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Effective behavioral interventions for smoking cessation in the primary care setting: A meta-analysis

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Abstract

There are a number of smoking cessation strategies offered by healthcare providers in Thailand. Despite this, the number of Thai smokers have stopped smoking permanently as a result of the strategies is still far less than the expectation of the National Strategic Plan for Tobacco Control. It feels that this is a reflection of the fact that there are a lot of delicate issues around use of the tobacco cessation service system. This research aimed to investigate the effectiveness of strategies for smoking cessation intervention among smokers in the primary care setting on point prevalence abstinence (PPA) basis. English and Thai language articles from 1993 to 2018 available from six databases were used as data sources. Two independent reviewers assessed articles against the following eligibility criteria: experimental study, adult smokers ≥ 18 years of age, studies comparing the effectiveness of a smoking cessation intervention with no treatment or wait-list control, or usual care. Study quality was critically appraised by two reviewers using established criteria; Review Manager 5.1 was used for meta-analyses. Of the 77 eligible studies that were found, 15 had complete data for meta-analysis on PPA and/or wait-list control, or usual care. The meta-analyses indicated that smoking cessation counseling using quitline telephone counseling was the most effective strategy for smoking cessation on PPA when compared with no treatment or usual care. Conversely, other interventions resulted in nonsignificant differences between the experimental and control groups. In summary telephone counseling was found to be the most appropriate approach for facilitating smoking cessation in adult smokers in the primary healthcare setting. Further research is needed to compare the optimal course length, intensity, and long-term effectiveness for helping smokers quit in the primary healthcare setting.

Keywords: Smoking cessation, intervention, smokers, primary care setting
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1. Introduction

Smoking cessation conducted by healthcare providers is considered as health benefits both smokers, and others who live closely. It is due to of the fact that tobacco use remains a very crucial leading cause of non-communicable disease globally [1]. Smoking cessation interventions undertaken by healthcare professionals have encouraged smokers to stop smoking permanently [2] –it was measured by point prevalence abstinence (PPA) [3, 4], and/or continuous abstinence rate (CAR) [4 – 6]. Evidently, behavioral counseling for facilitating smoking cessation, especially in the primary healthcare setting has been demonstrated that it is the most significantly effective smoking cessation intervention [6-13]. For offering smoking cessation in the primary healthcare setting, nurses play crucial roles involving identifying smokers, finding out the most suitable strategies for each smoker, as well as monitoring the expected outcomes in order to look after closely [14, 15]. Moreover, they usually appraise and comprehend the context facilitating smoking cessation accurately. However, there are a number of behavioral counseling characteristics for smoking cessation conducted for offering smokers to quit smoking constantly.

With reference to the prior studies, behavioral counseling intervention undertaken to enhance smoking cessation has been pointed out into diverse features. It can be divided into two main attributes in accordance with policy of the WHO Framework Convention on Tobacco Control (WHO FCTC) [16] comprising face to face counseling [4, 9, 10, 13, 17 – 19] and counseling via electronic devices, namely, cessation aid video [9], telephone counseling [6, 7, 10, 17, 20, 21]. text messenger [20], quit line website [4, 12, 18], and multicomponent electronic devices [22, 23]. In short, a variety of behavioral counseling interventions can be

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applied in particular contexts.

Even though, there are various methods to facilitate smokers quitting smoking in Thailand, the number of Thai smokers who can stop smoking permanently is still less than the expectation of the National Strategic Plan for Tobacco Control [24]. It has been illustrated that there was a significant decrease in smoking rate by 11% from 32.0% in 1991 to 21.9% in 2006, in contrast, it was a slight decrease by 0.5% from 21.9% in 2006 to 21.4% in 2013 [25]. It is reflected that there are a lot of delicate issues of smoking cessation system among Thai smokers needed to develop. According to the former studies stated that behavioral interventions in particular behavioral counseling can be used as standard smoking cessation intervention in every area, especially primary care setting. Moreover, smokers in the primary care setting cannot access cessation drug. Therefore, this paper aimed to investigate the effectiveness of behavioral interventions for smoking cessation among smokers in the primary care setting on point PPA. The meta-analysis was performed so as to strengthen the scientific evidences for smoking cessation strategies with a high statistical power and more robust point estimate from any existing studies. The finding of this study can be used as an empirical evidence for developing the behavioral intervention for smoking cessation in the primary care setting appropriately.

2. Methodology

This paper is a meta-analysis of the experimental research following Cochrane methodological guidline [26]. The PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) checklist and flow diagram were used to be a guideline for reporting the systematic review paper [27] .

2.1. Eligibility criteria

Eligible studies were experimental studies behavioral interventions for smoking cessation provided by healthcare providers among smokers aged over 12 years old. The selected studies intended to compare the effectiveness of smoking cessation intervention with no treatment or wait-list control, or usual care. Furthermore, the studies reported abstinence from smoking with at least a 1-month follow-up-30-day point prevalence abstinence, and/or continuous abstinence as the primary outcome were included. Report characteristics and study design: English and Thai-language quantitative studies employed an experimental design published since 1993 were included. Qualitative studies, editorials, letters, and commentaries, studies which could not be identified a full text, and articles that did not report the minimum information required were excluded.

2.2. Information sources and search strategy

Mixed automated and manual search strategy were employed. The databases from January 1993 to June 2018 were used to conduct comprising: PubMed, CINAHL Plus with full text, Cochrane Library, Web of Science, PUBMED, and SpringerLink. A combination of the constructs “smoking cessation”, “tobacco control”, “tobacco cessation”, “intervention”, “counseling”, “motivational interviewing”, “quit”, “stop”, “abstinence” and related keywords were searched in order to ensure broad coverage of published studies. Search terms were purposefully broad to ensure that all relevant articles would be captured.

2.3. Data collection process and data items

Eligible studies were coded to capture both substantive and methodological characteristics. The coding focused on the following features of the studies: identifying information, funding source, design, aims and objectives, variables related to the characteristics of participants, the nature of the intervention and its implementation, the nature of the comparison condition(s) and their implementation, analytical methods, follow-up duration and rates, and outcome measurements.

2.4. Risk of bias in individual studies

The Cochrane Collaboration tool for assessing the risk of bias [26] was used to investigate the quality of the selected papers.

2.5. Data synthesis:

Findings from systematic reviews were summarized and compared with findings from original research published beyond date ranges included in the reviews. Strength of evidence was used to assess the body of evidence. Moreover, Review Manager (RevMan5.3, The Cochrane Collaboration, Oxford, England) was used for meta-analyses. All the outcomes in this review were diclotomous outcomes and a weighted odd ratio was calculated if the same measurement scale was used. Heterogeneity was assessed by I^2 statistics. Heterogeneity is considered to be low if I^2 is $\leq$75%, and high if I^2 is > 75% [26]. A fixed effects model for meta-analysis was used. It is due to of the fact that the intervention effect was homogeneous (I^2 < 75%). For forest plots with sufficient studies included (> 10), funnel plots were generated to examine for the publication bias.

3. Results

3.1. Study selection

A total of 77 records were reviewed for eligibility, and 62 were excluded for the following reasons: full text was not available (n = 32), intervention did not meet the definition of “counseling” (n = 17), record

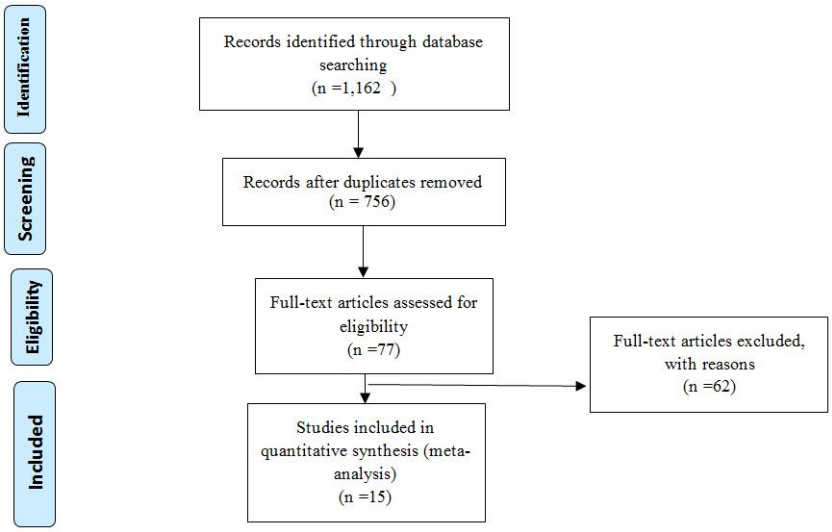

Figure 1: PRISMA flow diagram.

Abbreviation: PRISMA, Preferred Reporting items for Systematic Reviews and Meta-Analyses.

was not a published study (n = 3), smoking outcomes not reported (n = 7), and unable to calculate abstinence rates using available data (n = 3). (see Fig. 1)

3.2. Risk of bias within and across studies

Overall, the studies included in this review had a low risk of bias in most or all areas assessed.

Selection bias: Most studies used an automated randomization strategy that was considered low risk. Allocation concealment was not often described, but when studies were automated, allocation concealment bias risk was judged as low. For example, the study by McGrath, Zak [6] was judged to be at low risk since participants were not blinded.

Performance and detection bias: Performance and detection biases were evaluated the included studies with regard to personnel and their ability to influence outcomes and found most studies to be at low risk for performance bias. Most studies were conducted by personnel involvement in the delivery of the intervention. Therefore, some trials in which performance bias was judged as high risk. For instance, the study counselors giving motivational interviewing program were not blind to condition but interacted with all participants.

3.3. Participants

Participants participated in most of selected studies were in adult age group-average age was mid-30s to late 40s. The majority of studies enrolled a higher proportion of men (67.72%). Unless, some studies, namely, the study by Hollis, Lichtenstein [9] that 68% of participants were female with low socioeconomic status.

3.4. Intervention elements

This study reports 15 studies which were divided in according with The U.S. Treating Tobacco Use and Dependence Clinical Practice Guideline [28] (See Supplementary 1 https://goo.gl/5drQeh), including self-help, and counseling. However, all of selected interventions were counseling in a variety of characteristics as follows:

3.4.1. Face-to-face counseling

Five studies aimed to investigate the effects of counseling by providing information associated with cessation approaches using face-to-face counseling [11, 13, 17 – 19], two studies of the brief intervention using motivational interviewing by nurse [19, 29]. All interventions included nursing counseling, self-help materials, and follow-up contact either in person or by telephone; all were compared with usual care by health care providers, particular nurses, and physicians (brief advice to quit smoking, related self-help materials, or both).

3.4.2. Counseling via electronic devices

Seven studies intended to explore the effectiveness of counseling trough electronic devices as follows:

Telephone counseling–five studies of nurse counseling by quit line telephone [6, 7, 10, 13, 17, 20, 21] Participants were offered multisession telephone counseling, both reactive telephone couseling and proactive telephone counseling, lasting approximately 15 minute in the first time in order to provide intensive counseling. Then, they were arranged follow-up 3 – 4 times roughly 5 minutes after starting quit smoking until 6-12 months so as to prevent smoking relapse.

Self-help materials–three studies offered cessation technique by self-help materials [12, 17, 30],

Text messanger–two studies provided cessation technique via text messanger [20, 23],

Video–two studies delivered cessation technique via text messanger [9, 23].

All interventions included brief and intensive counseling, self-help materials, and follow-up contact either in person or by telephone; all were compared with usual care by health care providers (brief advice to quit smoking, related self-help materials, or both). For smoking cessation providers could be divided in two features including, 1) smoking cessation the primary care service system, the smokers were offered smoking cessation smoking system by health care professionals-most of them were nurses who experienced providing smoking cessation service and 2) smoking cessation by telephone couseling, participants in selected studies were delivered smoking cessation service by quitline counselors trained for providing intensive smoking cessation counseling followed by the gold standard of telephone counseling for quitting smoking.

3.5. Comparison arms

This paper reports characteristics of comparison arms with reference to the features of intervention as follows:

3.5.1. Effects of counseling compared with no treatment or wait-listed control

Only one study [20] that intended to investigate the effectiveness, PPA between counseling by delivering the smoking cessation information via SMS text messaging intervention. However, both of the 1-wk PPA and 1-mo PPA were not significantly different among the study participants.

3.5.2. Effects of smoking cessation counseling compared with usual care or minimal intervention

14 studies [6-13, 17, 18, 30, 31] aimed to investigate the effectiveness-measured by PPA between a variety of counseling interventions and usual care or minimal intervention. Four studies [6, 7, 13, 31] using counseling by telephone comparing with control group. Overall, the findings illustrated that the quitline telephone could assist smokers to stop smoking permanently better than usual care-standard advice, standard counseling, the self-help booklet, particularly proactive telephone [31]. Meanwhile, two studies–Ridner et al. [13], and Etter [11] provided motivational interviewing compared with usual care. The findings illustrated that only study of Ridner et al. [13] could enhance smoker to stop smoking rather than the control group. Moreover, web-based for quitting smoking was used to compare between experimental and control group in the studies of Clark, Cox [12], Brendryen and Kraft [8], Stanczyk, de Vries [23], and Skov-Ettrup, Dalum [31]. The findings revealed that only two studies [8, 12] that counseling through web-based or internet devices could help the study participants to quit smoking effectively. The comparison of effects of smoking cessation counseling-measured by PPA compared with usual care or minimal intervention is shown as Fig. 2.

3.6. Outcome measures

The outcome varied widely among the studies, which could be divided into characteristics including abstinence self-report and biological verification. Most studies used self-reported abstinence measures (i.e., 7-day, 30-day abstinence) as the primary outcome abstinence measure, ranging from 1 to 24 months after finishing intervention [6 – 13, 17 – 20, 30, 31]. Moreover, biological verifications were used to measure in some studies, namely expired-air carbon monoxide (CO) [12, 19, 30] and saliva cotinine [18].

4. Conclusion

This study reviewed intervention evaluating the efficacy of previous smoking cessation strategies in primary health care that reviews had not covered. This study assessed the body of evidence based on the strength smoking cessation interventions provided for smokers by healthcare providers. This paper summarizes whether the evidence assembled would change recommendations in previous authoritative publications and guidelines.

5. Discussion and Recommendations

The findings of this study can be compared and contrasted witn the former studies as follows:

Firstly, previous studies indicated that brief individual cessation counseling was efficacious [29]. Moreover, the review of counseling yielded mixed results. This study reports the increased abstinence with counseling treatment.

Secondly, the results are consistent with recent reviews [6, 7, 10, 18] showing that self-help, especially by multimedia or modern technology device has more effect when combined with other methods such as person-to-person intervention or mobile phone quit line.

Finally, telephone counselling–a very crucial tobacco cessation service, using multisession telephone counselling [32, 33] has been the most effective kind of behavioral intervention for smoking cessation service. This is because telephone counselling center has delivered information, advice, support, and referrals to tobacco users-regardless of their economic status, geographic location including the primary healthcare setting. Furthermore, the telephone counselling has been staffed by counselors trained specifically to assist smokers quit, also followed by the gold standard protocol [34]. Moreover, telephone counseling for smoking cessation has usually had not only low cost,

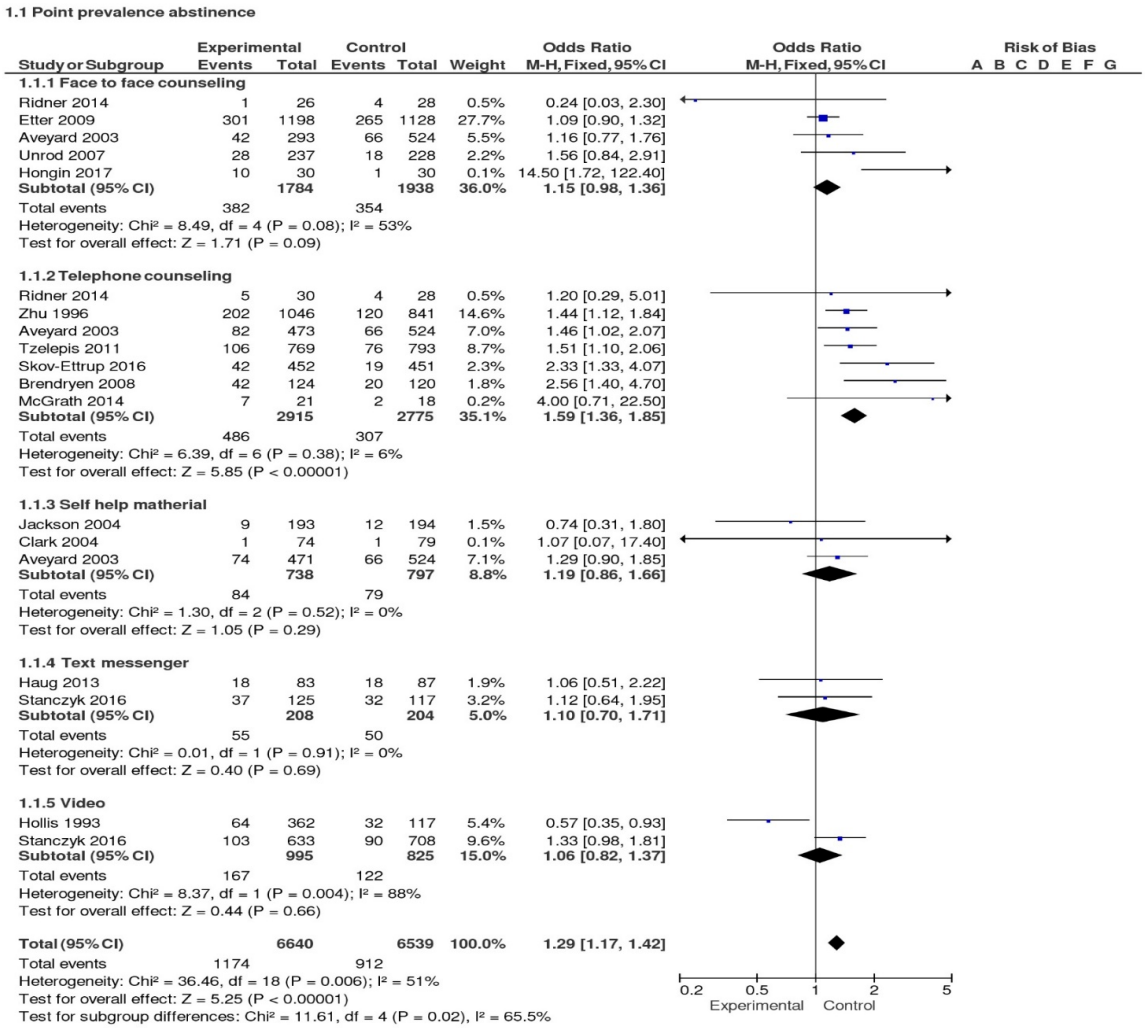

Figure 2: Meta-analysis studies comparing behavioral intervention to usual care or minimal intervention conditions.

but also facilitated smokers in the primary care setting quit conveniently [35]. A good illustration of this is that Quitline for smoking cessation service in New Zealand has promoted health gain, addressed health inequalities among smokers in the primary care setting as well as saved health system costs [36, 37]. However, the telephone counselling service, particularly the Thailand National Quitline (TNQ) should be integrated with other existing smoking cessation services in order to increase the accessibility as well as efficacy of the expected outcome. All thing considered, smoking cessation service system should be provided into primary healthcare service system, also the TNQ should be integrated with other smoking cessation services.

Recommendation for further studies, very few studies explore the effectiveness of an integrated behavioral interventions for smoking cessation using proactive multisession telephone counseling and building capacity the social capitals in the community i.e. Village Health Volunteers (VHVs) or family members because these can help the smoker to stop smoking closely. Especially, community health care service team can facilitate something to assist smoker to quit tobacco use effectively. It is due to of the fact that humans' behaviors, particularly smoking behavior, are caused by complicated factors which include internal and internal factors.

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