

ORIGINAL ARTICLE

DEVELOPMENT OF A QUESTIONNAIRE TO ASSESS KNOWLEDGE, ATTITUDE AND PRACTICE OF PULMONARY REHABILITATION PROGRAM AMONG PHYSIOTHERAPISTS IN PUBLIC HEALTH CARE SETTING

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ABSTRACT

Despite the benefits of Pulmonary Rehabilitation Program (PRP) on patients with chronic obstructive pulmonary disease (COPD), the implementation of the program remains low. An evaluation of knowledge, attitude and practice (KAP) particularly among physiotherapists as the PRP key players is therefore necessary. However, no KAP instrument for this practice area is available to date. This study intended to develop a KAP questionnaire which can be used to evaluate PRP implementation among physiotherapists working in the public health care settings. A questionnaire (KAP-PRP) was drafted based on findings of literature reviews and expert consultations. Content validation was performed with the involvement of six physiotherapy experts, while face validation involved 10 physiotherapists working in the medical discipline. The resulting 20-item questionnaire covering knowledge (10 items), attitudes (4 items), practice (5 items) and an open-ended item on possible barriers was then tested twice; initially on 152 physiotherapists, then on 70 physiotherapists from 16 Malaysian public hospitals to determine its construct validity and internal consistency, which were analyzed using factor analysis and Cronbach's alpha. The questionnaire has high content validity index (CVI) score (Item-CVI between 0.83 and 1.00 and Scale level-CVI >0.96) and was rated well by the experienced physiotherapists. Cronbach's alpha score of 0.58 for attitude, and 0.58 to 0.68 for practice domains, with average score of 0.68 were obtained, which indicate moderate, acceptable internal consistency. In conclusion, the KAP-PRP questionnaire is adequately valid and reliable, thus can be used to evaluate pulmonary rehabilitation program implementation among physiotherapists.

Keywords: Pulmonary Rehabilitation, Physiotherapy, Instrument

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a non-reversible but treatable, progressive airflow obstruction disease and one of the main causes of morbidity and mortality worldwide¹. The Global Burden of Disease Study² documented 251 million COPD cases in 2016 globally. A total of 3.17 million deaths were estimated due to the disease in 2015 which equals 5% of all deaths globally, with more than 90% of deaths occur in low and middle income countries. COPD is projected to increase further due to increased tobacco exposure, air pollution and population ageing².

Generally, the burden of COPD is greater in the Asian compared to the Western countries, in terms of the mortality rate and the years of the loss of quality of life. The different types of health care policy and medical practice in Asia have a significant impact on the disease burden³. In 2010, approximately 450,000 COPD cases were reported in Malaysia with an estimated burden of 210 billion Malaysian Ringgit (MYR)⁴. COPD also caused a substantial economic burden to both the patient

and society as a result of productivity loss due to compromised quality of life and early retirement⁵.

COPD is not curable, but clinical management is beneficial in relieving symptoms, reducing the risk of death and increasing physical performance and quality of life². Pulmonary rehabilitation program (PRP), being a component of the comprehensive COPD management is essential for patients who are persistently symptomatic and showing a reduction in daily function besides the standard medical treatment^{6,7}. Pulmonary rehabilitation is a well-known program and proven to improve exercise tolerance, reduce anxiety and lessen the severity of the symptoms in moderate to severe COPD patients⁸.

The benefits of PRP on patients with COPD also include improving functional capacity and decreasing dyspnea perception^{9,10}. However, despite being recommended as an important clinical intervention for this patient population in many international guidelines, the implementation of PRP is generally low. A study by Johnston and colleagues¹¹ reported several factors that lead to poor implementation of PRP

which include low referrals from the treating physicians, poor access to PRP setting and low attendance among patients.

The success of a PRP is attributed to the commitment of a multi-professional team, which consists of physician or medical specialist, physiotherapist, nursing staff, dietician, occupational therapist, pharmacist, social worker and psychologist¹². In many developing countries including Malaysia, the PRP is mainly managed by medical specialists and physiotherapists as the key players¹². Observation and informal survey in the main public hospitals of Malaysia found that only 30 out of 139 (21.5%) hospitals implement PRP in their settings. The reasons for the low implementation are not known due to unavailability of published studies in this topic. A survey on knowledge, attitude and practice (KAP) relating the implementation of PRP and its possible barriers may provide an insight in this subject area. A KAP study reveals what people know about certain issue, their feelings and how they behave¹³. A validated and reliable questionnaire is required to enable gathering of such information. However, to date, there is no published questionnaire on KAP for PRP available for usage among any health care professionals. Therefore, in this study, we intend to develop and validate a KAP survey questionnaire to assist in the evaluation of PRP implementation among physiotherapists working in public health care settings.

METHODS

The development and validation of the KAP survey questionnaire was carried out based on the guideline proposed by Radhakrishna¹⁴, which includes establishing a content and face validity by experts and evaluating the questionnaire reliability through field testing or a pilot study.

Questionnaire development

We developed the KAP-PRP questionnaire following an intensive literature review. Potential papers were retrieved from established databases namely google scholar, PubMed/Medline, science direct, research gate, ProQuest and Cochrane library using search key terms which included knowledge, attitude or behavior, practice, KAP, survey or questionnaire and pulmonary rehabilitation or therapy. A few relevant studies were reviewed; however, a study by Joseph et al.¹⁵ was referred to most in selecting items for the KAP-PRP survey questionnaire due to its relevancy to our study. In the study, the researchers assessed KAP regarding health promotion programs among a group of physiotherapists in Africa¹⁵.

The KAP-PRP questionnaire was developed in English language and consisted of 20 items: ten, five and four items in a 'knowledge', 'attitude' and 'practice' domain, respectively and one

open-ended item for a 'barriers' domain. Items in the knowledge domain are multiple-choice questions. Each question comprised of three answer options (yes, no and not sure), from which respondents are required to select only one option. There is only one correct answer for each item in the domain, which carries a score of 1, with the total possible score of 10. For the attitude and practice domains, the response option was in a form of a 5-point Likert scale consisting of 'strongly disagree', 'disagree', 'neutral', 'agree' and 'strongly agree', in which 'agree' and 'strongly agree' represent positive attitude and practice. The open-ended question used in the barrier domain was adapted from a previous study¹⁶ on barriers in implementing clinical practice guidelines among Dutch physiotherapists. Responses to this question could be analysed using the thematic analysis approach and key themes which represent 'barriers' identified.

Content validation

Content validity of the KAP-PRP questionnaire was determined with the involvement of six physiotherapists who have more than ten years of experience in managing pulmonary rehabilitation program in their respective hospital. The experts reviewed the domains and rated each item in the questionnaire in a face-to-face meeting based on four criteria: relevancy, clarity, simplicity and ambiguity¹⁷. Two content validity indexes (CVI) were then calculated based on the score for each item provided by the experts, namely item CVI (I-CVI) and scale-level CVI average (S-CVI/ave) based on a standard formula¹⁸. The experts were encouraged to provide feedbacks in verbal or written to improve the items relevancy and clarity. Feedbacks from the experts were used to refine the questionnaire, mostly with regards to its structure and wordings.

Face validation

Face validation of the KAP-PRP questionnaire was performed by ten physiotherapists (age range 25 to 45 years old) with at least one-year experience managing COPD cases in their workplace in a public hospital. The physiotherapists assessed the suitability, readability and understandability of the items in the questionnaire. Items suitability was scored using a 5-point Likert scale; 1= irrelevant and therefore unsuitable, 2= inadequate, 3= adequate, 4= very suitable for the purpose and 5= extremely suitable for the purpose. Time taken to complete the questionnaire by the respondents was also estimated.

Construct validity and reliability testing

The KAP-PRP questionnaire was tested for construct validity using the exploratory factor analysis with varimax rotation using the eigen value 1. The Kaiser-Meyer-Olkin (KMO) test and the Bartlett's test of sphericity were used to examine the sampling adequacy prior to factor

analysis. Items in the attitude and practice domains of the questionnaire were analyzed and factor loading score reviewed. Together with this process, the two domains were tested for reliability in term of internal consistency. Items in the knowledge domain were excluded from factor analysis because the items are known facts and not abstract ideas which require operational definition¹⁹.

The sample size required to perform the factor analysis was determined based on guideline by Field²⁰ i.e., number of samples preferably five to ten times greater than the total number of items in the questionnaire. We recruited a total sample of 152 physiotherapists from 16 public hospitals (mean age \pm SD = 33.1 \pm 7.9 years) for this process. Selection of the physiotherapists were done with the assistance from the physiotherapy manager of the identified hospitals based on specified inclusion criteria namely, 1) working on a full-time basis, 2) a minimum working experience of 1

year in the medical discipline and 3) provided informed consent. Physiotherapists who do managerial work for more than 50% of their working time were excluded. Public hospitals were selected because of the standardisation of hospital policy on matters relating case management. Responses collected from the respondents were evaluated to calculate factor loading.

Statistical analysis

The IBM Statistical Product and Service Solution (SPSS) Version 21 was used to analyze all data. Descriptive statistics were mainly used, and results presented as frequency (percentage) and mean (standard deviation). For the internal consistency interpretation, a Cronbach’s alpha score between 0.45 and 0.98 is considered as acceptable, with score between 0.5 and 0.75 shows moderate reliability and a value below the score indicates low reliability²¹⁻²².

Table 1 : Score for I-CVI and S-CVI of items in the KAP-PRP questionnaire

Item	Description	Item-Content Validity Index (I-CVI)			
		Relevant	Clear	Simple	Non-ambiguous
KNOWLEDGE					
1	Source of knowledge of PRP	1	1	1	1
2	Core Content of PRP	1	1	1	1
3	Phases of PRP	1	1	1	0.83
4	Duration of PRP	1	1	1	1
5	Outcome of PRP	1	1	1	1
6	Contraindications of PRP	1	1	1	1
7	Indications of PRP	1	1	1	1
8	Aims of PRP	1	0.83	0.83	1
9	Evidence about the effectiveness of PRP	1	1	1	1
10	Availability of Clinical Practice Guidelines	0.83	0.83	0.83	0.83
ATTITUDE					
11	Positive attitude towards PRP	1	0.83	1	0.83
12	Involvement in the government campaign on PRP	1	1	1	1
13	Not prefer to run PRP at workplace	1	1	1	1
14	Suggest to medical officers to refer suitable COPD patients for PRP	1	1	1	1
15	Believe that PRP is effective for COPD patients	1	1	1	1
PRACTICE					
16	Practising PRP at workplace	1	1	1	1
17	A) Conduct inpatient PRP B) Conduct outpatient PRP C) Conduct both in and out-patient PRP	1	1	1	1
18	Superior’s support for PRP	1	1	1	1
19	Chest physician/Medical specialist/officers’ support the implementation of PRP	1	1	1	1
20	Barriers of implementation of PRP	1	1	1	1
	Scale-level content validity index (S-CVI)	0.99	0.97	0.98	0.97
	Overall instrument CVI		1.00		

RESULTS

Content validity index

Overall, the experts rated the KAP-PRP questionnaire as relevant, clear, simple and non-ambiguous. However, there were suggestions for amendments on wordings and format for the response options. Table I shows the I-CVI and S-CVI/ave score for the relevancy, clarity, simplicity and ambiguity criteria of the questionnaire. The S-CVI/ave score range from 0.97 to 0.99 for the four criteria.

Face validity

Table II shows the results of the face validity of the questionnaire. With the exception of item number 13, all items were given the score of 5 ('extremely suitable') by majority of the respondents. For item 13, a total of seven out of ten respondents scored the item as 4 ('very suitable'). The questionnaire took five to ten minutes to be completed.

Factor loading and Cronbach alpha

KMO test (0.65) and the Bartlett's test of sphericity (Chi square, df= 278.26, 55; p < 0.001) showed that the sampling adequacy were met to proceed with factor analysis. Four factor solutions were generated to analyse the attitude and practice domains. Table III shows the factor loading and Cronbach's alpha scores for the four factors.

Following factor analysis on the 152 respondents, two items namely 'in and out-patients PRP' and 'does not prefer to run PRP in workplace' were deleted as they caused confusion to the respondents due to item redundancy. It was also found that the item 'outpatient PRP' in the practice domain (Factor 1) was not suitable to be grouped under the practice (support) domain and should be placed under the practice (implementation) domain. New construct was then formed, consisted of three components which comprised of attitude and practice. The practice domain was group into 2 sub-domains namely support (factor 2) and implementation (factor 3). We then recruited another 70 physiotherapists with the same inclusion criteria (age range 21 to 51 years) for the final construct validation and reliability testing. The KMO (0.611) and Bartlett's Sphericity test (Chi square, df= 151.66, 36; p < 0.01) which were performed for the 70 respondents confirmed that the sample size was adequate for factor analysis. The final factor loading, and Cronbach's alpha scores are shown in Table IV.

The finalized version of the questionnaire consisted of 20 items; ten knowledge items, four attitude items, five practice items which are grouped under 'support and implementation' of PRP and one item under the 'barriers of the implementation'. The finalized version of the questionnaire remains as 20 items despite the deletion of item due to renumbering of the items.

Table 2: Face validity of the KAP-PRP questionnaire

Item	Description	Adequacy and suitability score				
		1	2	3	4	5
KNOWLEDGE						
1	Source of knowledge of PRP				-	10
2	Core content of PRP				1	9
3	Phases of PRP				-	10
4	Duration of PRP				-	10
5	Outcome of PRP				-	10
6	Contraindication of PRP				-	10
7	Indication of PRP				2	8
8	Aims of PRP				1	9
9	Evidence about the effectiveness of PRP				-	10
10	Availability of clinical practice guidelines				-	10
ATTITUDE						
11	Positive attitude towards PRP				3	7
12	Involvement in the government campaign on PRP				4	6
13	Does not prefer to run PRP at workplace				7	3
14	Suggest to medical officers to refer suitable COPD patients for PRP				-	10
15	Believe that PRP is effective for COPD patients				-	10
PRACTICE						
16	Practising PRP at workplace				1	9
17	A) Conduct inpatient PRP				-	10
	B) Conduct outpatient PRP				-	10
	C) Conduct both In and Out-patient PRP				-	10
18	Superior's support for PRP				-	10
19	Chest physician/medical specialist/officers support the implementation of PRP				-	10
20	Barriers of implementation of PRP				-	10

Table 3: Factor loading and Cronbach alpha scores (n=152)

Factor	Item	Factor Loading	Cronbach alpha
1	Chest Physicians' Support	0.783	0.542
	Outpatient PRP	0.647	
2	Superior's support	0.601	0.533
	Involve in PRP campaign	0.788	
	Suggest to medical officers to refer suitable COPD patients for PRP	0.697	
3	Positive attitude towards PRP	0.521	0.601
	Conduct In and out patient PRP	0.796	
	Practising PRP	0.643	
4	Conduct Inpatient PRP	0.627	-0.609
	Does not prefer to run PRP	-0.727	
	Believe PRP is effective for COPD patients	0.695	
Cronbach alpha average		0.629	

Table 4: Factor loading and Cronbach alpha scores (n=70)

Factor	Item	Factor Loading	Cronbach Alpha
1	Positive attitude towards PRP	0.839	0.583
	Believe PRP is effective for COPD patients	0.823	
	Suggest to medical officers to refer suitable COPD patients for PRP	0.767	
	Involve in the government pulmonary rehabilitation campaign	0.433	
2	Superior's support for PRP	0.853	0.582
	Chest Physicians' support	0.798	
3	Practising PRP	0.853	0.683
	Conduct Inpatient PRP	0.744	
	Conduct Outpatient PRP	0.449	
Cronbach alpha average		0.680	

DISCUSSION

The main objective of this study was to develop a valid and reliable KAP questionnaire to assess issues related to the implementation of pulmonary rehabilitation program among the physiotherapists, being the key players of the program. To our knowledge, this is the first KAP-PRP questionnaire developed for this purpose.

We found that the KAP-PRP questionnaire has excellent content validity, demonstrated by S-CVI/average score of more than 0.95 for the four tested criteria. According to Polit and Beck²³, for an instrument to be regarded as having excellent content validity, the I-CVI score should be 1.00 when rated by three to five experts and at least 0.83 when rated by six experts. Our questionnaire was rated by six experts and obtained I-CVI score of 1.00 for most items, thus fulfilling this criteria for excellent validity. The content validity process was also conducted via a face-to-face method where experts were able to ask question and provide direct feedbacks, thus increased accuracy in evaluation in addition to ensuring good response rate¹⁸.

The questionnaire also demonstrates excellent face validity, whereby all but one item was perceived as 'extremely suitable' by the ten physiotherapists who rated the instrument. Item 'does not prefer to run PRP in workplace' which

belongs to the 'attitude' domain was still seen to be suitable by the ten respondents. However, this item was regarded as inappropriate and confusing by the majority of the 152 physiotherapists who participated in the field testing of the questionnaire. The reason for the confusion is not known as no further explanation was provided by the respondents. However, the item was removed to ensure overall clarity of the questionnaire.

A total of 70 physiotherapists were recruited for the final construct validity assessment of the KAP-PRP questionnaire. The sample size was smaller than the recommended number based on general rule of at least five samples per item. However, further testing for the adequacy of sample size using the Kaiser-Meyer-Olkin (KMO) test and suitability of our data for factor analysis using the Bartlett test of sphericity²⁴ yielded a score of 0.611 for the KMO with p value of <0.001 for the sphericity, which fulfilled the recommended value of >0.50 and p<0.05 respectively. Therefore, we are convinced that our construct validity process was accurate and yielded valid results to be reported. We recommend using this process in a situation where recruitment of samples based on general guideline is difficult due to specific circumstances.

The questionnaire reliability was measured in term of internal consistency, by looking at the Cronbach's alpha score. We found that the score

was between 0.58 to 0.68 for most of the items, with an overall score of 0.68. Although the score is not as good as we anticipated and indicates that a few items may not strongly related with each other, the overall score falls within the range of those regarded as moderately reliable²² and indicate that the reliability of KAP-PRP is acceptable. Our action in deleting a few problematic items following initial factor analysis has assisted in improving the internal consistency of the questionnaire.

Our study is not without limitations. Firstly, our validation of the KAP-PRP knowledge domain was rather superficial. We did not analyse and report the difficulty and discrimination indexes for items in the domain. Difficulty index can be reported as the percentage of respondents who record true or false answer for certain part in a multiple true-false questions, while discrimination index can be identified by evaluating how the 'good' respondents are doing versus the 'poor' respondents for a particular question²⁵. Testing these indexes would increase the accuracy of the items in measuring knowledge level among the targeted respondents. Secondly, the KAP-PRP is yet to be evaluated for test-retest reliability to further establish its reliability. Such reliability results can be used to further indicate which items to be retained, improved or removed. We recommend future KAP studies to include these steps in their questionnaire validity and reliability testing procedure.

CONCLUSION

The KAP-PRP questionnaire which was developed in this study appears to be adequately valid and reliable. This questionnaire can be used to evaluate the implementation of pulmonary rehabilitation program among physiotherapists and enable the planning of appropriate service improvement strategies. Further studies are recommended to strengthen the questionnaire validity and reliability.

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