USING THE DELPHI TECHNIQUE TO DEVELOP EFFECTIVENESS INDICATORS FOR SOCIAL MARKETING COMMUNICATION TO REDUCE HEALTH-RISK BEHAVIORS AMONG YOUTH

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Abstract. This study aimed to develop effectiveness indicators for social marketing communication to reduce health-risk behaviors among Thai youth by using the Delphi technique. The Delphi technique is a research approach used to gain consensus through a series of two or more rounds of questionnaire surveys where information and results are fed back to panel members between each round and it has been extensively used to generate many indicators relevant to health behaviors. The Delphi technique was conducted in 3 rounds by consulting a panel of 15 experts in the field of social marketing communication for public health campaigns in Thailand. We found forty-nine effectiveness indicators in eight core components reached consensus. These components were: 1) attitude about health-risk behavior reduction, 2) subjective norms, 3) perceived behavioral control, 4) intention to reduce health-risk behaviors, 5) practices for reducing health-risk behaviors, 6) knowledge about the dangers and impact of health-risk behaviors, 7) campaign brand equity, and 8) communication networks. These effectiveness indicators could be applied by health promotion organizations for evaluating the effectiveness of social marketing communication to effectively reduce health-risk behaviors among youth.

Keywords: Delphi technique, effectiveness indicator, marketing communication, health risk behavior, youth

INTRODUCTION

Health-risk behaviors among youth (15-24 years old) have become a major public health concern in Thailand over the past few decades. National studies (National Statistical Office, 2011; 2013) show a significant increase in health-risk behaviors among Thais aged 15-24 years. These behaviors included unintentional injuries, tobacco use, alcohol use, drug use, risky sexual behavior, inappropriate diet, and physical inactivity. Several health promotion organizations in Thailand have launched various approaches to reduce these health-risk behavior in this population. One approach is using social marketing communication campaigns to reduce these undesirable health behav-

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iors. Social marketing is the use of marketing principles and techniques to create, communicate, and deliver products that influence target audience behaviors to benefit society (*eg*, public health, safety, the environment, and the community) along with the target audience (Kotler and Lee, 2008). This approach has been widely used for public health interventions in some countries (Grier and Bryant, 2005). In Thailand, there is empiric evidence showing the advantage of social marketing communication campaigns on health behavior such as malaria prevention (Chaotanont *et al*, 2007), filariasis drug treatment (Ratmanee *et al*, 2006; Koyadun *et al*, 2007), prevention and control of bird flu and other types of influenza (Chantarasugree, 2010), dengue hemorrhagic fever prevention (Thavornwattanayong, and Intharakul, 2011), stroke prevention (Tumakul and Sota, 2011), and health promotion among disc jockeys (Iftikhal and Sota, 2012). Despite this data, some social marketing communication practitioners in public health in Thailand have an incomplete understanding of outcomes. This tends to come from a lack of effectiveness indicators for social marketing communication. Therefore, this study aimed to develop effectiveness indicators for social marketing communication to reduce health-risk behaviors among youth by using the Delphi technique, a structured process commonly used to develop effectiveness indicators (Mabotja, 2013). This will help social marketing communication practitioners plan and evaluate social marketing campaigns for public health more effectively.

Overview of the Delphi technique in generating indicators

The Delphi technique was originally developed in the 1950s by the RAND Corporation in Santa Monica, California during the Cold War when the US devised the "Delphi Project" to forecast the impact of technology on the development of military capabilities (Mabotja, 2013; Cuhls, 2014). It is a research approach used to gain consensus through a series of two or more rounds of questionnaire surveys where information and results are fed back to panel members between each round (Barzekar *et al*, 2011). Since the 1970s, the Delphi technique has been used extensively in various fields, such as public policy making, public administration, economics, business, environmental management, education, communication, and public health (Rowe and Wright, 1999; Villiers *et al*, 2005; Hsu and Standford, 2007). In public health, the Delphi technique has been used to seek consensus among health expert panels and for generating indicators relevant to health behaviors (Barzekar *et al*, 2011). Four key features are regarded as necessary for defining a procedure as a "Delphi". These are anonymity, iteration, controlled feedback, and the statistical aggregation of a group response (Rowe and Wright, 1999). Anonymity of panel participants must be guaranteed (Rowe and Wright, 1999). Since there is no physical meeting, this method avoids the revealing identity and buffer personality characteristics of some participants dominating others. It allows participants to express their opinions, encourages open critique, and minimizes the impact of personal biases. Repetition of the questionnaire over a number of rounds gives individuals the opportunity to change their opinion without fear of losing face in the eyes of others in the group. A facilitator summarizes individual contributions and allows participants to revise their responses. Participants get an opportunity to comment on their own responses, those of others,

and the process of the panel as a whole. At any time, participants can revise their earlier responses or comments (Mabotja, 2013). At the end of the polling, the group judgment is taken as the statistical average [means/medians/interquartile rank (IQR)] of the participants' responses.

The Delphi method usually uses two or three rounds involving 10-15 expert participants. The first round of the Delphi technique is unstructured allowing the participants to identify the key issues and the scope of those issues. The second round is more structured, having participants answer using a quantitative format, usually a 5-point Likert scale. After this round, the responses are analyzed and statistically summarized [usually into means, medians, and interquartile rank (IQR)], and then presented to the participants for further consideration. From this point onward, participants are given the opportunity to alter their prior assessments based on the majority opinion without loss of face. For participants whose answers fall outside the majority opinion, they are asked to give reasons why they answered the way they did. This procedure is continued until stability in responses is achieved (Rowe and Wright, 1999). The Delphi method is a credible research tool for exploring consensus. We used the Delphi technique in this study to determine effectiveness indicators for social marketing communication campaigns for public health issues.

MATERIALS AND METHODS

The researcher reviewed information about effectiveness indicators for social marketing communication campaigns to reduce health-risk behaviors among youth, using a wide range of sources, including academic research articles from peer-reviewed journals listed in both national and international databases, current textbooks, and theses/dissertations about social marketing communication. After reviewing the literature, the findings were summarized into 47 effectiveness indicators comprising 8 core components (Nowak *et al*, 1998; Guttman, 2000; Rossem and Meekers, 2000; Evan *et al*, 2002; Moore *et al*, 2002; Winsor *et al*, 2004; Evan *et al*, 2005; Grier and Bryant, 2005; Shive and Morris, 2006; Johnson *et al*, 2007; Stead *et al*, 2007; Evan and Hastings, 2008; Evan *et al,* 2008; Keller and Lehmann, 2008; Kotler and Lee, 2008; Price *et al*, 2009; Hawkins and Mothersbaugh, 2010; UNODC, 2010; Valente, 2010; Evan, 2011). These 8 components were attitude towards health-risk behavior reduction, subjective norms, perceived behavioral control, intention to reduce health-risk behaviors, practices for reducing health-risk behaviors, knowledge about dangers and impact of health-risk behaviors, campaign brand equity, and communication networks. Second, before beginning the Delphi process, the researcher identified criteria to form a panel of experts in social marketing communication who were both academics and practitioners. The criterion used was experience working in social marketing communication or a related field for at least 5 years. Fifteen experts were chosen for this study since one study found 10 to 15 experts was best to yield satisfactory results (Suwaratchai *et al*, 2008).

During the first round of the Delphi process, a formal letter and a questionnaire were sent to each participant. The first round questionnaire was open-ended asking about potential effectiveness indicators derived from reviewing the literature. Each expert was asked to agree or disagree with each indicator. If

Table 1
List of components and indicators.

8 Components	49 Indicators
Attitudes about health-risk behavior reduction	Attitude about unintentional injuries reduction.
	Attitude about tobacco use reduction.
	Attitude about alcohol use reduction.
	Attitude about drug use reduction.
	Attitude about sexual-risk behavior reduction.
	Attitude about inappropriate dietary behaviors reduction.
	Attitude about physical inactivity reduction.
Subjective norms	Family norms.
	Friend norms.
	Senior norms.
	Celebrity norms.
	Lecturer norms.
	Media norms.
Perceived behavioral control	Perceived behavioral control over unintentional injuries.
	Perceived behavioral control over tobacco use.
	Perceived behavioral control over alcohol use.
	Perceived behavioral control over drug use.
	Perceived behavioral control over sexual-risk behaviors.
	Perceived behavioral control over inappropriate diet.
	Perceived behavioral control over physical inactivity.
Intention to reduce health-risk behaviors	Intention to reduce unintentional injuries.
	Intention to reduce tobacco use.
	Intention to reduce alcohol use.
	Intention to reduce drug use.
	Intention to reduce sexual-risk behaviors.
	Intention to change inappropriate diet.
	Intention to reduce physical inactivity.
	Intention to reduce unintentional injuries.
	Intention to reduce tobacco use.
Practices for reducing health-risk behaviors	Practices for reducing unintentional injuries.
	Practices for reducing tobacco use.
	Practices for reducing alcohol use.
	Practices for reducing drug use.
	Practices for reducing sexual-risk behaviors.
	Practices for changing inappropriate diet.
	Practices for reducing physical inactivity.
Knowledge about dangers and impact of health-risk behaviors	Knowledge about dangers and impact of unintentional injuries.
	Knowledge about dangers and impact of tobacco use.
	Knowledge about dangers and impact of alcohol use.
	Knowledge about dangers and impact of drug use.
	Knowledge about dangers and impact of sexual-risk behaviors.
	Knowledge about dangers and impact of inappropriate diet.
	Knowledge about dangers and impact of physical inactivity.
Campaign brand equity	Campaign loyalty.
	Perceived campaign quality.
	Campaign associations.
	Campaign awareness.
Communication networks	Size of communication networks.
	Frequency of communication.
	Number of media used in communication.
	Intention to disseminate information over networks.

Table 2
Results of rating indicators in second round.

Components and indicators	Consensus				
	Mean	Median	Inter quartile rank (Q3-Q1)	Median - Mode	Status
Attitude about health-risk behavior reduction					
Attitude about unintentional injuries reduction.	4.60	5.00	1.00	0.00	✔
Attitude about tobacco use reduction.	4.87	5.00	0.00	0.00	✔
Attitude about alcohol use reduction.	4.67	5.00	0.00	0.00	✔
Attitude about drug use reduction.	4.67	5.00	1.00	0.00	✔
Attitude about sexual-risk behavior reduction.	4.67	5.00	1.00	0.00	✔
Attitude about inappropriate dietary behaviors reduction.	4.67	5.00	1.00	0.00	✔
Attitude about physical inactivity reduction.	4.67	5.00	1.00	0.00	✔
Subjective norms					
Family norms.	4.87	5.00	0.00	0.00	✔
Friend norms.	4.87	5.00	0.00	0.00	✔
Senior norms.	4.60	5.00	1.00	0.00	✔
Celebrity norms.	4.73	5.00	1.00	0.00	✔
Lecturer norms.	4.53	5.00	1.00	0.00	✔
Media norms.	4.87	5.00	0.00	0.00	✔
Perceived behavioral control					
Perceived behavioral control over unintentional injuries.	4.73	5.00	1.00	0.00	✔
Perceived behavioral control over tobacco use.	4.80	5.00	0.00	0.00	✔
Perceived behavioral control over alcohol use.	4.87	5.00	0.00	0.00	✔
Perceived behavioral control over drug use.	4.67	5.00	1.00	0.00	✔
Perceived behavioral control over sexual-risk behaviors.	4.67	5.00	1.00	0.00	✔
Perceived behavioral control over inappropriate diet.	4.67	5.00	1.00	0.00	✔
Perceived behavioral control over physical inactivity.	4.60	5.00	1.00	0.00	✔
Intention to reduce health-risk behaviors					
Intention to reduce unintentional injuries.	4.73	5.00	0.00	0.00	✔
Intention to reduce tobacco use.	4.93	5.00	0.00	0.00	✔
Intention to reduce alcohol use.	4.93	5.00	0.00	0.00	✔
Intention to reduce drug use.	4.73	5.00	0.00	0.00	✔
Intention to reduce sexual-risk behaviors.	4.73	5.00	0.00	0.00	✔
Intention to change inappropriate diet.	4.87	5.00	0.00	0.00	✔
Intention to reduce physical inactivity.	4.87	5.00	0.00	0.00	✔
Practices for reducing health-risk behaviors					
Practices for reducing unintentional injuries.	4.67	5.00	1.00	0.00	✔
Practices for reducing tobacco use.	4.93	5.00	0.00	0.00	✔
Practices for reducing alcohol use.	4.93	5.00	0.00	0.00	✔
Practices for reducing drug use.	4.73	5.00	0.00	0.00	✔
Practices for reducing sexual-risk behaviors.	4.73	5.00	0.00	0.00	✔
Practices for changing inappropriate diet.	4.80	5.00	0.00	0.00	✔
Practices for reducing physical inactivity.	4.80	5.00	0.00	0.00	✔

Table 2 (Continued).

Components and Indicators	Consensus				
	Mean	Median	Inter Quartile - Rank (Q3-Q1)	Median - Mode	Status
Knowledge about dangers and impact of health-risk behaviors					
Knowledge about dangers and impact of unintentional injuries.	4.67	5.00	1.00	0.00	✔
Knowledge about dangers and impact of tobacco use.	4.87	5.00	0.00	0.00	✔
Knowledge about dangers and impact of alcohol use.	4.87	5.00	0.00	0.00	✔
Knowledge about dangers and impact of drug use.	4.67	5.00	1.00	0.00	✔
Knowledge about dangers and impact of sexual-risk behaviors.	4.67	5.00	1.00	0.00	✔
Knowledge about dangers and impact of inappropriate diet.	4.73	5.00	1.00	0.00	✔
Knowledge about dangers and impact of physical inactivity.	4.73	5.00	1.00	0.00	✔
Campaign brand equity					
Campaign loyalty.	4.40	4.00	1.00	0.00	✔
Perceived campaign quality.	4.73	5.00	1.00	0.00	✔
Campaign associations.	4.60	5.00	1.00	0.00	✔
Campaign awareness.	4.80	5.00	0.00	0.00	✔
Communication networks					
Size of communication networks.	4.53	5.00	1.00	0.00	✔
Frequency of communication.	4.67	5.00	1.00	0.00	✔
Number of media used in communication.	4.67	5.00	1.00	0.00	✔
Intention to disseminate information over networks.	4.40	5.00	1.00	0.00	✔

✔ = Accepted; ✘ = Rejected.

they disagreed, they were asked why. The returned questionnaire were then summarized and tabulated into a second questionnaire. The second questionnaire was then distributed to participants and they were asked to indicate the degree to which they agreed with the indicator using a 5-point Likert scale, with 1 meaning the idea was highly irrelevant and 5 meaning the idea was highly relevant. The goal of the second round and subsequent rounds was to achieve a consensus in responses. After a consensus (stability) was achieved, the Delphi procedure was considered completed (Murry and Hammors, 1995). Variables considered relevant or effective were those which met 4 criteria: 1) the mean score on the Likert scale was >3.51, 2) the median on the Likert scale was >3.50, 3) the absolute value of the difference between the median and the mode was <1.00, and 4) the interquartile rank was <1.50 (Dalkey and Helmer, 1963; Rowe and Wright, 1999; Barzekar *et al*, 2011).

RESULTS

After the first round, two indicators (lecturer norms and media norms) were added at the suggestion of the respondents. A total of 49 indicators comprising 8 core components were included in the final evaluation (Table 1). The results of second round of the questionnaire are shown in Table 2. All 49 indicators and 8 core components met the 4 inclusion criteria stated above. The process was conducted a third round to allow par-

ticipants to change their responses but the respondents did not; therefore, stability was achieved. These components included 1) attitude about health-risk behavior reduction, 2) subjective norms, 3) perceived behavioral control, 4) intention to reduce health-risk behaviors, 5) practices for reducing health-risk behaviors, 6) knowledge about dangers and impact of health-risk behaviors, 7) campaign brand equity, and 8) communication networks.

DISCUSSION

This study aimed to develop effectiveness indicators for social marketing communication to reduce health-risk behaviors among Thai youth utilizing the Delphi technique. A three-round Delphi technique was conducted with a panel of 15 experts in the field of social marketing communication. Forty-nine effectiveness indicators comprising eight core components were agreed upon by the participants, consistent with the literature (Nowak *et al*, 1998; Guttman, 2000; Rossem and Meekers, 2000; Evan *et al*, 2002; Moore *et al*, 2002; Winsor *et al*, 2004; Evan *et al*, 2005; Grier and Bryant, 2005; Shive and Morris, 2006; Johnson *et al*, 2007; Stead *et al*, 2007; Evan and Hasting, 2008; Evan *et al*, 2008; Keller and Lehmann, 2008; Kotler and Lee, 2008; Price *et al*, 2009; Hawkins and Mothersbaugh, 2010; UNODC, 2010; Valente, 2010; Evan, 2011). This study had limitations. First, we used only the Delphi technique, a tool designed for qualitative research. This may have reduced the generalizability of the findings. Our findings need to be validated by quantitative research and analyzed statistically using second-order confirmatory factor analysis. This will make these indicators more generalizable. A second limitation was the anonymity of the par-

ticipants using the Delphi technique. Participants may have interpreted indicators differently. However, we provided clear explanations for each indicator to reduce the likelihood of this. The main strength of this study was to generate effectiveness indicators to be used for health promotion to reduce health-risk behaviors among youth. Whether these can translate into behavioral change in the target group also requires further study.

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