that there were more negative social consequences to using tobacco (P = 0.04); (c) had fewer reasons to use tobacco (P < 0.01); (d) had more reasons not to use tobacco (P = 0.03); (e) were less socially susceptible to chewing (P = 0.04) and smoking (P = 0.03) tobacco; (f) perceived fewer peers and adults around them smoked (P < 0.01) or chewed (P < 0.01) tobacco; (g) felt that tobacco use was not acceptable, especially among their peers (P < 0.01); (h) were more confident in their ability to advocate for tobacco control (P = 0.03); (i) were more knowledgeable about tobacco control policies (P < 0.01); and (j) supported

Intention-to-treat: NR **Loss to follow up**: ▪ There was a 31.5% attrition rate for students in the control condition and a 24% attrition rate for students in the intervention group. No other details related to withdrawals or attrition were reported. **Funding**: Funding for this study was provided by a grant from the Fogarty International Center at the National Institutes of Health (7R01TW005952-06, Cheryl Perry, PI).	**comparability**: NR **Inclusion Criteria**: NR **Exclusion Criteria**: NR	▪ Interactive classroom activities were designed to help students learn how to resist offers of tobacco from friends and family and practice being an effective advocate against tobacco use in their homes, schools, and communities. ▪ The different components of the intervention were designed in a synergistic way, to complement and supplement each other, to maximize the program's ability to change key risk factors. ▪ Implementation of the intervention began with trainings for staff, teachers, and peer leaders at the start of the school year. ▪ Teachers and peer leaders received continued support throughout the school year from the staff. ▪ A set of manuals for teachers and peer leaders was supplied, as were game boards, game cards, and handbooks for the students. ▪ Materials were supplied in multiple languages (English, Hindi, and Tamil), given each school's needs. **Duration/timing**: ▪ In Year 1, the intervention spanned 4 months and involved 15 h of activity. The first-year curriculum included seven, 70-minute classroom sessions (See data extraction Stigler et al., 2006 for additional details). **Assessment**: ▪ A self-administered pencil and article survey was implemented in classrooms in the schools by two-person teams of trained research staff using standardized protocols, before the 1st year of intervention started (2004) and after it ended (2005). ▪ Surveys were given in English, Hindi, and Tamil, based on the medium of instruction in schools. The survey is adapted from other instruments, like the Global Youth Tobacco Survey (GYTS), and underwent rigorous piloting before its administration. ▪ Multi-item, summative scales were created to measure 14 psychosocial risk factors that are related to tobacco use among youth in India and were targets of the tobacco prevention program. ▪ These psychosocial risk factors informed the design of the intervention model, as they became the objectives of the intervention. In designing the intervention components, or activities, investigators sought to change these factors to, in turn, reduce/prevent tobacco use. ▪ The risk factors included knowledge, attitudes, skills, and social norms. ▪ *Tobacco Use and Intentions.* Ten dichotomous variables were used to measure tobacco use and intentions. A higher score on the variables represents greater intentions to use tobacco/more tobacco use.	these policies, too (P = 0.04). No significant differences between study conditions in changes in refusal skill self-efficacy (P = 0.66) or normative expectations were observed (P = 0.25). **Tobacco Use and Intentions.** At baseline, there were no differences between study conditions in tobacco use or intentions to use tobacco in the future. After only 1 year of implementation, students in the intervention condition had fewer intentions to smoke tobacco in the next year (P = 0.02) and chew tobacco as they reached college age (P < 0.01). Marginally significant differences were noted in their intentions to smoke in college (P = 0.08) or as an adult (P = 0.08), as well as the intentions to chew tobacco as an adult (P = 0.07). No significant differences in actual tobacco use were observed. The prevalence of tobacco use decreased in both conditions over time.

		▪ *Intentions to Use Tobacco*. Six questions on the survey measure intentions to chew or smoke tobacco in the future. ▪ Response options were arranged on a four-point Likert scale (''surely yes,'' ''maybe yes,'' ''maybe no,'' and ''surely no''), which was dichotomized for analyses as a ''0'' (surely/maybe no) and ''1'' (surely/maybe yes). ▪ *Tobacco Use*. Three questions on the survey measure current tobacco use. ▪ The response categories were ''no'' or ''yes.'' Students who responded ''yes'' to one or more of these three questions were combined to measure current use of ''any tobacco.'' ▪ Mixed-effects regression models were used to examine differences in the primary and secondary outcomes between the study conditions over time. **Control**: n=4,360 in 16 schools No information regarding the control condition components was reported.	
Stigler et al. 2011 **Study design**: RCT and Survey **Location**: India **Recruitment**: Students from 16 schools in Delhi and 16 schools in Chennai were recruited to participate in the group-randomised trial. **Objective**: To present the results of a mediation analysis of Project MYTRI. Specifically, it examines how the program achieved its effects in regards to reducing students' tobacco use intentions and tobacco use behaviors. **Length of Follow Up**: 1-year.	**Number of participants**: This study focuses on the 14,085 students who completed one or more of the three surveys: 6,365 (45.3%) completed three surveys, 3,780 (26.9%) completed two surveys, and 3,918 (27.9%) completed one survey. Non-participants included parent refusals (<1%), student refusals (<1%), and student absentees (>4%). Make-up surveys were conducted at	**Intervention**: n=16 schools **Delivered by**: Teachers and peer leaders **Setting**: School-based **Content**: ▪ The Mobilizing Youth for Tobacco –Related Initiatives in India (MYTRI) is a 2 year, school-based, multiple-component tobacco prevention program. ▪ The overall goal of the program was to reduce tobacco use among students in Grades 6 to 9, including cigarette smoking, bidi smoking, and chewing tobacco (e.g., *gutkha*), which are common in this setting. ▪ The objectives of the program were to change multiple intrapersonal factors (e.g., knowledge, meanings, skills) and social-environmental factors (e.g., social norms) known to be related to tobacco use among urban Indian youth. ▪ Intervention strategies included classroom activities, school posters, parent postcards, and peer-led health activism. ▪ The intervention model is based on the social influences model and Social Cognitive Theory, as well as other evidence-based smoking prevention programs "translated" for use in this setting. ▪ Extensive formative development, including multiple focus group discussions were an important part of this translation process. ▪ Materials were developed and implemented in English, Hindi,	**<u>OUTCOME MEASURES</u>** **General Findings** The analysis identified variables that had a positive effect on the program's outcomes (consistent mediators) and variables that had a negative effect (inconsistent mediators). Some variables (non-significant mediators) had neither a positive or negative effect **Consistent Mediators** ▪ The intervention had a consistent, positive effect on 5 of the 12 hypothesized mediators for both the behavior and the intention models: knowledge of health effects, reasons to use, reasons not to use, advocacy skills efficacy, and normative beliefs (α). ▪ All of these change processes, in turn, had a negative effect on the behavior and the intention outcomes (β). ▪ The product of these effects, or the indirect effect (αβ), was significant for all, which is indicative of mediation. One additional process, beliefs about social consequences, was also a consistent mediator for intentions to use tobacco. ▪ When these statistically significant mediators were added to multiple-mediator models, only reasons to use tobacco and normative beliefs remained statistically significant for tobacco use behaviors, accounting for 41% and 22% of the intervention's total effect, respectively. In the multiple mediator models for tobacco use intentions, only normative beliefs remained statistically significant, accounting for 95% of the total intervention effect.

Randomisation: 32 schools were randomly assigned to receive a tobacco prevention programme or serve as a delayed programme control. Randomisation method not described. **Allocation Concealment**: NR **Blinding**: NR **Intention-to-treat**: NR **Loss to follow up**: NR **Funding**: Fogarty International Center grant R01TWO5952-01.	schools to reduce the number of absentees. In 2005 and 2006, two schools (one intervention, one control) could not participate because of conflicting schedules. In 2006, three additional schools (two controls, one intervention) would not let 10th-graders participate because of pending national-level exams. The final sample of analysis for this study was 11,642 students. **Mean Age**: The mean age of the 6th and 8th graders was 11.2 and 12.9 years, respectively (range 10–16 years). **Gender**: 43.4% female **Ethnicity**: NR **Marital status**: NA **Socio-economic status**: 50.6% resided in Delhi (v Chennai), 61.4% attended a	and/or Tamil, according to each school's requirements. (See data extractions for Stigler et al., 2006; 2007 for further details). **Duration/timing**: ▪ At each school, 2 cohorts of students—those in the 6th and 8th grades when the study began in 2004—participated in the project. Students in these cohorts were surveyed 3 times. Study duration was 2 years. **Assessment**:. ▪ A self-administered pencil and paper survey was implemented in all classrooms in these schools by two-person teams of trained staff using standardised protocols. ▪ Surveys were administered in English, ▪ Hindi, and Tamil, based on the medium of instruction in schools. All private schools in Delhi and Chennai received an English survey, while the government schools received a Hindi version in Delhi and a Tamil version in Chennai. ▪ The survey was adapted from other instruments used in prior research, including the Global Youth Tobacco Survey (GYTS) and a survey specific to Indian youth. ▪ Tobacco use was assessed using three items to measure current use of tobacco. ▪ The response categories for all of the items were ''Yes'' or ''No''. ▪ Using the responses to the three items, a composite variable was created to measure current use of any tobacco. ▪ Students who responded ''Yes'' to one or more of the questions were given a ''1'' on this variable (for ''use''), while all other students received a ''0'' (''no use''). ▪ Psychosocial risk factors were assessed using multiple item summative scales. ▪ These included measures of intra-personal factors (knowledge about health effects of tobacco use, beliefs about social effects, reasons to use tobacco, reasons not to use tobacco, self-efficacy (refusal skills), social susceptibility (chewing), social susceptibility (smoking)) and social-environmental factors (social normative beliefs, perceived prevalence (chewing), perceived prevalence (smoking), normative expectations of use, knowledge about public policies, support for public policies, self-efficacy (advocacy skills), exposure to advertising). ▪ Two groups of variables were considered as potential outcomes for this mediation analysis: (a) tobacco use behaviors and (b) tobacco use intentions. ▪ Changes in tobacco use behaviors were observed after Year 2 of the program, for past 30-day (i.e., past month) cigarette smoking	**Inconsistent Mediators** ▪ Two variables were identified as inconsistent mediators in the single-mediator models: perceived prevalence of chewing and perceived prevalence of smoking indicating that the intervention had a significant, but negative, effect on these mediators that, in turn, increased both tobacco use intentions and behaviors. ▪ Inconsistent mediation occurred when the direct effect on the potential mediator (α) and its corresponding mediated effect (αβ) have opposite signs (i.e., one is negative and the other is positive. **Non-significant Mediators** ▪ The estimate of the mediated effect (αβ) was not significant for some variables. ▪ For tobacco use behaviors, these included beliefs about social consequences, refusal skills self-efficacy, support for tobacco control policy, knowledge of tobacco control policy, and normative expectations. ▪ For tobacco use intentions, all of the same variables were non-significant mediators as well, except beliefs about social consequences.

	government school (vs. a private school), 52.9% were enrolled in 6th grade (vs. 8th). No additional information regarding socio-economic status was reported. **Baseline comparability**: NR **Inclusion Criteria**: NR **Exclusion Criteria**: NR	and bidi smoking only. ▪ A single variable, therefore, was constructed to represent these two behaviors, combined in the mediation analysis as a single outcome. ▪ Changes in tobacco use intentions were observed after Year 1 and Year 2 of the intervention, for intentions to smoke or chew tobacco. ▪ A single variable, therefore, was constructed to represent these two types of intentions, combined in the mediation analysis as a single outcome ▪ Mixed-effects regression models were used to examine the relationship between all psychosocial risk factors and current use of any tobacco. **Control**: n=16 schools No information regarding the control condition components was reported.	

Question 2: Contextual

Study details	Population and setting	Methods	Findings	Notes
Author: Ahmed et al **Year**: 1997 **Setting / country**: Tower Hamlets, London, UK **Aim of study**: To investigate the prevalence of betel quid chewing, smoking, and knowledge of health hazards associated with these habits **Study design**: Cross-sectional questionnaire **Funding**: Steels Lane Health Centre **Quality**: +	**Number of participants**: Response from140 Questionnaire sent to 340 people. **Mean Age**: NR Age <45 yr n=92 Age >45 yr n=48 **Gender**: 75 Women (48%) 65 Men (43%) **Other**: No statistically significant differences in the age and sex distribution of respondents and non respondents.	**Data collection methods**: Bangladeshi patients aged 25 years and over registered at Jubilee Street Practice in Tower Hamlets. Bangladeshi adults were identified by searching the practice computer database for 85 Bangladeshi surnames. The practice routinely records self-reported ethnic origin at the new patient registration check, and this was used to validate the name search method. A culturally verified and piloted bilingual postal questionnaire was used. **Data Analysis**: statistical analysis in Excel spreadsheet. **Attrition**: 46% of the study population replied to the questionnaire	**Main Themes relevant to research question**: The **prevalence** of betel quid chewing was over 80% with no sex difference. Men were more likely to smoke tobacco than women (men = 57%, women = 11%, $\chi 2 = 33.3$, $P < 0.001$). **Tobacco was added to pan** in 29% of men and 43% of women (p.0.09) **Place where subjects started chewing betel quid** 25% of both sexes started chewing pan in London, the others in Bangladesh. Those who started in London were younger (average age 34 years) than those who started in Bangladesh (average age 44 years). **Knowledge of adverse health effects of betel quid** Knowledge of the effects of chewing betel quid was significantly less widespread than **knowledge of smoking risks**. 24% of men and 36% of women linked betel quid and mouth **cancer** ($\chi 2 = 82.4$, df = 1, $P < 0.001$). 48% of men and 59% of women agreed that pan chewing could cause **dental problems**. 24% of men and 36% of women agreed that pan chewing could be linked to **mouth cancer**.	

Study details	Population and setting	Methods	Findings	Notes
Author: Bedi and Gilthorpe **Year**: 1995 **Setting / country**: Birmingham, UK **Aim of study**: to examine the prevalence of betel-quid chewing and perceptions of risk **Study design**: Cross-sectional Questionnaire interview **Funding**: Department of health **Quality**: +	**Number of participants**: 126 households; 336 adults **Mean Age**: NR **Gender**: Mixed gender **Other**: NR	**Data collection methods**: Sampling within the electoral ward of Aston (largest Bangladeshi population). Identification by social workers by selecting Bangladeshi names from the electoral register. 699 households were identified. 127 households were contacted. Interviews took place in the home by trained Bangladeshi interviewer. A culturally verified and piloted bilingual in-person questionnaire was used **Data Analysis**: chi-squared to explore associations. **Attrition**: One household refused. Response rate 71% from household interviews.	**Main Themes relevant to research question**: 92% males and 96% females chew betel quid on a **daily basis**, and the commencement of habit is greatest in teens. Main reason **taking up chewing** was that 'everyone else normally chewed' (equally report among genders). More males than females indicated they '**liked the taste'** ($p<0.001$) Of those who have chewed at some point, only 8 (9%) of males, and 4(4%) females have successfully **given up** without any clear reason why. The head of household (males) was the predominant **purchasers** of betel-quid used by the family ($P<0.001$). Females rarely purchased own quids. More women (81%) than men (37%) **add tobacco** to their quid ($p<0.001$). Smoking was more common among men, and was more **socially acceptable**. There is a broad acceptability for smoking and chewing for men, with over 1/3 accepting these habits. Females generally condone their chewing habits more than men seem to. It is frowned upon for women to smoke, but acceptable to chew, even with tobacco. There is general disapproval for **children** to chew betel-quid.	

Study details	Population and setting	Methods	Findings	Notes
Author: Croucher & Choudhury **Year**: 2007 **Setting / country**: Tower Hamlets, London, UK **Aim of study**: To reflect on recent proposed tobacco control initiatives in the socio cultural context of the smoking behaviours of UK resident Bangladeshi men. **Study design**: Qualitative study using focus groups and one-to-one interviews **Funding**: Department of Health **Quality**: +	**Number of participants**: 81 Bangladeshi men **Age**: Range 18-64 19 (24%) 50-64 years 21 (26%) 30-49 years 41 (50%) 18-29 years **Gender**: 100% Men **Other**: 58(72%) reported that they were born outside the UK. 47(58%) were not in paid employment, either retired, unemployed, students or working as volunteers, with the remaining 42% being restaurant workers or community workers.	**Data collection methods**: 81 Bangladeshi men were recruited from social, community and voluntary groups and workplaces, and took part in 12 focus groups and three interviews. Purposively selected to reflect their age, place of birth and tobacco-use status. Referrals by recruited participants (snowball sampling) were also used to identify possible additional participants. The database of an existing tobacco cessation service for the Bangladeshi community was also scrutinised to identify potential participants who had experience of stop smoking attempts. Male facilitator that respected language preference in focus groups **Data Analysis**: Transcripts were analysed using 'framework' principles. This identifies themes and organises the transcribed data through the development of a matrix. Interview and focus group data were treated as equivalent and analysed together. **Attrition**:	**Main Themes relevant to research question**: Appropriate **female tobacco use behaviour** was the traditional practice of chewing tobacco in paan (chewing tobacco mixed with areca nut rolled in a betel leaf). Despite the observations reported above about the gendered use of chewing tobacco in paan, younger participants were more likely to report the use of this legally available alternative as a **substitute for cigarettes**. These respondents appeared to be sufficiently well informed to realise that smoking cigarettes was only one method of accessing dependence-forming nicotine. Chewing tobacco in paan was reported by these younger participants as an **alternative nicotine** source that could be adopted in smoking cessation attempts. However, whilst this use of traditional chewing tobacco might reduce cigarette smoking, it would not necessarily reduce cravings for nicotine. One participant reported the realisation that the nicotine in traditional chewing tobacco, used to successfully achieve smoking cessation, would **continue to support dependency**: *In order for me to give up smoking I had to chew paan . . . once the urge to smoke went away I also stopped chewing paan . . . chewing was also very difficult to give up. (18-29 years, born outside UK, successful attempt)* Other respondents had successfully stopped cigarette smoking, but had started to chew tobacco in paan because of their acknowledged **craving for nicotine**, and a wish not to access this through smoking cigarettes: *Since giving up I started to chew paan . . . I am trying to give up, but sometimes Iam still craving . . . nicotine was helping me not to smoke. (18-29 years, born outside UK, successful attempt)* *As a result of giving up smoking I took up chewing. I would chew large amounts of process tobacco. (30-49 years, born outside UK, successful attempt)*	This paper mostly deals with views of smoking and smoking cessation, however, some data was relevant to smokeless tobacco.

Study details	Population and setting	Methods	Findings	Notes
Author: Croucher et al **Year**: 2002 **Setting / country**: Tower Hamlets, London, UK **Aim of study**: to establish the prevalence of paan chewing with tobacco by UK-resident Bangladeshi women and the extent to which they manifest nicotine dependence **Study design**: cross-sectional survey + interview **Funding**: NHS Executive North Thames Inner City Health research program **Quality**: ++	**Number of participants**: 242 Bangladeshi Women from a list of 372 **Mean Age**: 35.4 years (95% CI 33.9–36.9 years) (18-60 range) **Gender**: 100% Women **Other**:	**Data collection methods**: Bangladeshi women were selected at random from the current electoral register, who supplied a saliva sample for cotinine and an expired air sample for carbon monoxide analysis. Participants provided saliva by keeping a cotton-wool dental roll in the mouth until saturated. They also participated in a structured interview assessing knowledge, attitudes and behavior with respect to tobacco use. Piloted tool. 2 female bilingual speakers conducted interview in preferred language of participant. **Data Analysis**: data were analyzed using STATA **Attrition**: response rate was 73%. 33 of the potential participants declined to take part, 56 could not be contacted 41 potential participants moved.	**Main Themes relevant to research question**: The prevalence of chewing paan quid with tobacco was estimated as 48.5% (95% CI 42.01–54.98). Tobacco users (whether they chewed or smoked) were significantly older, had a shorter current chewing career than those chewing paan without tobacco, were more likely to describe their reason for chewing as habit, and were more likely to have their first paan quid within 1 h of waking Reason for chewing, self-evaluation of health risk, and intention to give up tobacco use were not significantly related to cotinine concentrations. Higher cotinine concentrations are significantly associated with frequency of consumption, consumption of the first paan quid with tobacco within 1 h of waking, the use of leaf tobacco in the paan quid, the desire to quit tobacco use, and the perceived difficulty of going without tobacco for a day. Reason for chewing, self-evaluation of health risk, and intention to give up tobacco use were not significantly related to cotinine concentrations. **Responses are from pan chewers:** **Reason for chewing (n=103)** Habit 61.2 % Refreshing 12.6 % Good for teeth 22.3 % Other 3.8% **Is tobacco bad for health? (n=93)** Bad 89% Good 10.8% **Do you wish to give up using tobacco? (n=92)** Yes 80.4 % No 19.6% **How much do you want to give up using tobacco? (n=92)** Not at all 13%	

Study details	Population and setting	Methods	Findings	Notes
			Moderately 19.6 % Strongly 67.4% **Intention to quit (n=103)** None 21.4 % Moderate 33 % Strong 45.6 % **How difficult is it for you to go without tobacco for a day? (n=92)** Easy 28.3 % Difficult 71.7 %	

Study details	Population and setting	Methods	Findings	Notes
Author: Croucher at el **Year**: 2007 **Setting / country**: Tower Hamlets, London, UK **Aim of study**: to establish the point prevalence of CCT use in a randomly selected sample of UK-resident Bangladeshi males, compare CCT users with other tobacco users (smokers alone and chewers alone), and model the factors for CCT use and chewing tobacco use alone. **Study design**: Cross sectional survey **Funding**: Medical Research Council Research Studentship **Quality**: ++	**Number of participants:** 301 interviews included in the analysis **Mean Age**:40.7 years **Gender**: 100% Men **Other**: 89% reported that they had been born in Bangladesh The average length of UK residence of the Bangladeshi-born was 24.8 years 71% were married, with 3.5 average children.	**Data collection methods**: Bangladeshi men aged 18 years and over, residing in the borough, included in the electoral register, and are willing to take part and capable of answering the interview schedule were recruited into the study. Initial list of 325, an initial response rate of 59 percent. The replacement list was then used until 325 interviews were completed. A random sample of Bangladeshi men was selected from the current Tower Hamlets Electoral Register Muslim–Bengali names were identified using a standardized protocol the addresses of potential participants were selected using a computer random number generator The amended interview schedule was piloted with 15 Bangladeshi male respondents. The robustness and cultural validity of the interview schedule was established in four focus group discussions involving 27 Bangladeshi adult men. Bilingual survey administer by 2 bilingual interviewers in preferred language of participant. **Data Analysis**: 301 interviews were included in the analysis. Level of significance of 5 percent and a power of the test of 95 percent, it was calculated that a sample of 260 should be recruited to establish the study objectives The data was analyzed with STATA. Frequency distributions are	**Main Themes relevant to research question**: 36% reported that they were tobacco smokers alone, while 8% were tobacco chewers alone. combining tobacco chewers alone with concurrent CCT users indicated that 30 percent were tobacco chewers. 22% of the respondents reported that they were CCT users, i.e., both smokers and chewers. Tobacco smokers alone were younger and tobacco chewers alone were older. Tobacco chewers alone and CCT users were more likely to have had no education. Tobacco chewers were more likely to rate their health as average or poor. The number of chronic illness episodes was greater in tobacco chewers alone. Tobacco chewers alone and CCT users were more likely to report current oral pain. Tobacco chewers had the lowest mean social capital score. Examination of individual social capital items showed that only 5 percent of the respondents' wives were reported to smoke, compared with 50 percent who used chewing tobacco. 83% of tobacco chewers, compared to 23 percent of tobacco smokers alone, also had a wife who chewed tobacco Tobacco chewers alone were significantly likely to chew more than 10 paan daily, compared to CCT users who were more likely to chew between one to four paan daily ($P < 0.01$) Other significant variations showed that tobacco chewers alone were more likely to have their first chewing tobacco intake within 30 minutes of waking, were more likely to have more chewing tobacco intakes at the beginning of the day, and would most hate to give up these morning intakes. Tobacco chewers alone were also more likely to chew tobacco leaf (44 percent versus 14 percent, $P < 0.05$) and to carry a paan box when outside their homes compared with CCT users (38 percent versus 13 percent, $P < 0.01$).	concurrent tobacco (CCT)

Study details	Population and setting	Methods	Findings	Notes
		presented and comparisons made using the Pearson Chi-square test. Binary and multinomial logistic regressions modeled the relationships between nicotine dependence, social context of tobacco use, and types of tobacco user **Attrition**: Initial response rate 59%, but then sampled until 325 interviews were complete. Reasons for nonparticipation, in order of magnitude, included no longer being at the address, refusal, illness, and temporary absence because of travel overseas.	**Responses (n=89)** CCT Chewers Reason for chewing: a habit: *65%* 66% First chew within 30 minutes of waking: *44%* 16%East to go without tobacco 25% 35% First chew hate to give up most: *67%* 17% Chew tobacco when ill: *48%* 36% Chew tobacco more at beginning of day*:* *64%* 23%Other tobacco chewer at home: *87%* 78% Want to give up chewing tobacco: *57%* 54% Tried giving up chewing tobacco: *67%* 86% Chew tobacco leaf: *44%* 14% Swallow chewing tobacco juices: *65%* 73% Carry a paan box*:* *38%* 13%	

Study details	Population and setting	Methods	Findings	Notes
Author: Csikar et al **Year**: (N.D) unpublished research paper **Setting / country**: Leeds, Bradford, Calderdale, Kirklees and Wakefield, West Yorkshire, UK **Aim of study**: To determine what proportion of dental practitioners report ability to identify ST users among their patient populations, assess knowledge regarding the habit and perceived training needs. **Study design**: Cross-sectional questionnaire **Funding**: NHS Leeds Priorities and Needs Funding **Quality**: +	**Number of participants**: 507, but useable sample was 372 out of 867 mailed. **Mean Age**: NR **Gender**: 40%Women 60% Men **Other**: **Practitioner's Base** Leeds (32%, N=117) Bradford (27%, N=99) Kirklees (19%, N=71) Wakefield (14%N=53) Calderdale (9% N=32). Year of **graduation** from dental school ranged from 1957-2005 with a median of 1989. 47% work in a performer role 29% performer/ provider 17% as solely provider	**Data collection methods**: As part of a larger study, a five page piloted questionnaire was mailed to all primary care dentists in West Yorkshire (Leeds, Bradford, Calderdale, Kirklees and Wakefield). This was one element of a survey that covered aspects of health promotion carried out in dental practices. Databases were obtained from West Yorkshire Central Services Agency with permission from the local Consultant in Dental Public Health. 867 dental practitioners were mailed, 507 (58%) practitioners returned their questionnaires (answering the questionnaire or refusing). Those who had moved or felt their role was not applicable (N=34) were removed from the database and a revised sampling frame of 833 was adopted yielding a 45% response rate. **Data Analysis**: The data were coded and entered into SPSS 12 for basic analysis to generate frequencies and percentages. Data were analysed using Chi-square tests and a 95% confidence interval adopted. **Attrition**: 58% return rate (45% revised response rate)	**Main Themes relevant to research question**: 156 dentists were aware of the **oral health impacts** caused by ST, of whom, 50% (N=78) considered ST to be a significant **problem to their patients**. 279 would like to **access resources** on ST. The practitioners were asked if they were **aware of any of their patients were using smokeless tobacco**, 99 said "yes (27%). Practitioners were also asked to gauge the proportion of their practice **caseload** that used smokeless tobacco. There were 9% (N=32) of practitioners claiming that they saw between 3-20% of patients who were ST users. A statistical difference can be seen in practitioner's awareness of their patients using smokeless tobacco by area. There were proportionally more practitioners in Bradford who claimed they saw smokeless tobacco users than practitioners from other areas in West Yorkshire (P<0.05). Dentists were asked to list those **smokeless tobacco products** that they felt that their patients may use (multiple responses). Paan with tobacco (N=78, 42%) was cited most frequently amongst the respondents, followed by paan with areca nut (tobacco not specified)(N=53, 29%), Gutka (N= 21, 11%) and paan masala (N=34, 18%). Of the 372 responders, 156 dentists responded when asked if they were aware of the potential **harm caused by smokeless tobacco** within the oral cavity. Out of the 156 responses, 50% (N=78) considered smokeless tobacco to be a **significant problem.** The respondents from Bradford and Kirklees had a greater proportion of practitioners who considered smokeless tobacco to be a significant problem, whereas the respondents from Leeds had a greater proportion of practitioners who did <u>not</u> see smokeless tobacco as a significant problem. Respondents were asked about whether they would like to **access any resources on smokeless tobacco**, 279 (75%) said "yes". The highest proportion wanted a simple guide to help them to talk to patients about smokeless tobacco (32%, N=90) followed by resources for the waiting room (30%, N=84), help with oral cancer detection (22%, N=62) and training on smokeless tobacco (15%, N=43)	Unpublished study- Results from an exploratory survey in West Yorkshire. Sent by email after requesting more information from the author.

Study details	Population and setting	Methods	Findings	Notes
Author: Health Development Agency (HDA) **Year**: 2000 **Setting / country**: UK **Aim of study**: to ascertain appropriate methods of intervention for reduction of tobacco use among black and other minority ethnic groups. **Study design**: Qualitative (focus groups and interviews) **Funding**: commissioned by the Health Education Authority (HEA) and conducted by Surrey Social and Market Research, at the University of Surrey, examine the role of tobacco use m black and minority ethnic groups **Quality**: NA	**Number of participants**: 16 interviews with key informants 36 focus groups (+4 more focus groups added later) **Age**: Mixed ages **Gender**: Mixed gender groups **Other**: Participants reflected a diverse range of religion, Educational attainment, employment status, gender, age, language and place of birth.	**Data collection methods**: 16 interviews with key informants from local health authority health promotion units, community health educators and community leaders .36 focus groups of between 8 -10 participants (316 individuals) (22 with South Asian participants and 14 with African-Caribbean groups) 4 Additional focus groups with eight Bangladeshi male participants over the age of 16 years Some of the Pakistani, Indian and Bangladesh participants were recruited with the help of key informants and through community networking. Once an initial sample was established the remainder of the Indian, Pakistani and Bangladesh participants were recruited using the snowballing method **Data Analysis**: **Attrition**:	**Main Themes relevant to research question**: **Health campaigning in Asian media** ▪ Primary source of health information for the majority of South Asians was from Asian broadcast media. ▪ Effective health promotion should include an increase in the dissemination of information on Asian television and radio about the health risks of tobacco. ▪ Such information provision will not only overcome some of the Linguistic and cultural boundaries associated with print, but will ultimately reaches greater South Asian audience, particularly among older members who rely solely on Asian media for information. ▪ there is currently a dearth of health Information regarding the risks of chewing tobacco and paan and as such, broadcast information should specifically highlight the health risks associated with this type of tobacco behaviour. ▪ In terms of printed media, while younger South Asian participants tended to use Asian magazines as an information source about health Issues, older participants were more reliant on Asian newspapers. This would suggest that these forms of printed media are also a good resource for health promotion within this community **Multi-language and culturally familiar printed information** ▪ The majority of participants In this study stressed that printed health information, such as leaflets and posters were inaccessible This was particularly so among South Asians, who tended to be culturally unfamiliar with the reformation and also encountered language difficulties. ▪ recommended that information leaflets be printed in all languages to reach each target group effectively and leaflets should be written m a style that IS simplistic and more 'culturally familiar'. ▪ Should draw upon the experiences of members of these groups and to use 'vignettes' based on these experiences to highlight specific aspects of the health **Consistent health information** ▪ a need for a nationally coordinated public information resource, ▪ The service should have the scope to deal with a multi-language population ▪ A national agency can provide an authoritative source of information regarding the risks of smoking (and tobacco use), and attempt to regulate, through endorsement, the consistency of other tobacco reformation that is available to the public. **Promotion of alternative methods for indigestion relief among South Asians** ▪ The findings show that tobacco use often used as an indigestion reliever among	**Tobacco and England's Ethnic Minorities**

Study details	Population and setting	Methods	Findings	Notes
			South Asians. ▪ members of these groups are often distrustful of pharmaceutical drugs, particularly Bangladeshis, other, more natural remedies could be promoted as a substitute for using ▪ tobacco or paan for indigestion ▪ the promotion of these products should also run alongside information campaigns that highlight the harmful effects of tobacco chewing. **Community based work** ▪ demand for information based strategies appeared to be the most Important aspect in encouraging tobacco cessation, the acceptance of such culturally unfamiliar information is a crucial' aspect to consider m the promotion of healthy living. ▪ the relationships between tobacco related behaviour and culture, tradition and religion are particularly strong. this needs to be integrated into any successful tobacco cessation campaign. **The following recommendations are founded upon this premise:** ▪ the greatest response to health information derives from face to face contact with community members. but there is very little community health support specifically for tobacco users in most areas. ▪ Opportunities for grassroots interventions at community level ▪ Community based strategies should involve community members conducting support groups and workshops in a culturally familiar manner. (i.e religious and community leaders, peer groups) ▪ Doctors' surgeries and health centres could be an information source and provide sources that will aid tobacco cessation. ▪ For example, the study highlighted the relationship between smoking and stress among many South Asian participants, so alternative practices (such as acupuncture and yoga sessions) that help relieve stress could be provided, and subsidised **Future research should explore the following:** ▪ Action research, which would allow for a participant centred approach to both data collection and promoting tobacco cessation. ▪ Community based action research would be helpful ▪ also utilising religion as a facilitator for cessation **Views of respondents** **Chewing** ▪ Paan was used among most Indian, Pakistam and Bangladesh participants and age of first use varied, some started in pre-teens in a family setting.	

Study details	Population and setting	Methods	Findings	Notes
			▪ Chewing was prevalent among the older participants, It was growing m popularity among the younger participants who were born in the UK ▪ Some younger people avoid ST since it might stain teeth and lips, these youth also tried to discourage family from using ST and offered cigarettes as an alternative. **Reasons for chewing** **Culture and tradition** ▪ Desires to continue traditional practices among the Indian, Pakistan and Bangladesh older participants. ▪ Ritual, sharing, social activity of chewing and smoking. ▪ Passed down from generations- pass tradition along through generations **Social activity** ▪ Social activity among friends/family. ▪ The chewing of tobacco appeared central to the sharing experience **Stress and boredom** ▪ Chew to relax in times of stress ▪ Relieve tension, something to do **Perceived state of health in relationto chewing** ▪ Most Indian, Pakistani and Bangladesh participants saw little correlation between health risks and tobacco or the chewing of paan ▪ Instead, concern tended to be focused around three specific health problems. mouth ulcers cancer of the pallet and dental problems. **Perceived future health in relation to chewing** ▪ Because the relationship between chewing paan and health risks was rarely raised m the focus groups, It would appear that participants had very little understanding of the effects of paan chewing on their health. ▪ Instead the importance of chewing as a cultural tradition appeared to overshadow any potential concerns of the health risks ▪ Overall, participants, particularly the older Bangladeshis, were convinced that chewing paan was an ancient tradition that had little effect on health	

Study details	Population and setting	Methods	Findings	Notes
Author: Longman et al. **Year**: 2010 **Setting / country**: Leicester and Tower Hamlets, UK **Aim of study**: to audit of observed retail practice with respect to chewing tobacco products. **Study design**: Questionnaire, and land survey **Funding**: Cancer Research UK **Quality**: +	**Number of participants**: **NA** **Mean Age**: NA **Gender**: NA **Other**:	**Data collection methods**: Wards with high proportions or numbers of residents from the South Asian community were identified using 2001 Census data. Within each ward product purchasers identified retail outlets and purchased chewing tobacco products from them Bi-lingual product purchasers, most commonly community health development workers, were recruited from Primary Care Trusts local to our target areas. The outlets included supermarkets, newsagents, music shops and book shops. Product samples were purchased until no new products were available. However, data continued to be collected on all the subsequent screened premises until the whole ward had been visited. Data extracted from each product included: the name, batch number, product category, contents, name, place and date of manufacture, packaging material, target group, language on packaging, detail of health warning, quantity and price. For every identified premise that sold chewing tobacco the product purchaser completed a questionnaire. **Data Analysis**: statistical analysis: excel SPSS Software. Mean scores and 95% confidence intervals. **Attrition**: NA	**Main Themes relevant to research question**: **Premises** Chewing tobacco products were found in a broad variety of premises in all but one ward, and were easily accessible. The number of outlets selling chewing tobacco varied across the wards, with the highest concentration of outlets in Leicester and Tower Hamlets There were 45 premises selling chewing tobacco products. The number of outlets selling chewing tobacco varied across the wards, with the highest concentration of outlets in Leicester and Tower Hamlets. The outlets included supermarkets, newsagents, music shops and book shops. Warning notices for underage sale were present in 53% of premises. Forty nine per cent also sold cigarettes. It was observed that whilst cigarettes were only sold in gantries behind the counter, 38% of outlets sold chewing tobacco products in front of the counter. Warning notices for underage sale were present in 53% of premises. Forty nine per cent also sold cigarettes. It was observed that whilst cigarettes were only sold in gantries behind the counter, 38% of outlets sold chewing tobacco products in front of the counter. **Products** 98 products were identified and purchased with a mean price of £1.82. Of the 94 pre-packaged products purchased only 15% (95% CI: 8%, 22%) complied with legal health warning requirements. Freshly made-to-order paan was available in 14 premises and four such products were purchased. These freshly made products were packaged in non-rigid plastic bags without listing the ingredients, date of production, weight of product, excise duty paid or health warning. Chewing tobacco products were found in all wards with the greatest variety being found in Spitalfields and Banglatown (Tower Hamlets) and Latimer (Leicester).	**This study focused on an audit of availability of ST products.**

Study details	Population and setting	Methods	Findings	Notes
			The mean price of all chewing tobacco products was £1.82, the mode £1.00 and the median £0.75. **Health warnings** Of the 94 pre-packaged products, 93% had some English language information ranging from product name only to a full ingredients listing. 48% of the products purchased had any form of health warning and only 15% (95% CI: 8%, 22%) complied correctly with the current legislative requirements 71% of products from Bangladesh did not have any health warning. All those Bangladeshi products that did have a warning did not adhere to the current English legislative requirement. Products from India were much more likely to have a warning but over half (58%) of these were observed to be incorrect.	

Study details	Population and setting	Methods	Findings	Notes
Author: Nathan **Year**: 2010 **Setting / country**: Harrow, North London, UK **Aim of study**: To assess dentists' awareness and provision of areca cessation counselling to patients in general dental practices in Harrow **Study design**: cross-sectional questionnaire **Funding**: NR **Quality**: +	**Number of participants**: 83 Dentists out of 150 replied to questionnaire. **Age**: n (%) 21-30: 11 (13) 31-40: 30 (36) 41-50: 18 (22) 51-60: 20 (24) 61+: 4 (5) **Gender**: 35% Women 65% Men *out of 77 respondents who specified gender **Other**: Education: 69 held UK qualification, while 2 had overseas Ethnicity %: Asian Indian: 59 Asian other: 6 White British: 20 Asian Chinese: 4 Other: 9 Use of Areca n: Yes: 1 No: 82 56 (67.5%) provided Areca counselling. No significant gender differences. No significant differences in age and offering counselling	**Data collection methods**: 150 general dentists in the Primary Care Trust NHS Harrow area. Invited through phone directories listings and/or had contract with Harrow PCT. **Data Analysis**: Descriptive statistics and Chi-squared tests. **Attrition**: response rate of 57%	**Main Themes relevant to research question**: Dentists were nearly twice as likely to neglect to provide patients with areca cessation counselling (32.5%) than to neglect to provide tobacco cessation counselling (16.9%). Dentists' comments revealed a lack of awareness and the materials and support needed to counsel patients in areca cessation. Asian/African origin dentists were more likely to offer areca counselling (p 0.006 significant). 75% of this group provided counselling compared to 43% of white dentists. Dentists commented on the lack of information about areca and its relevance to their patients, and a lack of support for counselling. Many dentists commented on the lack of resources available for counselling, and the number of patients in need. This was contracted with positive views of smoking cessation support/resources. No dentists commented that they were unaware of the dangers of tobacco, that they did not see patients with this habit, or that patients were unaware of the cancer and tobacco link.	Survey had qualitative component as well.

Study details	Population and setting	Methods	Findings	Notes
Author: Pearson et al **Year**: 1999 **Setting / country**: Tower Hamlets, London, UK **Aim of study**: To assess the use of dental services, barriers to uptake of dental care and attitudes to regular dental examinations and the prevalence of tobacco and paan chewing habits in a group of Bangladeshi medical care users. **Study design**: cross-sectional Interviews **Funding**: NR **Quality**: +	**Number of participants**: 158 out of 185 approached **Mean Age**: 56.1 years (range 40- 83) **Gender**: 42% Women 58% Men **Other**: All subjects were first generation Bangladeshis. 6% (n = 10) of the study population lived alone. The average length of residence in the UK was 24.5 years, with a range from 54 years to less than 1 year. 65% (n = 50) of females had lived in the UK for 17 years or less while only one male had lived in the UK for this period of time.	**Data collection methods**: Bangladeshi adults aged 40 years and over attending general medical practices in Tower Hamlets. Recruited from four general practice waiting areas Two Sylheti speaking interviewers from the Bangladeshi community were used. A range of data was collected using a structured interview schedule **Data Analysis**: The chi-squared test was used for the statistical analysis of the categorical data, and a statistical significance level of 5% was adopted **Attrition**: Response rate of 85%. The minimum sample size required was estimated to be 149 people. The sample size was calculated to give a standard error of less than 0.04 and the following assumptions were made: a population of 26,000 people, the 95% confidence interval level and a prevalence of 50% for all conditions	**Main Themes relevant to research question**: 20% of subjects claimed to be **registered with a dentist** yet 33%of subjects had visited the dentist in the last year. 25% of subjects had **never visited** the dentist. 73% experienced **language difficulties** in their general use of health services and more females (94%) than males (58%) experienced difficulties (P < 0.001) 78% chewed paan. **Tobacco was** added by 52% of those who used paan. The **habit was adopted as early** as 6 years of age and as late as 56 with a mean age of 20.91 (SD = 11.45). However, 50% were chewing paan by the age of 17 years More males began chewing paan by 15 years of age than females (P < 0.05). Paan was consumed lightly (one to three times daily) by 32% of chewers but 18 (11%) chewers were heavy users (chewed 8+ times a day). It was found that females chewed paan more frequently than males. **Females are much more likely to use paan** than males and add tobacco to their quid (P < 0.01). When frequency of chewing is looked at more females are heavy chewers and more males are light chewers (P < 0.001) Of those who had chewed paan more males (25%) than females (5%) had abandoned the habit (P < 0.01). Only 6% of the study population had **never chewed paan**. 43% **did not know** that paan chewing could be **bad for health**. More females (49%) than males (38%) were unaware of the possible harmful effects of paan chewing. Almost a quarter of subjects (23%) believed that it is **good for dental health.** The **reasons cited** were that it stops pain in the teeth and gums, and keeps teeth strong. Paan was also used to aid digestion and to keep the mouth fresh. For those subjects who believed paan was bad for health it was believed to be bad for the mouth and stomach and some subjects mentioned diabetes. Subjects who chewed paan eight times or more a day were more likely to believe that paan was good for health than those who either did not chew or chewed it less	

Study details	Population and setting	Methods	Findings	Notes
			than eight times a day (P < 0.001). 14% of the study population volunteered the fact that they were addicted to it.	

Study details	Population and setting	Methods	Findings	Notes
Author: Prabhu et al **Year**: 2001 **Setting / country**: East London UK **Aim of study**: Ascertain level and predictors of betel quid (pan) chewing in Bangladeshi adolescents **Study design**: Cross sectional questionnaire **Funding**: NR **Quality**: +	**Number of participants**: 204 responded out of 290 recruited **Mean Age** 12 years, 24 (11·8%); 13 years, 12 (5·9%); 14 years, 31 (15·2%); 15 years, 24 (11·8%); 16 years, 44 (21·6%); 17 years, 29 (14·2%) 18 years, 40 (14·2%). **Gender**: 48.5% Women 51·5% Men **Other**:	**Data collection methods**: Youth recruited from Bangladeshi cultural centres in East London. Consecutive adolescents attending 4 randomly selected centres. Snowball sampling and 4/7 centres were randomly selected A piloted self-completed questionnaire **Data Analysis**: Descriptive statistics and appropriate univariate analyses were used to assess possible relationships between chewing behaviour and demographic characteristics All relationships for which the null hypothesis had a probability of less than 0·2 were tried in forward stepwise logistic regression models (JMP, SAS). The level of alpha was predetermined at $P = 0·05$. **Attrition**: 70% response rate	**Main Themes relevant to research question**: 58 participants (28·1%) chewed betel quid (similar between genders). 52% did so on at least most days and 97% did so at least every month. Forty-seven (81%) of the teenagers chewed betel quid whilst with their parents and the parents of two others knew that their children chewed. Forty-seven (81%) of the teenagers who chewed obtained their betel quid at home. 7 (12%) **added tobacco** or processed tobacco (zarda) to their quids, all of whom were aged 16 years and over. A further 3 participants used pan masala The median age of **first chewing** was 9 years (95% central range = 7–11·6 years). 86% of those who chewed pan had **started chewing** whilst in England **Adolescents who chewed pan** were more likely to agree that it **tasted good**, had less negative attitudes to the **effect of pan** on the appearance of the teeth, were less likely to agree it **caused cancer** and were also more likely to come from families with lower levels of parental **education.** There was a strong confounding effect between attitudes to pan. That is to say that those who liked the taste and did not think it adversely affected the appearance of the teeth also tended to think it made their teeth and gums stronger. 38% (21) contemplated giving up paan of whom 90% (19/21) had decided to give up; however, only 5/19 had managed to quit paan use. 36% (73) believed paan was a risk factor for cancer.	

Study details	Population and setting	Methods	Findings	Notes
Author: Rees **Year**: 2007 **Setting / country**: Leicester, UK **Aim of study**: to provide information and promote discussion on tobacco related substances **Study design**: Report/briefing **Funding**: NA **Quality**: NA	**Number of participants**: NA **Mean Age**: NA **Gender**: NA **Other**: People from an Indian background constitute a quarter, while people from Pakistani or Bangladeshi backgrounds make up around 3%, of Leicester's total population	**Data collection methods**: briefing arose out of a series of workshops in December 2006, which sought to add clarity to the current situation, regarding the use of tobacco related substances. **Data Analysis**: Narrative summary **Attrition**: NA	**Main Themes relevant to research question**: Around a minimum of **17,000** people in Leicester **chew tobacco** products and in doing so are exposing themselves to significant health risks.(Based on data from Leicester Lifestyle Survey 2002) Problems also arise because of the use of paan by a significant proportion of people as an aid to **oral hygiene**, many of whom do not visit a dentist. chewing paan with tobacco may **mask the pain** symptomatic of dental diseases. **Cultural Values and Perceptions** • Local evidence testifies to the **traditional role of smokeless** tobacco and its central position in South Asian **culture**, which is maintained in the U.K. even amongst the third generation. Use serves **religious** and **cultural purposes** at weddings, fairs, holidays and other important events. • Local community workers report that paan is commonly used to **welcome guests**, seal alliances/ deals and suggest that there could even be an increase in its use locally, as a way of confirming and maintaining **ethnic identity** and cultural traditions. • Front line staff from both the Leicester City Council and the Leicester City PCT have suggested that smokeless tobacco products are so **firmly part of South Asian heritage** and culture, that they are much more embedded in society than cigarettes are. This has i**mplications for smokeless tobacco campaigns/ interventions**. ▪ Traditional Hindu medicine says that chewing paan aids digestion, freshens the breath and strengthens the heart. • **Misleading health benefits** are often purported by manufacturers, such as - Paan and guthka are digestive aids; Supari improves memory; Gutkha users can perform superhuman feats. The HEA 1999, Black and minority ethnic groups and tobacco use in England raised the issue, that despite the apparent low level of usage of smokeless tobacco, there was concern regarding the **easy availability of paan in Asian shops** and, in particular the lack of warning labels on paan packages. H.M. Regarding availability in Leicester, the report Gutkha: Sales of South Asian Tobacco Chewing Products in Leicester City, produced by LCC and Leicestershire Tobacco Paan Action Group, 2000 identified that: • Gutkha, which is **banned in many Indian states**, is easily available in Leicester. • That the **range of outlets** for Smokeless Tobacco had increased with the arrival	This is a report and not the source of reported research is often unclear.

Study details	Population and setting	Methods	Findings	Notes
			of gutkha and that gutkha was available in stores, which had no previous association with the traditional paan trade. • That the **market for gutkha appeared to be growing**, with new outlets opening and a, steady increase in popularity since 1997. • The main purchaser group was given as **males between 20 and 60 years.** However, it was noted that "there appears to be a distinct and possibly growing market amongst female users. That majority of purchasers **originated from India**; with the minority from Bangladesh, Pakistan and possibly Somali. That a wide range of smokeless tobacco products was available from **20p to £10**. • That contents were **not necessarily listed in English**. • That most retailers were aware of an **age restriction** on the sale of products but only a few displayed a statutory notice to this effect. • That there was a **general awareness of health risks** but few traders were able to be specific. The self reported Leicester Lifestyle Survey (2002) found that 6% of all respondents (aged 18 years and over) used chewing tobacco, paan masala and other tobacco products, and that 8% of the South Asian population, used these tobacco products. **What's Currently Happening?** • Saeed Malek, **STOP! Smoking Advisor** has successfully supported heavy smokeless tobacco users to stop, by using Nicotine Replacement Chewing Gum and behavioural support at his regular STOP! smoking clinics. • A range of culturally sensitive and **tailored public health education messages**. Presentations, workshops, information stands, leaflets and posters continue to be used, especially during culturally important events, to target at-risk communities. • Workshops to enable staff to share knowledge and raise awareness of the issue have been held. • Community Health Development Workers are involved in working to address the issue. • The issue of smokeless tobacco has been included in a number of STOP! Advisor training programmes.	

Study details	Population and setting	Methods	Findings	Notes
Author: Summers et al **Year**: 1994 **Setting / country**: inner city Leeds and Bradford, Yorkshire, UK **Aim of study**: to determine the use of betel quid **Study design**: interviews, semi-structured questionnaire **Funding**: Yorkshire Cancer Research Campaign **Quality**: +	**Number of participants**: 296 first generation Bangladeshi women **Mean Age**41.2 (range 25-68): years **Gender**: 100% Women **Other**: 144 never attended school Mean length of residency: 8.7 years (range <1-25y) 98% understood no or little English. 48% illiterate	**Data collection methods**: Families in deprived areas of the two cities were recruited by 3 bi-lingual interviewers. It was planned to recruit 150 in each area. Interviews took place in the home. **Data Analysis**: qualitative data was coded using a database programme, and x^2 test was used for stats. **Attrition**: NR	**Main Themes relevant to research question**: Pan was **used** by 95% of women, of whom 62% added tobacco in leaf form, and as a component of zarda in 27% of women. 1-5 quids consumed daily by 37%. Mean **age of onset**: 17years, but 18% were chewing by 10 years of age. Those who consumed more **pans daily** were significantly older, less literate. Had lower educational attainment, and were more likely to believe that chewing was beneficial. Burnt tobacco leaves were used as **oral hygiene aid** in 20% 58% never visited a dentist, of these, 79% felt it was not necessary. 62% thought chewing was good 20% bad 13% neither good or bad 5% did not know **Why use pan? %** Habit: 34 Pleasant and refreshing: 22 Positive health benefits: 12 Aid Digestion: 11 Relieves pain: 6 Some women believed it made their lips look **attractive** or occupied their **time**. 39% would **quit** if a doctor suggested it. Those who chewed less than 10 betel quids per day were more likely to consider this than those who chewed more (p <0.001)	

Study details	Population and setting	Methods	Findings	Notes
Author: Vora et al **Year**: 2000 **Setting / country**: Leicester, UK **Aim of study**: To determine use of alcohol, tobacco and paan among Asian and assess their knowledge and attitudes towards oral cancer risk factors and prevention. Also, to determine any differences regarding habits and attitudes between first and second generation Asians. **Study design**: Cross-sectional survey **Funding**: NR **Quality**: +	**Number of participants**: **n=524** First Generation N=233 Second Generation N=291 **Mean Age**: 47.5 years (1st gen) 21.2 years (2nd gen) **Gender**: 100% Men **Other**:	**Data collection methods**: Recruitment from GPs' surgeries, sixth form colleges and places of worship Confidential, bilingual questionnaire regarding alcohol, tobacco and paan use and also knowledge about oral cancer risk factors and preventive measures **Data Analysis**: Statistical analysis for significance for the differences observed in the contingency table data produced in this study was performed by the use of the χ2 test,using the null hypothesis that no difference was to be expected between the various groups. **Attrition**: NR	**Main Themes relevant to research question**: Paan (Betel Quid) use among Leicester Asian males in the study group-: (percentage of users who added tobacco to pans in brackets) (n= total number of pan users in study group total, with or without tobacco added) 1st Generation: Hindu (n=8/38) 21% Sikh (n=0/2) 0% Muslim (n=1/20) 5% Jain (n=1/20) 5% **2nd generation** Hindu (n=2/61) 3% Sikh (n=0/5) 0% Muslim (n=0/18) 0% Jain (n=1/7) 14% Among 1st generation Asian males, approximately 50% had heard of oral cancer, except for the Sikh group where only 17.5% of the sample group had heard of the condition. This difference was highly significant (χ2, p<0.001). **Source of their knowledge**: over 50% of Hindu,Jain and Muslim males stated that they had **heard of oral cancer from the press and media**. Approximately 10% of those who had heard of oral cancer **knew of someone** with the condition. 75% of 2nd generation Jains had heard of **oral cancer**, compared with 43–48% in the other 2nd generation groups (χ2, p<0.1). A greater proportion of 2nd generation Sikhs (48%) had heard of oral cancer compared with their first generation elders(17.5%) (χ2, p<0.01). **Sources of knowledge** for 2nd generation males included school/college education, the press and media, and health education leaflets. When 1st generation males were asked about **risk factors implicated in the aetiology of oral cancer**, significant differences were observed. 78% of Sikh males did not know or gave no response, compared with around 50% for the other community groups (χ2, p<0.01). Paan and areca nut chewing, and tobacco smoking were frequently given as **causative risk factors for oral cancer** by around 30% of Hindu, Muslim and Jain	A person was considered to be a second generation Asian if they were born and lived in the United Kingdom for all of their life; or, if born outside the United Kingdom, had been living in the country before the age of 16 years and had received primary and secondary school education in the United Kingdom.

Study details	Population and setting	Methods	Findings	Notes
			males A lower proportion of 2nd generation Sikhs (54%) gave no response for oral cancer risk factors compared with their elders (77.5% no response) ($\chi 2$, $p<0.05$). Approximately one third of the Hindu, Sikh and Muslim; and 50% of Jain males stated that smoking was a risk factor, followed by paan chewing. With regards to the **prevention of oral cancer**, a large proportion of 1st generation Sikhs (67.5%) gave no response/did not know, which was higher than the other community groups (43–54%) ($\chi 2$, $p<0.1$). Second generation Sikhs gave a better response rate compared with their elders (60% and 32.5% respectively giving a response) ($\chi 2$, $p<0.01$). Approximately 30% of 1st and 2nd generation males stated stopping tobacco smoking, stopping paan/areca nut chewing and keeping the mouth clean could help prevent oral cancer developing.	