EFFECTIVENESS OF EDUCATION BASED STRATEGIES FOR SMOKING CESSATION: A META ANALYSIS

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ABSTRACT

Background: World Health Organization has estimated that tobacco use (smoking and smokeless) is currently responsible for the death of about six million people across the world each year with many of these deaths occurring prematurely. This total includes about 600,000 people are also estimated to die from the effects of second-hand smoke.[1] The provision of educational interventions in combination with systematic outreach practice-based support could be an effective strategy to engage smokers in smoking cessation activities[2]. As the evidence for harmful effects of tobacco use has mounted, epidemiological research has progressed from simply identifying health risks associated with smoking to more detailed studies of the long-term effects of different smoking behaviours on mortality and morbidity.[3]. **Search methods:** Electronic database searches were conducted using the following keywords; smoking cessation education intervention randomized controlled trials.

Studies were included if they were used- (1) randomized or controlled designs, (2) controlled before and after trials designs, and (3) designs that presented objective and (4) interpretable measures of smokers behaviour and smokers quit rates, (5) articles written in the English language. An effect size (ES) was calculated for every outcome measure reported, risk ratio, calculated as: (number of quitters in intervention group/ number randomized to intervention group) / (number of quitters in control group/ number randomized to control group).[4] Meta-analysis is performed using a Mantel-Haenszel fixed-effect method to estimate a pooled risk ratio with 95% confidence intervals.[5] **Results:** A total of 26 trials met the inclusion criteria for comparisons in this review. The study failed to detect evidence that education based strategies was more effective than a similar intensity of non educational format. There was limited evidence that the addition of Education Based interventions (EBIs) to other forms of treatment, such as nicotine replacement, produced extra benefit. **Conclusions:** There is not enough evidence to evaluate whether Education Based interventions (EBIs) are more effective than other non educational intervention. Identifying the most effective and cost-effective education based intervention for different populations of smokers is still an area for research. However Education Based interventions (EBIs) are likely to be effective when used independent of pharmacotherapy.

Keywords: Smoking, Cessation, Education, Intervention Studies, Randomized Controlled Trials, Meta Analysis.

Introduction :

Smoking is increasing especially among the children and young adults. Fink [6] pointed out that a literature review is the effective evaluation of selected documents on a research topic.

Research has shown that smoking is the main cause of differences in death rates in middle age across socio-economic groups.[7] The findings supplement those of a previous review which found that, smokers who had received education in smoking cessation were more likely to perform tasks of smoking cessation.[8] Programmes that were outreach, multi-component and which combined educational and practice-based interventions were found to be most effective. [9]. Strength of evidence from the literature review, regarding the smoking directs us towards the development of interventional strategies. What we do not know, in the area of smoking, is a detailed understanding of attitudes, beliefs, values, and behaviour related to smoking. The study will identify gaps in our knowledge regarding smoking and suggest new directions for future research. The study will benefit smokers and the community as the provision of educational interventions in combination with systematic outreach practice based support for smokers is likely to be an effective strategy to increase smoking quit rates. The available data relative to these issues is inconclusive, and which of these explanations pertain remains to be determined by further research. So this is the important topic which needs to be considered for Meta analysis.

Main objective of this meta-analysis study is to determine the effect of educational based interventions in achieving long-term smoking cessation. The study further aims to test the effectiveness of educational based strategies in the treatment of smoking dependence. Using meta-analytic procedures, the research test the effectiveness of recent controlled trials of educational based strategies in the treatment of smoking dependence.

Materials and Methods:

Criteria for considering studies for this review

Types of studies :

Trials were eligible for inclusion if participants were randomly allocated to treatment groups. Trials of worksite smoking cessation programmes which randomized worksites to different programmes were included. andomized trials were considered that compared educational based interventions with self help, individual counseling, another intervention or no intervention (including usual care or a waiting list control).

Types of participants :

Smokers of either gender irrespective of their initial level of nicotine dependency, recruited from any setting or country.

Types of outcome measures :

The main outcome was abstinence from cigarettes at follow up at least four weeks after the start of treatment. Trials that reported only shorter follow up than four weeks or had no measurement of smoking cessation were excluded. Where patients were lost to follow up they were regarded as being continuing smokers.

Search methods for identification of studies:

Electronic database searches were conducted, and review articles were consulted. A manual search of reference

lists from retrieved publications was also conducted.

Search criteria::

Selection criteria included studies that use randomized or controlled designs, controlled before and after trials designs, and designs that presented objective and interpretable measures of smokers' behaviour and smokers quit rates. "Smoking cessation" was used as a subject descriptor with "education based interventions." Keywords specific to meta analysis will be chosen e.g. "smoking", 'cessation', 'education', 'intervention studies', 'evaluation trials', 'Randomized controlled trials', etc. In each stage the exact keywords used in each individual search and the number of hits/articles found in each one was recorded. The included studies were obtained either via the internet, from our library or ordered.

Electronic searches:

Electronic database searches were conducted using the following keywords; smoking cessation education intervention randomized controlled trials.

Databases searched:

The following databases were searched using the inclusion criteria;

Combined Health Information Database Dissertation Abstracts International Database, ERIC, Occupational Health and Safety Database, Smoking and Health Database, MEDLINE, EMBASE, PsycINFO, CINAHL, Oxford Journals, ADC British Medical Journal (BMJ) and the Cochrane Library. Trials were identified from the Specialized Register of trials held by the Cochrane Tobacco Addiction Group (date searched March 2013).A manual search of reference lists from retrieved publications was also conducted. In addition, the literature search was also carried out, using above mentioned keywords from these well-known Journals namely CINAHL, Oxford Journals, ADC British Medical Journal (BMJ) and the Cochrane Library.

Searching other resources:

Many articles were hand searched for above keywords, according to inclusion/ exclusion criteria.

Fifty relevant articles were obtained from the search strategy. Out of these only 26 studies met inclusion criteria, so remaining studies were excluded from the review process. So finally 26 studies were selected for the Meta analysis. The details of search and relevant studies obtained from each database are summarized below.

Table-1: Search Criteria and Search Results

Search Term Criteria	Limitation for search	Source	Results (Articles found)	Relevant Results
Smoking Cessation Education	Full text subscriptions	MEDLINE	904	4
		EMBASE	901	3
		PsycoINFO	485	1
		BMJ Journals	182	2
		Smoking & Health Database	1716	5
Smoking, Education, Randomized controlled trials'	Smoking & education in Title/ Abstract & Randomized controlled trials' anywhere in article.	MEDLINE	36	6
		EMBASE	30	5
		PsycoINFO	07	---
		BMJ Journals	72	7
		Smoking & Health Database	188	10
Smoking, Cessation, Randomized controlled trials	Randomized controlled trials in Title/Abstract and smoking cessation anywhere in article.	MEDLINE	401	5
		EMBASE	359	--
		PsycoINFO	170	--
		BMJ Journals	2922	7
		Smoking & Health Database	1161	10
Smoking education intervention studies'	Full text, PDF file, English language, peer reviewed	MEDLINE	40	8
		EMBASE	45	--
		PsycoINFO	18	--
		BMJ Journals	441	--
		Smoking & Health Database	04	--

For the literature search advanced search option was used. This search was carried out from four renowned databases such as CINAHL, MEDLINE, Smoking and Health Database and British Medical Journal (BMJ) in March 2013. Many articles were found common among the databases. Other articles were searched on Google as a supportive study.

The main search terms used for literature search are 'smoking', 'cessation', 'education' and 'randomized controlled trials'.

Data collection and analysis

Selection of studies

Inclusion criteria: Studies were included if they were used (i) a study of smoking cessation (ii) randomized or controlled designs, (iii) controlled before and after trials designs, and (iv) designs that presented objective and (v) interpretable measures of smokers behaviour and smokers quit rates, (vi)

articles written in the English language, The literature in the searches was carefully examined and included or excluded based on inclusion/exclusion criteria.

Sampling strategy

Selecting papers for coding:

Titles and abstracts provided the basis for initial decisions and selection of documents. The set of documents were scanned for inclusion/exclusion criteria met by the titles and/or abstracts. On the basis of relevance contained in the title or abstracts, a group of 109 full text reports

that would be considered for coding. Then decision made on whether a paper met the inclusion criteria. Initially, 33 published articles were judged to meet the coding criteria, but after further consideration, six papers were excluded. One paper was excluded because it reported data that were already reported in one of the included papers. Two other papers employed workplace randomized designs and were excluded because they reported outcomes in the form of prevalence rates and not individual level Quit Rates.

Coding variables

Design variables: The coding variables based on study design included random or non-random assignment, unit of randomization (subject or worksite), unit of analysis (subject or worksite), attrition, lost at follow up, biochemical verification, length of follow up, and pre-test group comparison.

Sample descriptors: The coding descriptors included education, smoking rate (cigarettes/day), smoking prevalence, and previous quit attempts.

Intervention descriptors: These are included intervention type (self help, physician advice, incentives, cessation group and other), treatment duration (fixed time or intermittent).

Effect size data: These variables included control group; treatment group; smoking cessation for four weeks, six months, 12 months, and/or more than 12 months; 30 day point prevalence, or continuous abstinence.

Data extraction and validity assessment:

The study is assessed for its validity and trustworthiness of individual studies. The papers were identified from the searches on the basis of titles and The following comparisons are made:

abstracts. The data extraction followed the same procedures as one of the reviews on the Cochrane collaboration.[10] The papers were coded individually. The quality of the research designs was ensured by the design and methodological inclusion criteria. An assessment was made of whether or not multi-level analyses were used in the individual trials where the unit of allocation was at the level of the smokers.[11] The data was extracted using different statistical methods considering any biases along with studies conforming to the study's inclusion criteria. The principal outcome was cessation rates.

Data Analysis

Trials which met the screening criteria of having educational based interventions arm and sufficient length of follow up were identified by Literature Search. Allocation of treatment arms to one or more comparison groups and data extraction was carried out. If a trial had both a comparable programme with educational related intervention and a waiting list or minimal intervention control both were included in the appropriate comparisons. If two different education based intervention were compared with another method or a control, the education based interventions were combined in the comparison of group versus non-educational methods.

In studies comparing alternative delivery formats of more than one intervention, each was treated as a separate trial and entered separately into the meta-analysis.

Comparison 1. Educational based interventions (EBIs) vs other format of interventions:

1.1 Educational based interventions (EBIs) versus self-help programmes

1.1.1 Educational based interventions (EBIs) versus the same self help programme alone

1.1.2 Educational based interventions (EBIs) versus a different self help Programme

1.2 Educational based interventions (EBIs) plus NRT versus NRT alone

1.3 Educational based interventions (EBIs) versus pharmacy based intervention

1.4 Educational based interventions (EBIs) versus physical activity counselling

1.5 Educational based interventions (EBIs) versus no intervention (including usual care, minimal contact or a waiting list control)

Comparison 2. Comparisons between different Educational based interventions [Outcome Long term cessation for all comparisons]:

2.1-2.5 Comparisons between different Educational based programmes for smoking cessation

Statistical analysis: The 26 controlled trials in this review may be considered a "best evidence" subset of the literature on the topic and, as such, are well suited to meta-analytic procedures. Each of the studies was cast into a short term (four week or six month Quit Rate), intermediate term (12 month Quit Rate), or long term (more than 12 months Quit Rate) frequency based on the count of smokers and quitters in

treatment and control conditions at each assessment point. The number of quitters and the total number of participants were recorded in Review Manager 5, which is the Cochrane Collaboration's software for meta-analysis.

An effect size (ES) was calculated for every outcome measure reported, risk ratio, calculated as: (number of quitters in intervention group/ number randomized to intervention group) / (number of quitters in control group/ number randomized to control group). Meta-analysis is performed using a Mantel-Haenszel fixed-effect method to estimate a pooled risk ratio with 95% confidence intervals.[5].

Ethical issues: Ethical approval was taken in all the studies chosen in this review from their respective Ethics Committees. Informed consent procedure was maintained by all studies. Out of 26 studies some studies maintained an anonymity and confidentiality of the participants by using pseudonym of participants and keeping paper work secret. [12, 13]

Assessment of risk of bias in included studies : Biases in meta analysis may be introduced if the identification, inclusion and assessment of primary studies are not systematic because of publication related biases.[14] In this meta analysis methodological quality of these articles was appraised in terms of strength of evidence like appropriateness of research design with research question, appropriateness of data collection methods, data analysis and discussion.

Measures of treatment effect: An effect size (ES) was calculated for every outcome measure reported, risk ratio, calculated as: (number of quitters in intervention group/

number randomized to intervention group) / (number of quitters in control group/ number randomized to control group). Meta-analysis is performed using a Mantel-Haenszel fixed-effect method to estimate a pooled risk ratio with 95% confidence intervals.[5] The amount of statistical heterogeneity between trials was estimated using the I^2 statistic.[15] Values over 50% can be regarded as moderate heterogeneity and values over 75% as high. Heterogeneity was calculated using the Q statistic, which is distributed as a c2 with n-1 degrees of freedom where n, is the number of effect sizes.[16]

Dealing with missing data: In using an intention to treat analysis it is assumed that participants who can not be reached for follow up or who decline further participation are all still smoking.

Assessment of heterogeneity: Heterogeneity is commonly observed in meta-analyses of smoking cessation outcomes.[17] In this review, Statistical tests were performed to investigate for heterogeneity. According to Hedges and Olkin[16], Forest plots are the most frequently used graphic method to present the summary results of meta-analyses. For each study, the effect estimate and respective confidence interval, as well as the pooled effect estimates with their confidence intervals, are plotted on a single dimension. The variability between estimates on the plot highlights the heterogeneity of trials.

Assessment of reporting biases: The most appropriate way of handling the reporting bias is to perform sensitivity analyses with regard to the different possible entry criteria.[18] In addition to such sensitivity analyses, the likely presence or absence of bias was examined graphically in funnel plots which estimates the trails' effect against their sample size - are useful

to detect bias in meta-analysis.[17] In the absence of bias, the plot should thus resemble a symmetrical inverted funnel. If the plot shows an asymmetrical and skewed shape, bias may be present.

Sensitivity analysis: Sensitivity analyses were performed on studies having self help, NRT and no intervention controls, which showed no alteration of final conclusion. Sensitivity analysis including only the studies rated adequate for allocation concealment gave a larger estimated effect, as it seems unlikely that there would have been a high risk of systematic bias from this design. Excluding studies with an inadequate method of allocation concealment did not alter the conclusions from this meta-analysis. Numbers randomized were used in primary analysis, but a sensitivity analysis was conducted of the effect of using numbers followed up as the denominator.

Results:

A total of 26 studies are included in the review. Some of these compared Education Based Interventions (EBIs) with more than one alternative and were used in each relevant comparison group. The other studies did not have a non-education based control and contribute only to comparisons between different education-based programmes. Most studies recruited community volunteers prepared to participate in educational programmes. Seven studies recruited in primary care settings.[12,19,20,21,22,23,24] One study recruited participants with a diagnosed cardio-vascular health problem.[25]

The studies are grouped under following comparisons:

1. **Comparisons between Education Based Interventions (EBIs) and non-education based controls**

1.1 Comparison of education based and self-help programmes: Six studies compared an education based programme with self help programmes. one study; Lawerence *et al.*[23]] compared both, same and different content self help materials with educational programme. So this study is included in both set of comparisons.[23]

1.2 Comparison of education based intervention plus NRT to NRT alone: Four studies compared NRT in addition to education based intervention. The control group consisted of only NRTs.

1.3 Educational based interventions vs. Pharmacy based intervention: The trial briefly noted here was mostly small and did not show significant long-term effects on cessation, although it had wide confidence interval.1785 participants were involved in that study.

1.4 Educational Based Interventions (EBIs) vs. physical activity counseling: In these studies, all participants attended six weekly treatment sessions and follow-ups two weeks after the final treatment (six weeks after quitting) and 12 mths after quitting. There was no contact with participants between the follow-ups at six weeks and 12 months after the quit day. At each treatment session the exercise group received approximately 5 min of cognitive–behavioural physical activity counseling; incorporating decision balance sheets, goal-setting, relapse prevention planning and self-monitoring. The controls received heath education advice; for a comparable time as for the physical activity counseling.

1.5. Comparison of Education Based Interventions (EBIs) with 'no

intervention' controls: Six trials included control groups were considered to have little or no specific content to encourage cessation. Hill *et al.*[26] used an exercise programme as a placebo control condition.

2.   Comparisons between different educations based programmes:

Details in this comparison tested a range of different components for enhancing abstinence as part of education based programmes. A group of trials are also considered which specifically addressed mood management.

Risk of bias in included studies

The study evaluated four domains of study quality; randomization sequence generation; sequence concealment, blinding during treatment and follow up; and incomplete outcome data. The details of methodological quality of each study are displayed below in Figures-1 and

2.   Methodological quality graph and summary:

Allocation: Most of the studies reported the method for generating the randomization sequence in sufficient detail to be classified as having a low risk of bias, but only seven studies described a method of allocation likely to ensure that the assignment was concealed until after allocation.[19, 20, 24, 27, 28, 29] In other trials no allocation concealment was described. As it seems unlikely that there would have been a high risk of systematic bias from this design, sensitivity analysis was performed.

Blinding: There was little information about blinding. The intervention was mostly provided by hospital staff or health professional, so there are possibilities of

bias because of inadequate blinding. Biochemical validation of self-reported non-smoking was attempted for all those categorized as quitters in four studies.[20, 21, 24, 30] Most studies reported the number of participants who dropped out or were lost to follow up, and included these people as continuing smokers. In most cases the percentage lost was small and similar across groups.

Incomplete outcome data: Some reports give quit rates based only on those people contacted at follow up. In this review the methods of the Cochrane Tobacco Addiction review group[31] have been followed in reporting analyses based on the total number randomized, with drop-outs and participants lost to follow up classified as smokers wherever possible.

Figure-1: Methodological quality graph: Review of each methodological quality item presented as percentages across all included studies.
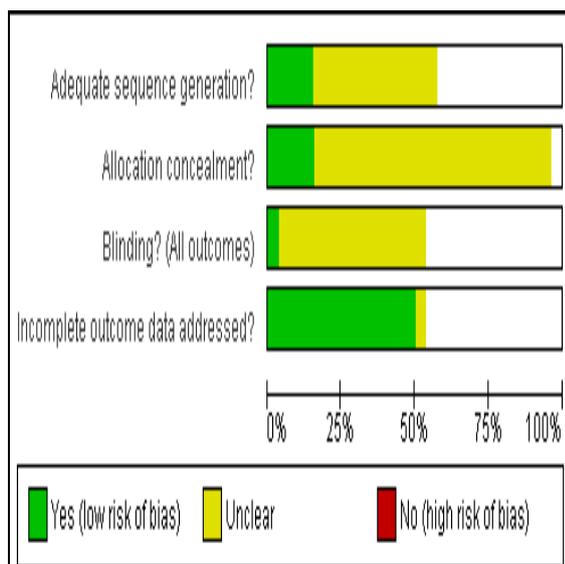
Effects of interventions

The effects of Education Based Interventions (EBIs) are described below. The Education Based Interventions (EBIs) have following effects:

1. **Comparisons between Education Based Interventions (EBIs) and other format of interventions:**

1.1 Comparison of Education Based Interventions (EBIs) and self-help programmes:
This comparison included more than 5079 participants from six studies. Final results could not show the significant difference of effectiveness between Education Based Interventions (EBIs) and self-help programmes.

1.2. Comparison of Education based interventions plus NRT with NRT alone:
Four trials with 1640 participants evaluated the effect of adding an educational support programme to NRT and NRT alone. The studies shows no significant benefit is achieved by adding education based strategies to nicotine replacement therapy for smoking cessation.

1.3. Educational based interventions vs. Pharmacy based intervention:
The trial did not show significant effects on cessation. Bauld *et al.* [29] failed to show evidence that educational based programme designed for smokers had a greater benefit than pharmacy based intervention.

Figure- 2: Methodological quality summary: Review of each methodological quality item for each included study.

1.4. Educational based interventions vs. physical activity counseling: The trial briefly noted here was mostly small and did not show significant long-term effects on cessation, although it had wide confidence interval. Ussher *et al.*[12] failed to show evidence that educational based programme designed for smokers had a greater benefit than physical activity counseling.

1.5. Educational based interventions compared to 'No Intervention' controls: Six trials with over 4970 participants contributed. Six trials had higher quit rates with education based programmes compared to a no-intervention or a minimal contact control.

2. Comparisons between different formats of education based programme

2.1 Skills Training/ Cognitive-Behavioural components: Two studies compared educational format programes that differed in their use of specific components such as skills training or cognitive- behavioural therapies[19,32]. From the two studies no significant benefit is found on smoking cessation.

2.2. Mood Management components: Two trials tested specific interventions to help manage mood [28,33]. So from the two trials, it is found that managing mood has no significant effect on smoking cessation.

2.3. Physician advice vs. Active programmes : There was evidence from the five trials with 2197 participants [19,25,27,34,35] that there was an effect of physician or nurse advice on smoking cessation as compared to other active programmes. So physician advice favours smoking cessation as compared to active programme.

2.4. Weekly support vs Basic support: Aveyard *et al.* [20] could show evidence that a programme designed for smokers had a greater benefit than a standard intervention. Aveyard *et al* [20] showed significant long-term effects on cessation where a slightly more intensive planned intervention had a lower quit rate.

2.5 Isometric exercises: Prasad *et al.*[36] detected a difference in quit rates using isometric exercises in their emphasis on abstinence or controlled smoking. CO confirmed abstinence, nicotine with drawal symptoms, urges to smoke, and use of the techniques to resist urges were recorded weekly for four weeks after the quit day.

Data Analyses : All data and analyses are displayed in following tables:

Table -2: Comparison1: Smoking cessation. Education Based Interventions (EBIs) vs. other format of intervention

Outcome or Subgroup	Studies	Participants	Statistical Method	Effect Estimate
1.1 Smoking cessation. Education Based Interventions (EBIs) vs. self help programme	6	5079	Risk Ratio (M-H, Fixed, 95% CI)	1.20 [1.01, 1.43]
1.1.1 Education based interventions vs. self help programme (same intervention content)	5	3479	Risk Ratio (M-H, Fixed, 95% CI)	1.25 [1.00, 1.56]
1.1.2 Education Based Interventions (EBIs) vs. Self help programme (different intervention content)	2	1600	Risk Ratio (M-H, Fixed, 95% CI)	1.14 [0.86, 1.49]
1.2 Smoking cessation. Education Based Interventions (EBIs) plus NRT vs. NRT alone	4	1640	Risk Ratio (M-H, Fixed, 95% CI)	1.14 [0.92, 1.43]
1.3 Smoking cessation. Education Based Interventions (EBIs) vs. Pharmacy based intervention	1	1785	Risk Ratio (M-H, Fixed, 95% CI)	1.91 [1.61, 2.27]
1.4 Smoking cessation. Education Based Interventions (EBIs) vs. Physical activity counseling	1	299	Risk Ratio (M-H, Fixed, 95% CI)	1.37 [0.71, 2.64]
1.5 Smoking cessation. Education Based Interventions (EBIs) vs. No intervention controls	6	4970	Risk Ratio (M-H, Fixed, 95% CI)	1.28 [1.12, 1.47]

Table-3: Comparison 2. Comparisons between different types of Educational Based Interventions (EBIs) [Outcome smoking cessation for all comparisons]

Outcome or Subgroup	Studies	Participants	Statistical Method	Effect Estimate
2.1 Skills training	2	258	Risk Ratio (M-H, Fixed,95% CI)	1.22 [0.71, 2.12]
2.2 Mood management	2	725	Risk Ratio (M-H, Fixed, 95% CI)	1.03 [0.74, 1.44]
2.3 Physician advice vs. Active programme	5	2197	Risk Ratio (M-H, Fixed, 95% CI)	0.73 [0.58, 0.91]
2.4 Weekly support vs. Basic support	1	925	Risk Ratio (M-H, Fixed, 95% CI)	0.86 [0.54, 1.37]
2.5 Isometric exercises	1	40	Risk Ratio (M-H, Fixed, 95% CI)	0.82 [0.44, 1.53]

Discussion:

There is no consistent evidence that education based strategies increases the likelihood of cessation compared to less intensive support. In this review, Education Based Interventions (EBIs) are defined as those providing structured approaches to smoking cessation. There is no obvious equivalent for the drug placebo to control for the non-specific effects of a treatment method [37].

The results indicated that EBIs can effectively decrease rates of smoking. More rigid measures such as totally smoke-free workplaces may yield better effects on smoking behaviours, as has been reported in previous studies [38]. The setting in our present study is not restricted to any country or places. The study evaluated the effectiveness of education based strategies including designation of smoking places, and price rises in tobacco that world has experienced in recent years, comparing them to health education in a limited specific setting. The study found that Educational Based Interventions (EBIs) are fairly effective on smoking cessation rates as compared to certain format of intervention.

Summary of main results

Using an education based format for intervention ought to allow more people to be treated by a therapist, and therefore could be more cost-effective if outcomes are similar, but there is not enough evidence about comparative efficacy.

Two trials that examined group educational based therapy as an adjunct to nicotine replacement therapy failed to detect a significantly increased quit rate for combined therapy over NRT alone. In both studies the comparison arm had some educational based support - two meetings and materials in the case of Ginsberg *et al.*[39], and eight weekly assessment sessions in the case of Jorenby *et al.*[30]. Once again the evidence is too limited to draw substantial conclusions. In the absence of clear evidence it is assumed that educational based interventions & pharma-cotherapies independently contribute to successful quitting. Comparison of educational based therapy with a control group offered no intervention supports the conclusion that educational based programmes can aid smoking cessation, but heterogeneity precludes estimating the size of effect, and it does not provide

evidence for a specific benefit from the Education Based Intervention (EBIs).The results of the meta-analysis provide no evidence that providing education based intervention rather than self-help materials alone can increase long-term quit rates. There is no indication that education based programmes are more likely to improve quit rates compared to structured self-help programmes when they are used alongside other components such as mass media or worksite initiatives.

Limitations of the study

Some limitations to this study are acknowledged.

(1)   First, this analysis included only studies published in English. Although the possibility that small differences in components cannot be excluded, and in the therapists' training or skills, have an effect on the outcome, it is not possible to detect such differences in the meta-analysis. There may be variation by the group in which they were treated, due to aspects of the group process.

(2)   There may be possibility of publication bias. It is possible that there are other published or unpublished studies have been not located.

(3)   A caveat in interpreting the results of the meta-analysis is the potential upward bias of the mean effect size due to sampling bias [40]. The weighted mean effect sizes were heterogeneous and caution should be taken in using them as an adequate description of the overall effects of the identified studies.

Conclusions:

There is evidence that education based strategies including advice from a healthcare provider are better than any active programmes, and other less intensive interventions, in helping people stop smoking, although they may be no better than nicotine replacement therapy (NRT) alone. Education Based Interventions (EBIs) may also be valuable as part of a comprehensive intervention which includes nicotine replacement therapy (NRT). Providers need to make a judgement about the cost effectiveness of the gains achieved by Education Based Interventions (EBIs) compared to other interventions [41].

This review examined the specific effect of materials which aimed to provide a structured approach to smoking cessation beyond simple information. There is increasing evidence that materials that are tailored for individual smokers are more effective than active intervention[42,43,44], and more effective than non-tailored materials, although the absolute increase in quit rates is still small[45,46,47]. Local discussion of research evidence is important in getting research into practice.

The overall results of the meta analysis concludes that physician or nurse advice, isometric exercises and weekly support favours smoking quit rates.

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