

## My-VRBQ: TRANSLATION AND PRELIMINARY VALIDATION OF THE VESTIBULAR REHABILITATION BENEFIT QUESTIONNAIRE (VRBQ)

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### ABSTRACT

**Introduction:** The purpose of this study was to translate and adapt the Vestibular Rehabilitation Benefit Questionnaire (VRBQ) into Malay (My-VRBQ). This is to add on to the limited number of vestibular questionnaire available in Malay version. **Methods:** After the permission from the original author was obtained, the process of adaptation began with forward-translation by the author with audiological background and a linguistic expert. Then, the process of backward translation into English were completed by three bilinguals who were proficient in both Malay and English. The final version of the draft was evaluated for its content validity, which was conducted by five professionals with audiological or speech pathology backgrounds. Additionally, its face validity was determine amongst 32 respondents with diverse backgrounds. Ten participants diagnosed with vestibular problems were recruited in the My-VRBQ for internal consistency validation process. They were enlisted from two hospitals in the East Coast of Malaysia. **Results:** Based on the comments and suggestions made by the validators; some changes in terms of the appropriateness of the instructions, items and the sentence structure were made. In the consistency analysis, the My-VRBQ revealed good internal consistency based on Cronbach alpha values (0.77 to 0.96). **Conclusion:** A translated and

validated My-VRBQ has the potential to be used clinically to document vestibular rehabilitation benefits. Nevertheless, future studies are encouraged to further support the present study findings.

**KEYWORDS:** *Dizziness, Vertigo, Vestibular problem, Vestibular Rehabilitation*

## INTRODUCTION

Vestibular rehabilitation is a series of graded exercises for patients who have yet to recover from vestibular pathology. This exercise is intended to expedite vestibular compensation to reduce the symptoms of dizziness and/or vertigo, improve gaze stability and postural control in which ultimately aiming for the patients to be able to function normally. Vestibular rehabilitation not only has shown an extensive benefits to patients with peripheral type of vestibular pathology (Hansson, 2007; Meli, Zimatore, Badaracco, De Angelis, & Tufarelli, 2006), but a considerable betterment has also been reported for those who had central and other cause of dizziness and/or vertigo (Han, Song, & Kim, 2011; Meli et al., 2006).

Many studies on vestibular rehabilitation have utilized subjective measurements such as self-answered questionnaires to measure the improvements perceived by the patients. The self-answered questionnaires were shown to be more accurate in subjectively capturing the improvement perceived by the patients and it would be independent of the assessors contributions (Valderas et al., 2008). Vestibular Rehabilitation Benefits Questionnaire (VRBQ) was a relatively new questionnaire developed by Morris, Lutman & Yardley (2009). The questionnaire was aimed to assess dizziness, anxiety, and motion provoked dizziness, as well as to capture the improvement in the quality of life (QoL) of patients in response to vestibular rehabilitation (Vitkovic, Winoto, Rance, Dowell, & Paine, 2013). The 22 items divided into two parts are believed to cover the main aspect of dizziness and its impact (Morris, Lutman, & Yardley, 2009). In Part A, items 1 to 11 assess two domains of dizziness, which are the frequency of the dizziness symptoms and the severity of the motion-provoked dizziness. Whereas in Part B, items 12 to 22 measure the changes in the patients' QoL preceding the vestibular rehabilitation that they have completed.

Typically, two types of translations are used: forward translation and backward translation (Sousa & Rojjanasrirat, 2011; Toma, Guetterman, Yaqub, Talaat, & Fetters, 2017). The forward translation is the process of converting the questionnaire from the original language (e.g. English) into the target language. In contrast, the backward translation is to convert the translated questionnaire back into its original language (e.g. English). Proper validation method should be proceeded after the process of translation. The validation is essential to ensure that the questionnaire is measuring what it is supposed to measure (Kazi & Khalid, 2012), the content is appropriate to the aim of the questionnaire, the questions are understandable to the target population and the overall layout and style are good (Parsian & AM, 2009).

The VRBQ is currently available only in English and German version. For it to be utilised among Malay-speaking population, it should be translated and adapted into Malay language. As mentioned by Kazi & Khalid (2012), translation of a questionnaire that is not yet available in the language is a necessary for the population to understand the questions before answering them. The translation is necessary not only for it to be apprehensible for Malay-speaking population, but also to include and consider local context, and cultural issues. Principally, even though the words are in different language, the aim is to preserve the semantic of the questionnaire identical to the original version so that the respondents would be able to rate and express their perceptions in their native language. Thus, the purpose of this study was to adapt the Vestibular Rehabilitation Benefit Questionnaire (VRBQ) in order to cater for the limited availability of vestibular questionnaire in Malay version.

## METHODOLOGY

This present study had two phases; Phase 1 involved forward- and backward- translations and Phase 2 was about the validation processes.

**Phase 1: Forward & Backward translations****1) Forward-translation**

The initial translation into Malay language was done independently by the researcher who has audiological background and a linguistic expert, both are experts in both languages. Proceeding the translations, discussions were made to delineate any conflicts and discrepancies in terms of its structure and grammar. After several discussions, the first version of the Malay translated VRBQ was ready for backward translation and named as My-VRBQ.

**2) Backward-translation**

The first draft of the translated version was distributed to three persons who are proficient in both Malay and English languages. They were requested to translate the Malay translated VRBQ back to English. The process of backward translation was done independently by the professionals. The researcher was available for any guidance. The content and semantics of the sentences were the main focus during this procedure.

**Phase 2: Content & face validation and internal consistency analysis**

All of the comments and suggestion from the experts during the forward and backward translation were considered for amendments. The My-VRBQ was finalized and submitted for content and face validations.

**1) Content validation**

The content validation was conducted by five professionals with audiological or speech pathology backgrounds. Using a content validation form, they were asked to comment on the apprehensibility of the instructions, accuracy of the scale measuring the items and the appropriateness of the items to fit the content of the questionnaire. The comments were descriptively analysed.

**2) Face validation**

In the face validation process, 32 respondents with diverse backgrounds were recruited to verbally comment on 1) whether the sentences and phrases were apprehensible and; 2) the overall layout of the questionnaire.

Following the content and face validation tasks, amendments were finalized. The reliability of My-VRBQ was then determined with Cronbach's alpha analysis.

**3) Internal consistency analysis**

In this task, 10 vestibular disordered patients with varieties of causes were enrolled. They were recruited purposively from two tertiary hospitals from the East Coast region of Malaysia. Herein, the inclusion criteria were those diagnosed with vestibular disorders by clinical experts and undergoing vestibular rehabilitation. They were instructed to fill in My-VRBQ accordingly. Using SPSS version 20, the internal consistency of this questionnaire was then calculated using Cronbach's alpha analysis. If the coefficient alpha value is 0.7, it would be clinically accepted. It was deemed a good consistency if the value was between 0.80 and 0.95.

**RESULTS****Phase 1: Forward & backward translation****1) Forward translation**

During forward translation, most of the sentences in the Part B were structurally modified to generate a much more language-appropriate questionnaire to the Malay-speaking population while maintaining the semantic of the sentence. Difficulty was to choose words that suit the questionnaire, particularly for the seven likert scale response. After a thorough discussions,

additional word was added to construct a more distinct different between the options. The example is illustrated in Table 1.

Table 1. Example of adding words to phrases

Original Words	Translated Words	Words Changes	Items involved
"mildly dizzy"	"sedikit pening"	"agak sedikit pening"	7-11
"extremely dizzy"	"terlalu pening"	"terlampau pening"	

## 2) Backward translation

The structure of the sentences and the words were different amongst the three translators but they were consistently preserving the same context as the original version. If the phrases or sentences were interpreted the same as in the English version, the Malay translated phrases or sentences would be accepted. In some sentences, however, alternative words were chosen to best represent the intended meaning as in the original questionnaire.

For example in Item 12:

The original version: *Compared to before the dizziness, I feel comfortable travelling*

Translation A: *Compared to the previous condition before I have the dizziness problem, I can go travelling at ease for now*

Translation B: *As compared to before I was experiencing the dizziness, I now feel comfortable to travel*

Translation C: *If compared my condition to before I have this dizziness problem, now I feel comfortable in travelling*

Since all the translators translated the Malay version almost identical to each other and comparable to the original version, the Malay translated version for item 12 was accepted.

## Phase 2: Content & face validation and internal consistency analysis

### 1) Content validation

Four academicians with audiological and speech-pathology background, and one audiologist were invited to comment on three aspects of the questionnaire: comprehension of the instructions, accuracy of the scale measuring the items and the relevance of items included in the questionnaire. The comments from the five validators were consistent. Overall, they were satisfied with the instructions except for three instructions that were highlighted by the experts as hard to be understood. In terms of the accuracy of the measuring scale, all the five validators agreed that the scales were accurate to measure the items. The items were agreed to be appropriate in the questionnaire except for items 12 to 22. Items 12 to 22 were suggested to be simplified by two experts for a better clarity. The items 12 to 22 were then modified structurally to make it comprehensible to the patients.

All of the comments and suggestions were weighted and the phrases were revised accordingly. Only three items in Part B (14, 18 and 22) required further amendments. For items 14 and 18, the response option was changed from negative to positive response. These changes were necessary to facilitate better understanding and would not affect the scoring marks. Details of the comments and suggestions are summarized in Table 2 and list of changes are tabulated in the Table 3.

### 2) Face validation

Recalled that in this task, 32 respondents were involved. All of them were university students (age ranging from 20 to 24 years old) with non-medical backgrounds. Overall, most of the respondents involved in this face validation process were satisfied with the layout and the structure of the questionnaire. However, they had some difficulty in understanding items 12 to 22. Based on the comments, items 12 to 22 were further improved to facilitate better understanding of the questionnaire.

### 3) Internal consistency analysis

Ten participants with equal number of male and female were involved in the validation process. The age of the participants were ranged from 29 to 71 years old. Five participants

were diagnosed with Benign Paroxysmal Positional Vertigo (BPPV), three participants had recurrent vestibulopathy, one participant was diagnosed as having Mal deBarquement syndrome and another participant had no definite diagnosis yet but the main complaint was having vertigo. All of the participants were under vestibular rehabilitation that were either conducted by the physiotherapists or trained audiologists.

Data from ten respondents were used for internal consistency analysis. The Cronbach's alpha values were excellent for motion-provoked dizziness (0.96) and quality of life (0.95), good for dizziness (0.87) and acceptable for anxiety (0.77). The Cronbach's alpha value and coefficients item-total correlation are tabulated in Table 4.

Table 2. Comments and suggestions for content validation

	<b>Validator 1</b>	<b>Validator 2</b>	<b>Validator 3</b>	<b>Validator 4</b>	<b>Validator 5</b>
Are the instructions well understood?	Yes except <i>"dalam sehari pada minggu-minggu sebelum ini"</i>	Yes	Yes	Yes except <i>"bahagian ini mengenai masalah pening yang anda alami apabila anda melakukan sesuatu pergerakan"</i>	Yes except <i>"dalam sehari pada minggu-minggu sebelum ini", "masalah lain yang tidak berkaitan", "bahagian ini mengenai berapa kerap anda mengalami simptom-simptom yang berikut" and also "bahagian ini mengenai masalah pening yang anda alami apabila anda melakukan sesuatu pergerakan"</i>
Does the rating scale accurately measure the items?	Yes	Yes	Yes	Yes	Yes
Does each item reflects the benefit of vestibular rehabilitation?	Yes except items 12-22. The arrangement of the sentences need an improvement	Yes	Yes	Yes except items 12-22. The meaning of the items are different from the original version and problematic particularly item number 14,17 and 19	Yes

Table 3. List of changes

	Items	English Items	Malay Items	
			Before	After
Instruction	-	"...on a typical day in the last week"	"...dalam sehari pada minggu-minggu sebelum ini"	"...dalam kehidupan seharian pada minggu-minggu sebelum ini"
	-	"...problems that you think are caused by another condition"	"...masalah lain yang tidak berkaitan"	"...masalah lain yang tidak berkaitan dengan masalah pening yang pernah anda alami"
	-	"This section is about how often you experience different feelings"	"Bahagian ini mengenai berapa kerap anda mengalami simptom-simptom yang berikut"	"Bahagian ini mengandungi pernyataan tentang kekerapan anda mengalami tanda-tanda yang berikut"
	-	"This section is about how dizzy you get when you move around"	"Bahagian ini mengenai masalah pening yang anda alami apabila anda melakukan sesuatu pergerakan"	"Bahagian ini mengandungi pernyataan tentang tahap masalah pening yang anda alami apabila anda melakukan sesuatu pergerakan"
Subscale	1-6	"quite often"	"kerap"	"agak kerap"
	1-6	"not very often"	"tidak kerap"	"jarang"
	7-11	"very slightly dizzy"	"kurang pening"	"sangat sedikit pening"
	7-11	"mildly dizzy"	"agak sedikit pening"	"sedikit pening"
	7-11	"really quite dizzy"	"pening"	"agak pening"
	14	"a little bit less"	"sedikit tidak susah"	"sedikit mudah"
		"quite a bit less"	"tidak susah"	"agak mudah"
		"a lot less"	"sangat tidak susah"	"sangat mudah"
	18	"a little bit less"	"sedikit tidak baik"	"sedikit teruk"
		"quite a bit less"	"tidak baik"	"agak teruk"
"a lot less"		"sangat tidak baik"	"sangat teruk"	
22	"a lot more"	"kerap terlibat"	"sangat melibatkan diri"	
	"quite a bit more"	"masih terlibat"	"agak melibatkan diri"	
	"a little bit more"	"jarang terlibat"	"sedikit melibatkan diri"	
	"a little bit less"	"tidak kerap terlibat"	"sedikit tidak melibatkan diri"	
	"quite a bit less"	"tidak terlibat"	"agak tidak melibatkan diri"	
	"a lot less"	"tidak terlibat langsung"	"sangat tidak melibatkan diri"	
Sentence structure	12-22	"Compared to before the dizziness, I feel comfortable travelling"	"Saya berasa selesa untuk pergi melancong sebelum saya mengalami masalah pening ini. Tetapi sekarang saya berasa"	"Jika dibandingkan dengan keadaan sebelum saya mengalami masalah pening ini, sekarang saya berasa selesa untuk pergi melancong"

Table 4. Item-total correlation and Cronbach's alpha coefficient for My-VRBQ

Subscale	Item	Corrected Item-Total Correlation	Cronbach's alpha
Dizziness	1	0.59	0.87
	3	0.85	
	5	0.84	
Anxiety	2	0.59	0.77
	4	0.41	
	6	0.92	
Motion-provoked dizziness	7	0.89	0.96
	8	0.81	
	9	0.92	
	10	0.94	
	11	0.86	
Quality of life	12	0.71	0.95
	13	0.77	
	14	0.68	
	15	0.87	
	16	0.87	
	17	0.48	
	18	0.94	
	19	0.73	
	20	0.93	
	21	0.81	
	22	0.76	

## DISCUSSION

Many studies on vestibular rehabilitation have used self-answered questionnaires rather than objective measures to quantify benefits or improvements following the dedicated rehabilitation procedures. Even though the vestibular compensation could also be observed through objective measurements, self-answered questionnaires were found to be more sensitive in documenting the improvements perceived by the patients. The subjective measurements could appropriately reflect the handicapping effects of the dizziness and/or vertigo and the effectiveness of a treatment for the individuals (Jacobson & Newman, 1990).

The Vestibular Rehabilitation Benefits Questionnaire (VRBQ) was mainly developed to measure the improvements perceived by an individual in response to a vestibular rehabilitation (Morris et al., 2009). As such, it has been validated by a group of patients who had undergone vestibular rehabilitation. It was found to be sufficiently responsive even to small changes of improvement. In fact, its effect size was higher than Vertigo Symptom Scale (VSS), Dizziness Handicap Inventory (DHI) and Short Form Survey 36 (SF36) (Morris et al., 2009). Taken together, it would be best to use the translated version of the VRBQ to the local population to determine the effectiveness of vestibular rehabilitation.

During the translation processes, a minimum of two translators were advised for the translation purposes in which one translator should have the medical knowledge on the content of the questionnaire while another translator should be someone without medical knowledge but experts in both languages (Sousa & Rojjanasrirat, 2011). As in this study, the forward translation was performed as suggested. Thus, the translated version had considered both medical and layman language that incorporated the local and cultural contexts. The backward translation was completed



by three experts in Malay and English languages to ensure that the Malay translated version was able to convey the meaning of the original questionnaire. These translation processes allow transparency and simplification of the phrases and sentences in the questionnaire (Sousa & Rojjanasrirat, 2011).

In face validation task, items 12 to 22 were reported as “difficult to understand” by the respondents. It is worth noting that for items 12 to 22, the respondents were required to compare their current conditions with their previous conditions when doing the daily activities. These items are clinically important to document the specific improvements in vestibular symptoms following specific treatments or interventions amongst vestibular disordered patients. In this task, since all respondents were healthy and have not experienced any vestibular symptoms, perhaps it would be difficult for them to understand and acknowledge these items. Regardless, proper steps had been taken to further improve the clarity of the items to ensure that they could be delivered efficiently to the patients in the subsequent task.

In the present study amongst 10 patients with vestibular disorders, the My-VRBQ was found to be internally reliable. In particular, its Cronbach’s alpha values for internal consistency ranged from 0.77 to 0.96. These values are high and comparable to the Cronbach’s alpha values of the English version of VRBQ, which ranged from 0.73 to 0.92 (Morris et al., 2009). It was generally agreed that the value of the Cronbach’s alpha should be at least 0.70 to be considered acceptable for a new test instrument (Parsian & AM, 2009). In line with this, Parsian & AM (2009) stated that the value of more than 0.90 indicated that the questionnaire was highly reliable. The item-total correlation values between items in the My-VRBQ was greater than 0.3, which are sufficient to indicate that this questionnaire has good internal reliability (Elson et al., 2013).

## CONCLUSION

In the present study, the English version of the VRBQ has been translated into Malay version using forward and backward translations processes. The validity and reliability of the My-VRBQ were assessed accordingly. The refined version of My-VRBQ was found to have good validity and reliability to serve its purpose. This questionnaire has potential to be used clinically and to document vestibular rehabilitation benefits. Nevertheless, future large-scale studies are encouraged to further support the present study findings.

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