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Use of social marketing to address the global burden of disease: Initiatives and effects

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Abstract

Purpose: To assess the use of social marketing interventions to address public health concerns and provide evidence on the effectiveness of the approach as a preventive tool in public health programming.

Method: A scoping review framework was used, and articles published between 2000 and 2015 were included. Social marketing interventions were defined as interventions meeting at least six of the eight National Social Marketing Benchmark criteria adapted by French and Blair-Stevens (2006).

Results: Sixty-nine (69) social marketing studies were included in the study. Nutrition, physical health and obesity (24.6%), malaria (20.3%), HIV/AIDS (11.6%), and cancer (10.0%) were the most prominent public health topics where social marketing strategies were employed.

On the effectiveness of using social marketing in public health results indicated that the use of electronic medical records (EMR) among medical students increased from 13.8% to 54.7% while alcohol-impaired driving decreased from 85.0% to 65.0%, and child's sugar-sweetened beverages intake reduced from 82.2% to 68.8%.

The protective effect of ITN use to prevent malaria yielded OR=0.46 (95% CI: 0.30, 0.71, p=0.236).

Limitations: The lack of high-quality data from the evaluation of social marketing interventions poses a major challenge and this needs to be addressed.

Originality/value: Though the social marketing framework has gained widespread use in addressing and preventing some public health crises, the use of the framework seems limited to certain health topics, such as malaria and physical activities, nutrition, and obesity.

Keywords: Social Marketing; Global Burden of Disease; Public Health; Scoping Review.

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1. Introduction

The acceptance of and use of social marketing in influencing behaviors for the greater social good has continued to grow since the early 1970s when it was first introduced. There are two dedicated journals, at least six regional associations, and one global association dedicated to the advancement of social marketing practice, research, and teaching (The International Social Marketing Association, 2018). The social marketing framework, which is used to design programs that influence the voluntary behavior of target audiences to improve personal welfare and that of society, has been successfully and widely applied in many public health interventions. For instance, it has been used to address challenges concerning safe drinking water in Madagascar, the promotion of mosquito nets in Nigeria, to alcohol consumption in Australia and many other countries around the globe (Bryant., 2005); (Suggs, 2013); (Domegan, 2012); (Suggs, 2011). Many reviews have also been conducted to synthesize credible information from the evaluation of social marketing interventions focused on the influence of social marketing on individuals and policy-level changes.

Reviews have been focused mainly on alcohol, tobacco, illicit drugs, malaria, and physical activity to the exclusion of the full range of diseases of public health concerns (Gordon, *et al.*, 2006). Consequently, reviews on the application of social marketing framework to address diseases such as ischemic heart disease, diarrhea, HIV/AIDS, lower respiratory infections, maternal and child health as well as tuberculosis are sparse and the breadth of coverage of social marketing or its effects in this regard is yet to be fully ascertained (Gordon, *et al*., 2006) (Evans, 2006) (Firestone, 2014). The limitations arising from these reviews are due mainly to a lack of adequate information on the search strategy and inclusion criteria, coupled with the fact that the methods have not always been systematic and the reviews have conceptualized social marketing in widely differing ways (Gordon, *et al*., 2006).

The global burden of the disease consists of mainly diseases caused by human behavior that can be changed, and that social marketing can influence. The diseases and health-related behaviors that are currently placing the highest burden on health systems and communities include respiratory infections, malaria, diarrhea, maternal and child health, HIV/AIDS, STDs/STIs, nutrition, violence against women, road traffic crashes, cancer, obesity, heart disease, lung disease, diabetes, tobacco use, physical activity, and mental health (WHO, 2014) (GHM, 2015). Therefore, this study aimed to understand the evidence base of both the use of and effectiveness of the social marketing framework in addressing public health topics of global concern, defined by WHO statistics (WHO, 2014) for the global burden of disease and estimates from Global Health Metrics (GHM, 2015). The aim is to understand the breadth of health topics and then the effectiveness of interventions.

2. Methodology

This study adopted the scoping studies framework proposed by Arksey and O'Malley, (2005). The approach of a scoping study was chosen over a systematic review because one of its key strengths is that it can provide a rigorous and transparent method for mapping areas of research in a relatively short space of time compared with a full systematic review. It also provides the opportunity for the explicit illustration of the field of interest in terms of the volume, nature, and characteristics of the primary research (Arksey, 2005). Though it has the limitation of producing a large quantity of data, which may be problematic to handle appropriately, it presents the opportunity to achieve maximum coverage and depth as well as a succinct descriptive account of available research (Arksey, 2005). The analysis of these data makes it possible to identify gaps in the evidence base as well as summarize appropriate research findings. The scoping studies framework has five components with an optional component of 'Consultation'. In this study, the optional component was omitted, however, a data summary was undertaken using meta-analysis to provide evidence synthesis which is usually not a part of the scoping studies framework. This was done to fully address the research question in the study and to provide evidence to estimate the effectiveness of using the social marketing approach as a tool for addressing public health issues of global concern.

2.1. The stages of the methodological framework for the study consisted of:

- Stage 1: Identifying the research questions
- Stage 2: Identifying relevant studies
- Stage 3: Selection of articles
- Stage 4: Charting the data and
- Stage 5: Collating, summarizing, and reporting the data

The study was thus implemented using the scoping study framework as described below:

2.1.1. Identifying the research question

The starting point was the identification of the research question to be addressed in this study. Before a literature search, the following questions were developed to be addressed in the study. The study thus identified and then addressed the following research questions:

- What is the distribution of social marketing interventions on public health issues?
- What is the effect of the use of social marketing initiatives on public health topics of global concern?

2.1.2. Identifying relevant studies

Four databases were searched; PubMed, MEDLINE, PsycINFO, and CINAHL. The following key terms were used for the search: social marketing, respiratory infections, malaria, diarrhea, maternal and child health, HIV/AIDS, STDs/STIs, nutrition, violence against women, road traffic crashes, cancer, obesity, heart disease, lung disease, diabetes, tobacco use, physical activity, and mental health. The public health topics or risk factors included in the key terms were defined as important public health issues of global concern based on WHO (2014) statistics (WHO, 2014) for the global burden of disease and estimates from Global Health Metrics (GHM, 2015). The search strategy used the word "and" to connect the key terms. The inclusion criteria for accepting articles into the scoping review process were:

- The articles were peer-reviewed
- The articles were published during the years 2000 to 2015
- The articles were not systematic reviews
- The term social marketing was in the title or abstract of the article.
- The article presented some evidence (qualitative or quantitative) of health or behavior outcomes after exposure to social marketing intervention.
- The article was written in the English language

2.1.3. Charting the data

Data were extracted from eligible articles using a standard form that was created in MS Excel. The data extraction included the author's name, year of publication, country of origin, study population, study design, and length of intervention of the social marketing initiative as well as the impact or effectiveness of the social marketing initiative on target audiences.

Of the 13 social marketing articles evaluated with RCT study designs, 6 reported data on the effectiveness of using social marketing interventions, 4 studies had no quantitative data, and 3 did not compare control and intervention groups before and after the social marketing interventions Table 2. Of the 6 studies, only study one reported data that was used in the meta-analysis, while the rest reported only outcomes and could not be synthesized using meta-analysis. Data management, analysis and reporting.

The data extracted from the 69 articles was managed in MS Excel. The analysis of the data obtained from social marketing articles was performed to estimate the distribution of the use of social marketing initiatives in public health topics.

To assess the effectiveness of social marketing interventions, evidence reported by primary articles was presented. In addition, a pairwise meta-analysis of the study data on public health topics was performed based on the null hypothesis of no effect for implementing social marketing interventions. The study tested the null hypothesis (Ho) of no difference in audience behavior/health outcome after exposure to social marketing interventions in selected public health topics of global concern; Ho: P-Po=0.

Where, Po and Pare the proportions of those reporting health or behavior outcomes before and after the social marketing intervention respectively (or μ-$\mu 0$ =0, mean health outcomes before and after social marketing intervention).

This analysis was performed using the free R software. The pairwise DerSimonian and Laird random-effects model was fitted to allow for the variability between studies. The test of funnel plot asymmetry was also performed to further assess the validity of the meta-analysis by checking the specific effect of publication bias on the analysis. This was paramount because the results of meta-analysis could be misleading in the presence of huge publication bias and many other biases that may be introduced in the process of locating, selecting, and combining studies (Eggar, 1998) (Iain K Crombie and Huw To Davies, 2009). The likelihood of heterogeneity was assessed using the I2 statistics. The report of I2 >50% was considered representative of important statistical heterogeneity in the study data.

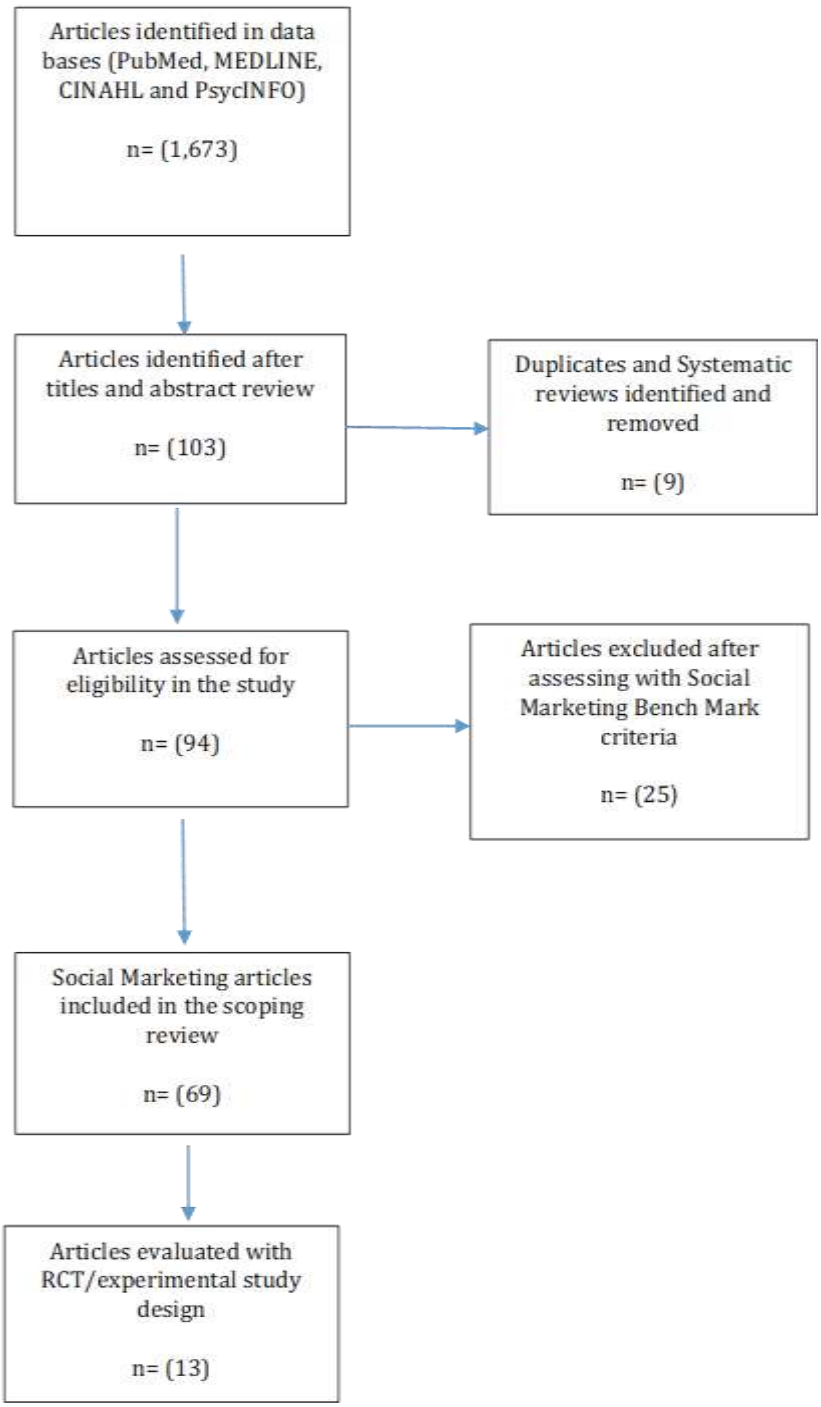

Figure 1 The Flow diagram of articles obtained from literature search

3. Results

3.1. Distribution of social marketing approaches for public health interventions

The study assessed the use of social marketing interventions to address global public health issues. The percentage distribution of public health topics per social marketing interventions found in the study is shown in Figure 2. Results indicate that nutrition, physical health, and obesity (24.6%), malaria (20.3%), HIV/AIDS (11.6%), and cancer (10.0%) were the most prominent public health topics where social marketing strategies were employed. Less than 5% of social marketing interventions were utilized to address each of the following public health issues; diarrhea, mental health, tobacco use, reproductive health/family planning, diabetes, heart health, violence against women, asthma, road crashes, and alcohol consumption.

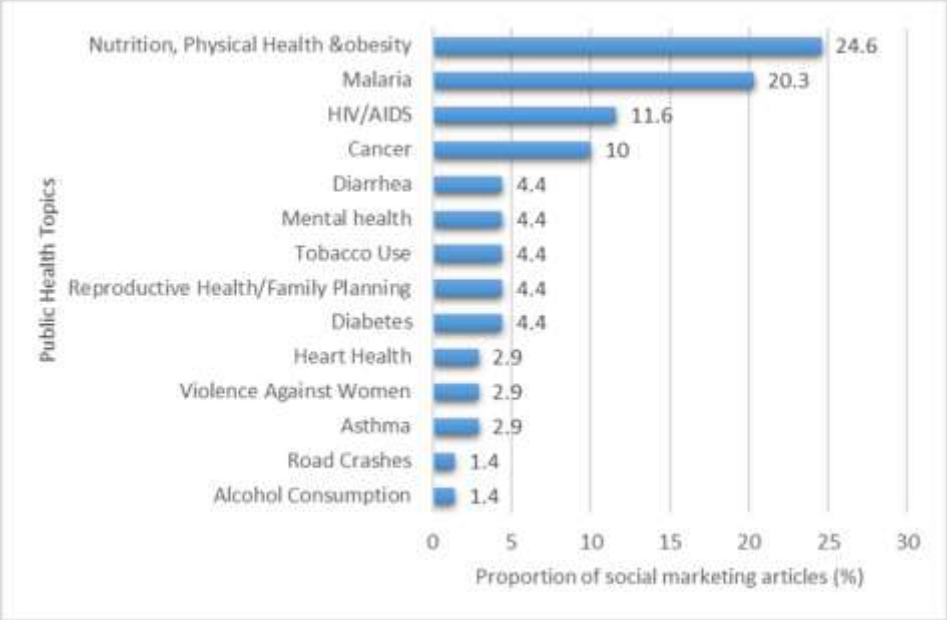

Figure 2 Percentage distribution of Public Health Topics by Social Marketing Interventions.

3.2. Effectiveness of using social marketing approaches in addressing public health topics

The effectiveness of social marketing approaches to address public health concerns was assessed in this study using data from interventions evaluated using an RCT study design. Of the 6 RCT articles identified in this study, one was on diabetes, one on nutrition and physical activity, one on asthma care with two outcome variables, and one on road crashes. In addition, three of the RCT articles were on malaria. One article had one arm, another had two arms, and the third had four arms (i.e. representing different intervention periods).

3.3. Findings from identified RCT studies

A total of 6 articles reported data on social marketing interventions evaluated with RCT study design. Table 3 present the RCT articles and the percentage change in each outcome variable assessed after each social marketing intervention. The development and piloting of a low-literacy diabetes education book using social marketing techniques to improve diabetes care reported a marginal improvement of 1.15% after the intervention. While, use of electronic medical record (EMR) among medical students increased from 13.8% to 54.7% after a social marketing intervention. Similarly, Insecticides Treated Nets (ITN) use improved among target groups from 5.4% to 13.3% in Zambia and from 16.0% to 28.0% in Burkina-Faso after social marketing interventions to promote the use of bed nets. Additionally, it was also reported the road crashes due to alcohol-impaired driving decreased from 85.0% to 65.0%, while child's sugar sweetened beverages intake reduced from 82.2% to 68.8% with the use of social marketing.

Table 1 Effectiveness of using social marketing interventions on identified public health topics.

S/N	RCT Articles	Public Health Topic	Outcome variable	Effectiveness of SMK intervention	
				Before/ Control	After/Intervention
1.	Development and Pilot of a Low-Literacy Diabetes Education Book Using Social Marketing Techniques	Diabetes	Diabetes care	6.80%	8.05%
2.	Social Marketing and Student Documentation of Asthma Care: A Quasi-Randomized Controlled Trial	Asthma care	Use of EMR by Medical Students	13.80%	54.70%

3.	Reducing alcohol-impaired driving crashes through the use of social marketing	Road Crashes	Alcohol impaired driving crashes	85.00%	65.00%
4.	The impact of a hybrid social marketing intervention on inequities in access, ownership and use of insecticide-treated nets	Malaria	ITN use	5.40%	13.30%
5.	Distribution Systems of Insecticide-Treated Bed Nets for Malaria Control in Rural Burkina Faso: Cluster-Randomized Controlled Trial	Malaria	ITN use	16.00%	28.00%
6.	Effects of an intervention aimed at reducing the intake of sugar-sweetened beverages in primary school children: a controlled trial	Nutrition and physical activity	Child's sugar sweetened beverages intake	82.20%	68.80%

Further review of the articles revealed that the article by Olaf *et al*, 2008 presented additional data which allowed further analysis to be performed, while the other 5 articles did not present such data. Thus, meta-analysis using data from only RCT evaluated intervention could only be performed with data reported by the 4 arms Cluster-Randomized Controlled Trial on the use of ITN. The findings from this analysis is presented in the next section.

3.4. Findings from RCT study on ITN use to prevent malaria

The results from the meta-analysis of data on the use of ITN among heads of households, women and children is presented in the forest plot in Figure 3. The random effects model to estimate the protective effect of ITN use among these target groups to prevent malaria yielded OR=0.46 (95% CI: 0.30, 0.71, p=0.236). This indicated that those who used ITNs among these target groups were 46.0% protected against malaria relative to those who did not use ITN, though the difference was not statistically significant. The value of I^2 =29.3% suggested the presence of small statistical heterogeneity in the meta-analysis however, sub-group analysis could not be performed due to paucity of data.

The funnel plot which is a scatterplot of Standard Error against Effect Size/Odds Ratio was used to assess publication bias in the meta-analysis. The plot in Figure 4 which shows the random effects model, appears asymmetrical revealing the presence of publication or other biases in the meta-analysis.

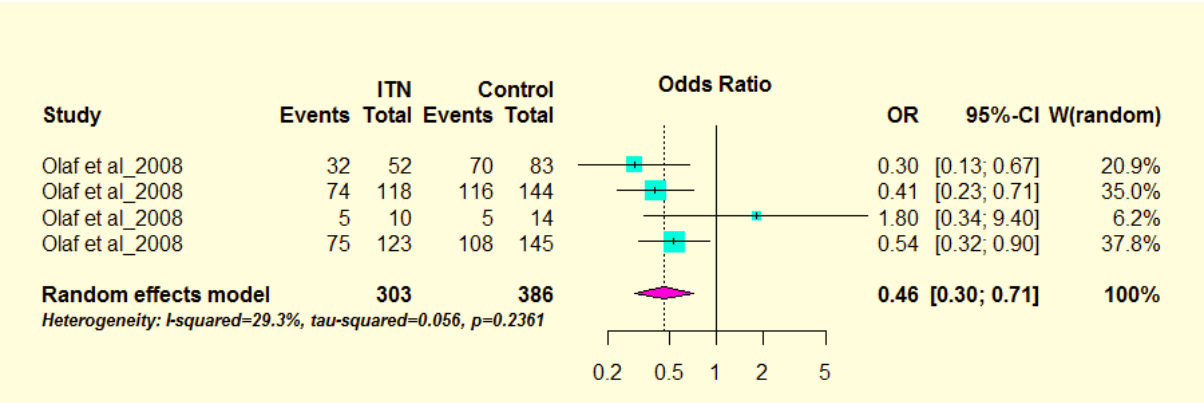

Figure 3 Forest plot showing the impact of ITN to prevent malaria among Heads of Households, women and children from RCT data

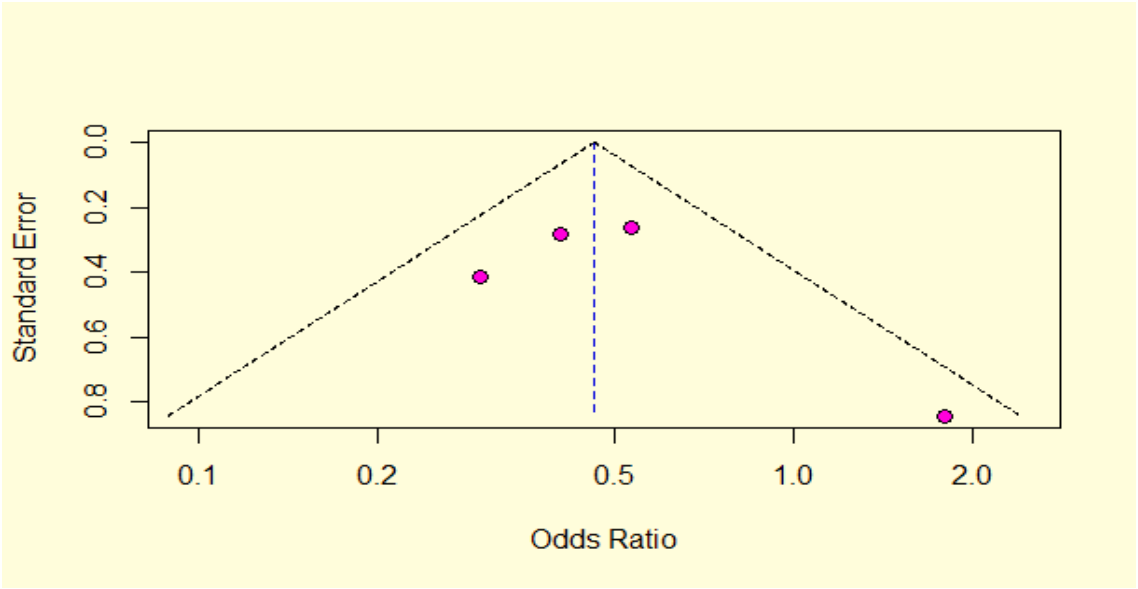

Figure 4 Funnel plot to visualize the presence (or absence) of bias among the studies on ITN

3.5. Findings from RCT and Non-RCT studies on ITN use to prevent malaria

To further expand the above analysis, data from two non-RCT studies were combined with the data from the previous RCT study on ITN use and results from the meta-analysis of the data is presented in the forest plot in Figure 5. The random effects model to estimate the protective effect of ITN use among target groups to prevent malaria yielded OR=0.51 (95% CI: 0.36, 0.72, p=0.0009). This indicated that those who used ITNs among these target groups were 51.0% protected against malaria relative to those who did not use ITN. Suggesting a statistically significant difference between those who reported the use of ITN compared to those who did not use ITN in the studies. So, the null hypothesis of no difference was then rejected at $p<0.05$. This was not the case in the previous analysis due to very limited available data. However, the value of I^2 =73.5% suggested the presence of very large statistical heterogeneity in the meta-analysis. Sub-group analysis could also not be performed in this case due to paucity of data.

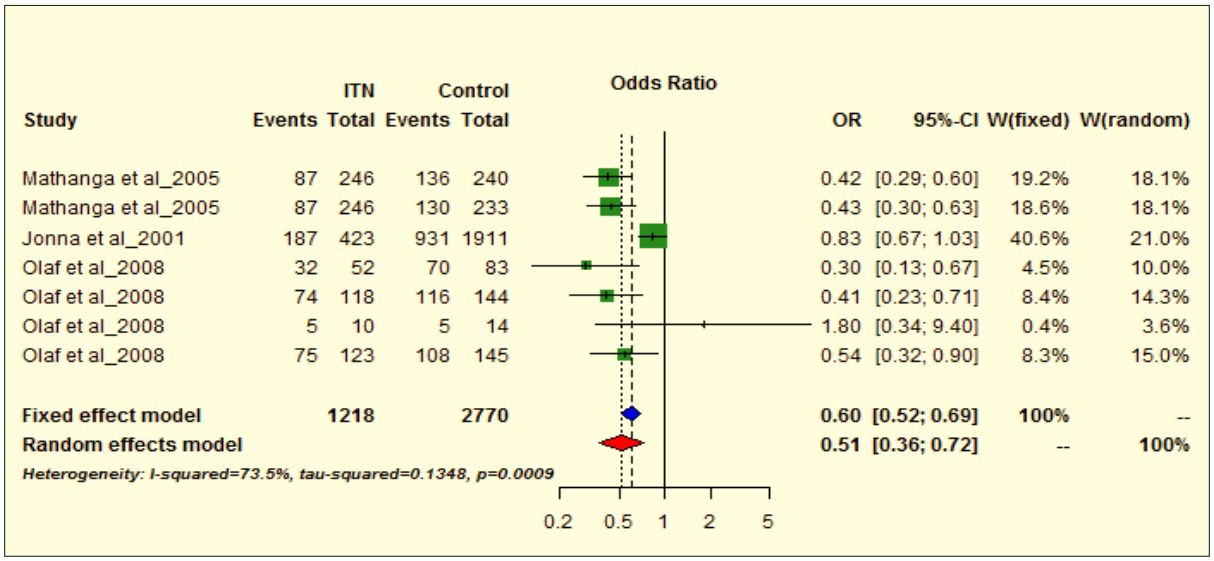

Figure 5 Forest plot showing the impact of ITN to prevent malaria among Heads of Households, women and children

Furthermore, the plot in Figure 5 that shows the fixed (blue) and random effects (red) models appears skewed and asymmetrical, revealing the presence of publication or other biases in the meta-analysis. In addition, a data point was spotted just outside the funnel, which indicated that one of the studies that was included in the meta-analysis reported results that were not statistically significant.

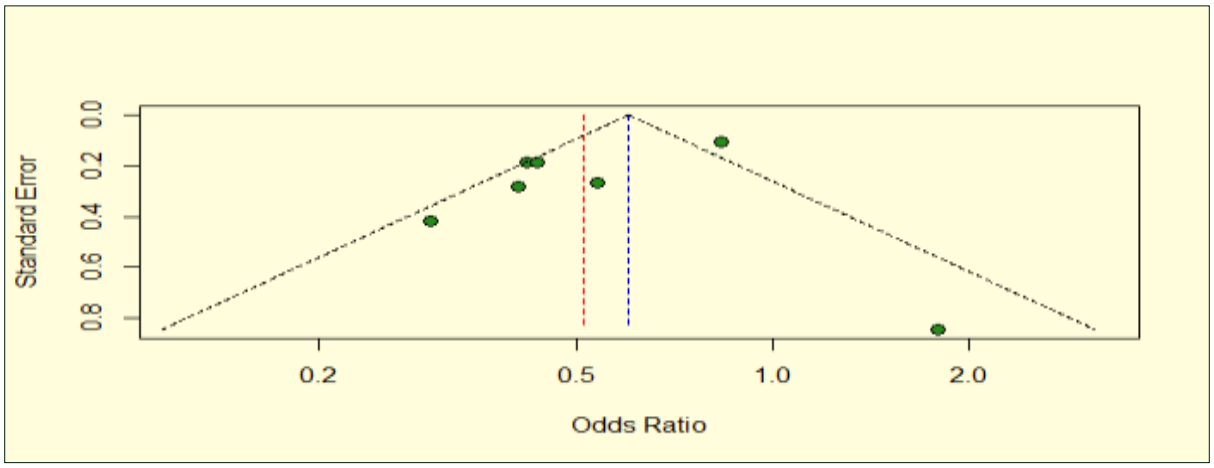

Figure 6 Funnel plot to visualize the presence (or absence) of bias among the studies on ITN use.

4. Discussion

The use of social marketing and its effectiveness were assessed in this study. Results suggest that social marketing interventions were applied mostly to address nutrition, physical activity, and obesity, as well as malaria, HIV/AIDS, and cancer while the framework was sparsely used to address other public health issues of global concern. The lowest use of social marketing was in heart health, violence against women, asthma, road crashes, and alcohol consumption. The use of social marketing as a preventive tool in the prevention and control of most diseases is rapidly increasing among health and social marketing professionals and the need for clear guidance of this tool is highly desirable to achieve the desired standards. For instance, most of the social marketing interventions included in the study were not evaluated with the use of rigorous experimental study methods such as RCTs. In addition, this signifies a gap in the availability of reliable data to support the effectiveness of the social marketing framework in addressing some of the most important global health problems. However, the data extracted from available RCT and non-RCT articles on malaria in this study appear to show some promise of the effectiveness of using social marketing approaches as a preventive tool to address public health issues. Furthermore, the presence of large statistical heterogeneity in the study as observed in the meta-analysis has the potential to void the validity of the study.

In addition, the analysis performed to assess bias also suggested the presence of publication or other biases in the study. This could be due to the paucity as well as the low quality of data obtained from the scoping review this does not invalidate the conclusions arrived at in this study due to the scientific rigor employed to conduct this study rather caution should be observed when interpreting the results of this study.

The study demonstrated the utility and some measure of effectiveness in the use of social marketing intervention as a preventive tool via behavior change. For instance, the study demonstrated behavior change in increased use of bed nets, increased use of EMR by medical students, improved diabetes care, reduced child intake of sugar-sweetened beverages to control obesity, and reduced alcohol-impaired driving to prevent road crashes after a social marketing intervention. Some data were available to estimate the effect of the behavior change on health outcomes as was done for malaria prevention. Though it was reported that the proportion of medical students using ERM templates for clinical documentation increased in the study, data were not available to estimate the effect of the change in behavior on better health outcome from asthma care. However, the results obtained to support the effectiveness of the use of ITN to protect against malaria among those who used ITN appears credible and consistent with earlier results obtained by PSI (PSI, 2012). Suggesting that evidence synthesis from properly designed and rigorous studies could help to provide much needed data to demonstrate the effectiveness of social marketing programs targeted at prevention without necessarily implementing elaborate studies from the scratch. This could help health managers to deploy scarce resources more appropriately to social marketing prevention programs or programs that may be showing promise of better health outcomes.

The use of rigorous methods such as RCT for the evaluation of social marketing intervention is highly recommended, as this will provide the platform for the credible assessment of the effectiveness of such interventions to address key public health topics as it is done for drugs and other health treatment technologies. The current practice of using or relying mainly on cross-sectional or qualitative studies to provide some evidence for success in assessing the effectiveness of using social marketing interventions may no longer be sufficient as the science of social marketing continues to evolve

into the future as a major tool for addressing public health challenges. This is particularly a welcome idea for health professionals in middle and low-income countries where resources are scarce and dwindling rapidly. Standard procedures should be developed to guide researchers in the conduct of such rigorous studies so, that the results can easily be moved beyond primary research to the realm of evidence synthesis.

4.1. Challenges, limitations and weaknesses, lessons

The availability of social marketing interventions which were evaluated with the use of RCT study design were sparse and of poor quality. Attempts were made to assess the quality of these articles with the use of Jadad quality score (Jadad AR, 1996). The outcome of the assessment revealed that, though some authors discussed the randomization procedures in the social marketing studies, none of the studies reported double blinding methods in the studies, and none gave reasons for the withdrawals or dropouts of study participants in the groups described as recommended by Jadad et al (1996). The low number and poor quality of social marketing publications using RCTs portends a major gap in the evaluation of social marketing interventions in addressing public health initiatives.

Furthermore, the outcome variables for most interventions were unclear and difficult to identify. It would thus be important to use clearly defined and agreed-upon indicators to evaluate the primary and secondary outcomes of social marketing interventions as this science continues to evolve into a viable scientific tool for addressing public health challenges. It is therefore recommended that globally acceptable and easily measurable behavior outcome indicators should be defined and agreed upon for all public health topics of global concern. Biological or physiological markers were difficult to measure in the study and were also too few for analysis. Thus, it is also recommended that behavior determinants resulting from social marketing interventions should be assessed together with health outcomes in the evaluation of social marketing interventions.

5. Conclusion

The social marketing framework has gained widespread use in addressing and preventing public health challenges across many countries. However, its adoption seems limited largely to topics such as nutrition, physical activities and obesity as well as malaria, HIV/AIDS and cancer. The results obtained from the meta-analysis conducted in this study suggest that there is untapped potential in the use of social marketing to address the global burden of disease and high-quality evaluations are needed. Social marketing has clear potential to addressing other public health topics, which could help to reduce the burden of diseases through preventive methods in many underserved regions where resources are scarce and disease burden is high.

Compliance with ethical standards

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Disclosure of conflict of interest

The authors declare no conflicts of interest.

Authors Contribution

All authors contributed equally to the review's conception, design, and manuscript preparation.

Data Availability

All data used in this review are publicly available and properly cited.

Statement of Ethical Approval

Our review only included published studies that had already obtained necessary ethical approvals and followed ethical guidelines. No primary data collection or human subject involvement was required, and therefore, ethical approval was not necessary.

Statement of Informed Consent

Informed consent was not applicable, as our review only included published data.

Adherence to Guidelines

This review adheres to the PRISMA guidelines for systematic reviews and meta-analyses.

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