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ORIGINAL ARTICLE

Revised Version of Knowledge, Attitude and Practice of Medical Doctors on Smoking Cessation Guidelines Questionnaire

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Abstract

Number of active smokers in Malaysia is increasing despite availability of stop smoking clinics and smoking cessation medications. Thus, the practice of the healthcare professionals involved in providing smoking cessation intervention using evidence-based guidelines needs to be assessed using validated assessment tool. Newly invented reliable and valid questionnaire locally is needed. This study aimed to develop and validate a newly modified questionnaire to assess the knowledge, attitude and practice of medical doctors based on national smoking cessation guidelines and factors contributing to the score. The 22 items consists of true/false questions and Likert scaling response based on domain of 5A's (ask, assess, advice, assist, arrange) and 5R's (relevant, risks, rewards, roadblocks, repetitions) of the national stop-smoking guideline. Sample size is calculated based on five respondents to one item ratio. The questionnaires were distributed to 131 primary care doctors. Reliability was determined using Cronbach's alpha for internal consistency while construct validity was assessed using factor analysis. A high degree of internal consistency was observed (Cronbach's alpha = 0.87), with good knowledge subscale (0.72), attitude subscale (0.58) and practice subscale (0.92). Factor analysis showed three meaningful finalized components (knowledge, attitude and practice) which represent the smoking cessation framework. This study indicates that this revised questionnaire is more reliable and valid tool to assess the knowledge, attitude and practice on stop smoking guidelines compared to previous questionnaire.

Keywords: Questionnaire, Reliability, Smoking, Validity

Introduction

The questionnaire is the main instrument and tool for collecting data and input in survey research (Shalihin & Mohamad, 2019). It consists of a set of standardized questions and structured items, which follow a fixed scheme in relation to certain domains and topics (Roopa & Rani, 2012) A

good questionnaire must be valid and reliable to answer the survey objectives and questions (Rahman, 2015; Shalihin & Mohamad, 2019). Smoking cessation has been an important issue for the past decades considering the negative consequences of smoking towards health in which behaviour modification is really useful to prevent the related diseases (Shalihin & Mohamad, 2019; Stanton & David, 2018).

Despite increasing health promotion and program by Malaysian Government and other non-profit health organization, the prevalence of active smokers is still remaining high if the statistical data includes any form of smoking such as vaping and electronic cigarette in the statistic (Mira et al., 2017; Shalihin & Mohamad, 2019). In Malaysia, there are abundant smoking cessation programs and quit smoking clinic launched in government and private healthcare centre, however the active clients are really small in number (Zainal et al., 2017; Shalihin & Mohamad, 2019). Other than studying on the predictors of the successful quit smokers, the quality of services provided by the health care personnel also need to be audited and assessed. One of the assessment tool is through the usage of validated questionnaire to assess the knowledge, attitude and practice of the providers on the smoking cessation guidelines used in dealing with active smoking clients (Shalihin et al., 2018; Shalihin & Mohamad, 2019).

Previous questionnaire available worldwide has been invented to assess the efficiency and capabilities of healthcare providers in smoking cessation counselling. However, most of the questionnaires lack in the main domains of 5A's (ask, assess, advice, assist, arrange) and 5R's (relevant, risks, rewards, roadblocks, repetitions) smoking cessation framework which is available in the local and international smoking cessation guidelines (Malaysia & Physician, 2017, Panel, 2008). These components are important in initiating stop smoking among smokers and maintaining their abstinence. It is delivered not only by the physician or medical officer, but by any supporting staff and medical personnel. It is found to be useful in daily busy outpatient clinic setting or even in inpatient counselling (Malaysia & Physician, 2017, Panel, 2008, Shalihin & Mohamad, 2019). This 5A's components consist of 'ask', 'advice', 'assess', 'assist' and 'arrange' components which are useful on encountering any new patients. While, the 5R's components consist of 'relevant', 'risks', 'rewards', 'roadblocks' and 'repetitions' components. This 5R's framework is especially beneficial in convincing the unmotivated smoker to stop smoking (Malaysia & Physician, 2017, Panel, 2008, Shalihin & Mohamad, 2019).

A recent newly developed 17 items questionnaire on knowledge, attitude and practice of medical doctors on smoking cessation guidelines have limited items in the domains of knowledge and attitude despite good overall Cronbach's alpha score (Shalihin et al., 2018). Therefore, this research was focused to modify the items to include more items in the knowledge and attitude domain in order to produce a better questionnaire for assessing the competency of doctors in helping patients to quit smoking. Items number range minimally from five items with Likert scale choice of answers are indeed reasonable and easy to be filled in by respondents with regards to domains that they represents (Kylie et al., 2018).

Materials and Methods

Questionnaire Redevelopment

The new items for each domain of the revised questionnaire were done through literature review and discussion with smoking cessation experts and family medicine specialists. Five main domains identified in knowledge, attitude, practice, 5As and 5Rs of smoking cessation guideline frameworks. Previous initial questionnaire developed by Shalihin et al. in 2018 consist of 17 items with four significant domains but lack in items for knowledge and attitude domains.

The 22 new items were later reproduced and consists of:
a) True / false choice statements;
b) Strongly agree / agree / don't know / disagree / and strongly disagree questions;
c) Always / frequent / seldom / never response

All these items were created based on the domain of 5A's (ask, assess, advice, assist, arrange) and 5R's (relevant, risks, rewards, roadblocks, repetitions) of the national stop smoking guideline (Malaysia & Physician, 2017; Panel, 2008; Shalihin & Mohamad, 2019). This questionnaire uses English language as medium as it is a widely used language among doctors in Malaysia. Since our target population is medical doctors, Malay translation is not required. Demographic data were identified based on literature review and discussion with experts (Shalihin & Mohamad, 2019; Zainal et al., 2017).

Identified associated factors includes demographic data of the medical doctors: age, gender, ethnicity, religion, undergraduate training, status of the profession, number of years of practice, smoking status, number of smokers seen per week and history of attending smoking cessation program. While demographic data of the clinic includes the clinic location and presence of specialist in the clinic (Shalihin & Mohamad, 2019; Zainal et al., 2017). Figure 1 shows the conceptual framework of the questionnaire:

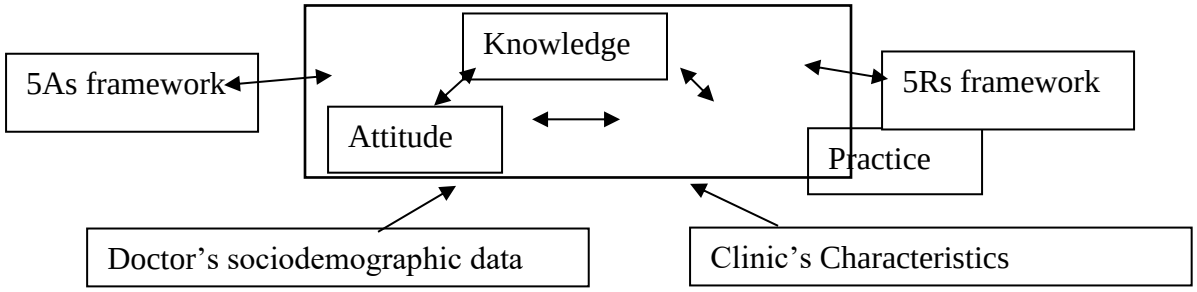

Figure 1: Conceptual Framework of the Scale of Knowledge, Attitude and Practice of Medical Doctors on Smoking Cessation Guidelines.

Expert Evaluation and Face Validation of the Items

The questionnaire and statements were reviewed by a group of experts as follows; smoking cessation experts, experienced questionnaire creators, statisticians and family medicine specialists. Face validation was later carried out among eight primary care doctors after correction. The primary care doctors were given 20 minutes to go through the items individually and they were encouraged to express freely their doubts and thoughts on the items. No items were removed.

Ethical Approval

The study has been approved by IIUM Research Ethics Committee (IREC 2018-240).

Respondents and Sample Size

The required number for validating the created questionnaire is about five persons per question (Atkinson et al., 2011, Bryant & Yarnold, 1995, Downing, 2004, O'Rourke & Hatcher, 2013). As this newly created questionnaire consists of 22 questions, the required sample size is about 22x5 = 120. In this validation study, we manage to get 131 respondents. Universal sampling is used in this medical symposium in view of big sample size requirement. All medical officers, family medicine registrars and family medicine specialists who work in the government health clinics participated in the medical symposium are included in this study.

Validation Study

The 22 items questionnaire as shown in Table 2 was completed by 131 government primary care doctors coming from all states of Malaysia during Medical Symposium 2018. These medical doctors volunteered to enrol in this study and informed consent was taken. They were instructed to fill in the questionnaire during the beginning of the symposium before distributing the questionnaire to them. Participants were asked to respond to all statements and no time limit was imposed. The study was completed in two days duration.

Statistical Analysis – Reliability and Construct Validity

Data was analysed using IBM SPSS software (Version 21.0, Malaysia). Reliability analysis was done using the Cronbach's alpha coefficient to determine the internal consistency of the 22 items questionnaire. Items with 'Cronbach's alpha value if item-deleted' could determine which statement highly contributed to the alpha value. If the 'Cronbach's alpha value for those items deleted' decreased, it indicated that the items highly contributed to alpha value. In contrast, if the 'Cronbach's alpha value for those items-deleted' increased, it indicated that the items poorly contributed to the Cronbach's alpha value. The items of this questionnaire were considered to represent a measure of high internal consistency if the Cronbach's alpha value was more than 0.7 (Atkinson et al., 2011, Bryant & Yarnold, 1995, Downing, 2004, O'Rourke & Hatcher, 2013).

Construct validity was done to measure the factor analysis and identify the similar components represent by the items. The best items represent each components were identified. The Kaiser-Meyer-Olkin value of more than 0.7 and significant value of the Bartlett's test of sphericity (p value < 0.001) is needed in providing significant components in the factor analysis (Atkinson et al., 2011, Bryant & Yarnold, 1995, Downing, 2004, O'Rourke & Hatcher, 2013).

Results

Demographic Data of the Respondents

A total of 131government primary care doctors responded. 106 (80.9%) were female doctors, 126 (96.21%) were Malay and Muslim doctors, 129 (98.5%) were non-smokers, 98 (74.8%) of the respondents were medical officers, 72 (55.0%) were graduated from local government universities, 91 (69.5%) of them had no training in smoking cessation services and 109 (83.2%) of them were not in charge of stop smoking clinic. The age of respondents range from 27 to 55 years of age.

Table 1: Demographic Data of the Respondents

Variables	Categories	Numbers of doctors (n)	Percentage (%)
Gender	Female	106	80.9
	Male	25	19.1
Age (in years)	$\geq$ 30	86	65.6
	< 30	45	34.4
Ethnicity	Malay	126	96.2
	Chinese	4	3.0
	Indian	1	0.8

Religion	Muslim	127	96.9
	Non-muslim	4	3.1
Place of graduation	Local government university	72	55.0
	Local private university	8	6.1
	Overseas	51	38.9
Training in smoking cessation	Yes	40	30.5
	No	91	69.5
In charge in smoking clinic	Yes	22	16.8
	No	109	83.2
Smoking status	Non-smoker	129	98.5
	Smoker	2	1.5
Profession	FMS/trainee	25	19.1
	Medical officer	106	80.9
Clinic with FMS/visit	Yes	66	50.4
	No	65	49.6
Clinic Location	Urban	60	45.8
	Suburban	71	54.2

Reliability Analysis

The Cronbach's alpha value of the 22 items was 0.872 which is considered to be significantly good. It is better compared to the initial previous 17 items of 0.824. If divided further into its subscales, gave the Cronbach's alpha value of 0.72 for knowledge, 0.58 for attitude and 0.92 for practice domains. Table 2 shows the corrected item-total correction for each items.

Table 2. Corrected Item-Total Correction for Each 22 Items

Items	Corrected Item Total Correction
'Assess' is the first component under 5A's of stop smoking clinical practice guidelines.	0.224
'Assign' is one of the components under 5A's of stop smoking clinical practices.	0.068
'Assist' is the subsequent component after you advice patient to quit smoking.	0.256
5R's is use for those who is unwilling to quit smoking at any time.	0.018
'Reusage' is the end component of 5R's framework of stop smoking clinical practice guidelines.	0.145
I feel that my effort in helping smokers to quit is not well rewarded.	0.196
Clinical practice guidelines are not relevant in improving patient smoking cessation.	0.193
Repetition in giving advice on quit smoking to patients is beneficial.	0.414
Framework in approaching chronic smoker is impractical.	0.278

Every providers should be provided with algorithm on treating chronic smoker.	0.260
I will check when is the last time that my patient smoked.	0.603
I advise the smokers to quit.	0.586
I advise the smokers to reduce amount of cigarettes per day.	0.468
I inquire the smoker's willingness to quit.	0.553
I provide the smokers with practical counseling.	0.614
I give further follow-ups for smokers quitting.	0.633
I encourage the smokers to indicate why quitting is personally important.	0.665
I ask the smokers to identify any potential harm to self from smoking.	0.685
I ask the smokers to identify negative consequences of continuing smoking.	0.658
I ask the smokers to identify advantages of quit smoking to their family.	0.683
I ask smokers why quitting is impossible.	0.675
I continuously inform the smoker's benefits of quit smoking.	0.712

Construct Validity

After discussion with experts and team members, we decided to keep all the items in view of each items are important to represent the domains. Factor analysis of the 22 items showed high value of Kaiser-Meyer-Olkin measure of sampling adequacy (0.821) and significant Bartlett's Test of Sphericity (< 0.001), which give rise to five components. The first component consists of practice of 5As (ask, advice, assess, assist, arrange) during the initial visit, and practice of 5Rs (Risk, Relevance, Reward, Repetition, Roadblocks). The second component consists of 5 items of knowledge domain. The third component consists of 5 items of attitude domain. The fourth component consists of practice of "advice and assess" items. The fifth component consists of repetitive items from knowledge and attitude domains.

In view of overlapping items, components with least similar item were deleted which include the fourth and fifth component as they were already be represented in the other components. (Refer to table 3 for components extracted from principal component analysis.) This leads to three final components extracted as the final product. All the 22 items were kept in the questionnaire.

Table 3. Components Extracted from Principal Component Analysis

	1	2	3	4	5
P12	.796				
P8	.782				
P10	.782				
P11	.771				
P9	.760				

P7	.759				
P6	.704				
P5	.698				
P2	.693			.430	
P1	.674				
P4	.664			.365	
P3	.576			.533	
A3			.390		
K1		.783			
K2		.750			
K5		.700			
K3		.695			
A4			.647		
A2			.646		
A1			.558		
K4		.296			.674
A5			.240		.590

***A = Attitude items, K = Knowledge items, P= Practice items**

Discussion

This study aims to determine the reliability and construct validity of the newly modified questionnaires on knowledge, attitude and practice of medical personnel on smoking cessation guidelines. Previous questionnaire which had been created was lack in the knowledge and attitude items in which there is an important need to re-modify the items in the questionnaire (Shalihin et al., 2018, Shalihin & Mohamad, 2019).

Reliability is defined as consistency or reproducibility of measurement over time or occasions, whereas validity is defined as to what extent the measurement measures what it should measure (Bryant & Yarnold, 1995, Rahman, 2015). Cronbach's alpha value is commonly used by researchers to determine the internal consistency of an instrument, while factor analysis is one of the methods used to evaluate the construct validity (Bryant & Yarnold, 1995, Downing, 2004, Rahman, 2015). Previous similar study that had been done locally before in terms of smoking

cessation guidelines had inadequate items in the domains as verified by the expert in questionnaire (Shalihin et al., 2018, Shalihin & Mohamad, 2019). The methods of validation also not up to minimum standard requirements (Shalihin & Mohamad, 2019).

This questionnaire was developed based on five main domains which include knowledge, attitude and practice of the 5A's and 5R's smoking cessation domain. It was constructed via literature review and input from the smoking cessation experts and family medicine specialists. As the 5A's and 5R's components relates more with practice of medical practitioners, practice items therefore made the major contribution in this questionnaire, in order to include all the ten components of the 5A's and 5R's smoking cessation practices (Malaysia & Physician, 2017, Panel, 2008).

The population in this study represents almost similar backgrounds of primary care doctors of the districts in Malaysia, mainly of female medical doctors of middle age group with at least two years of working experiences. The uniqueness of this study is that it involves districts from all states of Malaysia encompassing those in urban and rural regions, involving all strata of medical doctors in which the sociodemographic background is more homogenous and representable of Malaysian primary care setting.

The 22 items of this questionnaire produce a high Cronbach's alpha value of 0.872 for reliability analysis. Even though several of the items have low corrected-item total correlation value as in table 2, all the items were kept for the questionnaire finalization after proper discussion with the panel experts in smoking cessation training and guidelines. Factor analysis of the 22 items showed high value of Kaiser-Meyer-Olkin measure of sampling adequacy (0.821) and significant Bartlett's Test of Sphericity (< 0.001). Five components were extracted from factor analyses which later end up with three final components according to discussion with the expert panels.

The first component consists of six items of practice of 5As (ask, advice, assess, assist and arrange) and six items of practice of 5Rs (Risk, Relevance, Reward, Repetition, Roadblocks). These 12 items in this first component are actually the backbone of 5A's and 5R's frameworks that need to be practiced by medical personnel in counselling smokers in their daily practice. Ask, advice and assess items (3As) should be included in the initial encounter with smokers at the clinic. This later should be followed by practicing the 5R's items on those who are not ready to quit after assessing their willingness to quit (assess item). These five items need to be emphasized by medical personnel during subsequent visits to the health facilities until the smokers are finally ready to quit (Malaysia & Physician, 2017, Panel, 2008).

The second component represents the knowledge of providers regarding the smoking cessation guidelines. It assess the basic understanding of the contents of guidelines and the frameworks of 5A's and 5R's steps in smoking cessation counselling. Meanwhile the third component represents the attitude of the respondents towards the smoking cessation guidelines. It assess the response and stands of the health care providers towards the guidelines (Malaysia & Physician, 2017, Panel, 2008).

The fourth and fifth components basically represent the overlapping domain of practice, knowledge and attitude towards the smoking cessation guidelines which already represented by the first, second and third components. Removals of the other minor components are made in view of the small number of items which overlapped with the practice component that are already represented by the first and second components (Practice 3As, practice 5Rs and Practice Final 2As). There is no point of assessing the same components repeatedly. Removal of these minor components does not disrupt the main domains of the smoking cessation frameworks (Malaysia & Physician, 2017, Panel, 2008).

Findings from reliability analysis of the 22 items questionnaire (consists of three significant components) demonstrate high overall Cronbach's alpha value of 0.824. Each of the three components of this 22 items also demonstrate acceptable Cronbach's alpha as follows, in which two components show Cronbach's alpha of more than 0.7: as follow: Cronbach's alpha value of 0.72 for knowledge (Items 1-5) , Cronbach's alpha value of 0.58 for attitude (Items 6-10) and

Cronbach's alpha value of 0.92 for practice domains (Items 11-22).These findings were evidence to support and suggest that the 22 items questionnaire of knowledge, attitude and practice of medical personnel on smoking cessation guidelines is a reliable instrument that can be used in the future.

This study was confined among primary care doctors in which further study can be carried out in future to involve clinicians and pharmacists from tertiary centre. Nevertheless, this study had its own strength as it was able to involve respondents from various clinics (government and private sector) in Malaysia.

Conclusion

This study showed that this newly developed 22 items questionnaire is a valid and reliable tool to assess knowledge, attitude and practice of medical personnel in smoking cessation guidelines. It can be used in future studies for medical officers in the primary or tertiary centre. It can also be used to assess other support medical staffs such as paramedics and pharmacists who have been trained in stop-smoking training programme.

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