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Rapid Eye Movement Sleep Behavior Disorder Screening Questionnaire in Persian: A Report on the Translation Process

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ABSTRACT

Background: Rapid eye movement sleep behavior disorder (RBD) is a condition where there are changes in muscle tone during REM sleep, leading to abnormal movements. This disorder is typically diagnosed using video polysomnography (VPSG), which is considered the gold standard test. However, a screening questionnaire for RBD (RBDSQ) has been developed, translated, and validated in various languages, and could be used as a low-cost alternative to VPSG. In this study, we followed a standard multi-step process to translate the RBDSQ into Persian.

Methods: As per the guidelines suggested by Mapi Research Trust, we followed a four-step process for translation. The process included forward translation, backward translation, cognitive interviews with fifteen patients, and proofreading. We collaborated with Mapi Research Trust in each step of the process. Also, we conducted discussion and revision sessions for each step to ensure that the final translation was accurate.

Results: After reviewing the forward and backward translations, some of the items were rephrased. Patients who participated in cognitive interviews found the translation to be generally clear, but some improvements were necessary to make it more expressive. The final proofreading process involved correcting some typing and spelling errors.

Conclusions: The Persian translation of RBDSQ was approved by Mapi Research Trust through a standard translation process. This translation is now compatible with the original English version and is available for a future clinical validation study.

Keywords: REM sleep behavior disorder, surveys and questionnaires, translations

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Introduction

Rapid Eye Movement (REM) Sleep Behavior Disorder (RBD) is a type of sleep disorder in which the typical REM sleep atonia is absent. As a result, simple or complex motor behaviors like sudden limb movements, vocalization, and gestures take place along with dreams (Dauvilliers et al., 2018). Various studies have estimated that RBD affects around 0.5-1% of the general population and 2% of older adults (AASM, 2023; Haba-Rubio et al., 2018; Kang et al., 2013). RBD can be subcategorized as idiopathic RBD (iRBD) and symptomatic RBD (sRBD) based on clinical course and etiology (Wang et al., 2015). Early diagnosis of iRBD is crucial as it plays an important role in the later development of alpha-synuclein neuropathology, which increases the risk of Parkinson's disease, multiple system atrophy, and dementia with Lewy bodies (Bušková et al., 2019; Iranzo et al., 2014).

It is often necessary to conduct a sleep study called Video Polysomnography (VPSG) to diagnose sleep disorders. During VPSG, physiological activities of the brain, eyes, skeletal muscles, and heart are monitored and recorded using Electroencephalography (EEG), Electrooculography (EOG), Electromyography (EMG), and Electrocardiography (ECG). Furthermore, oxygen saturation, oronasal airflow, and respiratory efforts are monitored by finger pulse oximetry, thermistors, and thoracoabdominal muscle activity recordings (Rundo & Downey III, 2019). Standard VPSG can confirm RBD diagnosis following clinical impression when dream-enacting behaviors are present in patients' or sleeping partners' histories (St Louis & Boeve, 2017). However, VPSG may not be accessible or affordable in some cases. There are alternative diagnostic tools that mainly rely on clinical symptoms. Examples of such clinical rating scales are the RBD screening questionnaire (RBDSQ), the REM Sleep Behavior Disorder Questionnaire Hong Kong (RBDQ-HK), the Innsbruck REM Sleep Behavior Disorder Inventory, and the Mayo Sleep Questionnaire (MSQ) which can be useful when VPSG is not available (St Louis & Boeve, 2017). The RBDSQ is a 13-item screening questionnaire developed by Stiasny-Kolster et al. The original questionnaire is in German and English and covers different domains of sleep behavior symptoms with yes/no questions that patients can answer alone or with the help of their companions. It can evaluate various aspects of disturbed sleep, including the frequency and content of dreams, body movements, and vocalizations in response to dreams, and history of nervous system disease (Stiasny-Kolster et al., 2015; Stiasny-Kolster et al., 2007). In contrast to VPSG which is an in-lab test that takes hours at night, administration of RBDSQ is more feasible. Therefore, researchers have become interested in studying the linguistic and clinical validity of RBDSQ in several languages such as Italian, Czech, Brazilian, Japanese, Chinese, Korean, and Turkish (Bušková et al., 2019; Lee et al., 2015; Marelli et al., 2016; Miyamoto et al., 2009; Pena-Pereira et al., 2020; Tarı Cömert et al., 2016; Wang et al., 2015).

Translating a questionnaire involves multiple steps and it is not just a matter of translating word by word. It's crucial to comprehend the original concept and then adapt it to the target language and culture. This process ensures that the translation is appropriate and acceptable. It results in a coequal translation, which means that it's of equal quality to the original (McKown et al., 2020). As far as the authors know, RBDSQ has not been formally translated or tested for accuracy in the Persian language. The purpose of this study is to use a standardized translation process to ensure the linguistic validity of RBDSQ for the Persian-speaking population and make it available for a potential clinical validation study in the future.

Methods

This article provides a detailed account of the Persian translation and linguistic validation process of the RBDSQ questionnaire. This process aimed to create a version of the questionnaire that is

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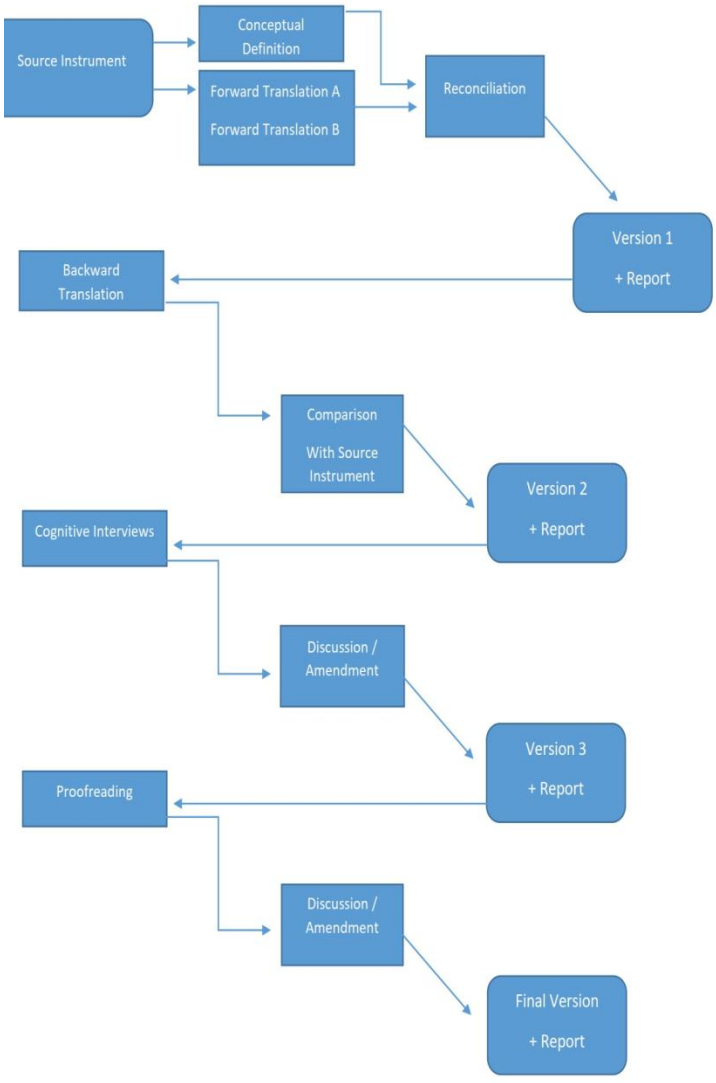
easily understandable by the Persian-speaking population. The study was carried out between March and June 2021 and involved expert opinions and feedback from participants. The questionnaire will then be tested for validity and reliability in a separate clinical study. Before conducting the study, we obtained ethical approval from the Research Ethics Committee of the Tehran University of Medical Sciences. Additionally, we obtained permission from Mapi Research Trust (Mapi) to use the original questionnaire in English as the source. Mapi is responsible for copyright issues and quality control of the RBDSQ linguistic validation process.

The translation process was conducted in accordance with the Mapi guidelines for Linguistic Validation of Clinical Outcome Assessments (COAs) (Acquadro et al., 2012). This approach involved forward and backward translation, patient cognitive interviews, and proofreading. Figure 1 provides an outline of the process.



For this step, two local translators who were native Persian speakers fluent in English were involved. After conceptualizing the questionnaire, we created two independent forward translations. In order to ensure that the items were accurately translated and easy to comprehend, a thorough discussion and reconciliation took place. Following this step, the first Persian version of the

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questionnaire was created.

In this phase of RBDSQ production, an English and Persian bilingual native speaker translated the initial version of the questionnaire into English. This translator, who lacked access to the original questionnaire in the source language, was not a medical professional. To ensure accuracy, the back-translated version was compared to the original English questionnaire. After conducting a comprehensive review by a panel of clinical experts including the authors of this document, the team took into account additional feedback and recommendations to finalize the second Persian translation.

In this step, the second version of the translation was tested on a group of native Persian speakers to ensure that it was clear and understandable. The group consisted of 15 participants, aged between 24 and 69, of which 7 were female and 8 were male. They were selected from patients and their companions who were visiting a neurology clinic at one of the hospitals of the Tehran University of Medical Sciences. All participants were able to read and write in Persian without any assistance. During individual interviews, the participants were presented with the second version of the translation and were asked to read each item and explain their understanding of it. They were also asked to suggest alternatives if they found any part of the questionnaire unclear. The issues were discussed with the participants and any necessary changes were made with the help of clinicians. This step resulted in the creation of a third translated Persian version.

The third iteration of the RBDSQ translation underwent proofreading by a native speaker of Persian who was also proficient in English. This step involved a thorough review of the document to identify and correct any typing, spelling, or grammatical errors, resulting in the final translated version.

Results

The process of standardized translation produced a linguistically validated RBDSQ that is understandable and consistent with the original English version.

Some of the items were rephrased after comparing the forward translations A and B. The Persian word for “dream” can be both “خواب” and “رؤیا”. The word “خواب” in Persian can be back-translated as “sleep” and “dream”, and it is commonly used by the Persian-speaking population for both meanings. Furthermore, to make the term "vivid" more descriptive, it was necessary to add the phrase "انگار واقعی هستند" which means "as if they are real". One item in this questionnaire that couldn't be summarized in a single Persian word was "fights". It refers to any bodily movements during sleep that resemble fighting. Therefore, it was translated into “ انگار که دعوا می کنم” to make it understandable.

The word “saluting” needed to be clarified for an appropriate translation. It was translated to mean either "giving formal military respect" (“ سلام نظامی دادن”) or "saying hello" (“سلام کردن”). Ultimately, the latter was selected. When translated back, it was rendered as "Greeting". The Merriam-Webster Dictionary (Merriam-Webster, Inc.), defines the word “salute” as “to give a sign of respect, courtesy or goodwill to, to greet”. Since “saluting” in this questionnaire referred to the act of showing respect when greeting someone, it could appropriately appear as “ سلام کردن یا ادای احترام”. During the back-translation process, some minor inconsistencies were discovered. For instance, “aggressive” and “action-packed” were back-translated as “violent” and “eventful”, respectively. Despite the inconsistencies found, no changes were made as they had identical meanings. Table 1 provides an outline of the issues that were encountered during the translation process and the corresponding changes that were implemented to address them.

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Table 1. An overview of the translation into Persian following the algorithm of the linguistic validation process

Items of RBDSQ*	Covered concepts	Forward Translation	Backward Translation	Changes made after patient testing	Proofreading
1	Vivid dreams	"Vivid dreams" into " خواب های بسیار واضح و شفاف که انگار واقعی هستند".	Same as the original version	No changes	Minor corrections
2	Aggressive or action-packed content	Straightforward	Minor literal difference with the same meaning	The phrase " رؤیاهای من در خواب" was restated as " خواب هایی که می بینم "	No changes
3	Movements of the body corresponding to dreams	Straightforward	Same as the original version	No changes	Minor corrections
4	Knowing the movements in sleep	Straightforward	Minor literal difference with the same meaning	No changes	No changes
5	Hurting oneself or a sleeping partner	Straightforward	Minor literal difference with the same meaning	No changes	No changes
6	Experienced phenomena during dreams	- "fights" into " انگار که دعوا می کنم" - " saluting" into " سلام کردن یا ادای احترام"	"saluting" into "greeting"	The phrase " یک یا چند مورد از" (meaning one or more items) was added at the beginning of this item	Minor corrections
7	Being woken up by movements	Straightforward	Same as the original version	No changes	No changes
8	Remembering the contents of dreams	Straightforward	Same as the original version	No changes	Minor corrections
9	Disturbed sleep	Straightforward	Minor literal difference with the same meaning	No changes	No changes
10	History of a disease of the nervous system	Straightforward	Minor literal difference with the same meaning	No changes	Minor corrections

*RBDSQ: Rapid eye movement (REM) sleep behavior disorder screening questionnaire
* Contact information and permission to use the original instrument: Mapi Research Trust, Lyon, France.(https://eprovide.mapi-trust.org)

Fifteen participants reported minimal difficulty understanding the Persian RBDSQ items, finding them generally expressive. However, a few issues were discussed. Three participants expressed their curiosity regarding the exact definition of "گاهی" which is the Persian equivalent of "sometimes". As the frequency of symptoms was not specified in the original questionnaire, the word's general concept appeared pertinent. Three participants wanted to know more about the difference between items 4 (I know that I move my arms or my legs in my sleep) and 7 (At times I'm woken up by my movements) in the questionnaire. We clarified that item 4 referred to the *movement* of the limbs in their sleep and item 7 to *waking up* due to it. Since the majority of the participants were able to

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distinguish these items without any problems, they were left unaltered. Some respondents asked whether they were supposed to have experienced one or all of the phenomena listed in item 6 (I experience or have experienced the following phenomena during my dreams) to answer the question with a "yes". The given examples could each be considered a positive point if experienced and therefore, the phrase "یک یا چند مورد از" (meaning one or more of the items) was added to the beginning of this item. Respondents were also informed that positive answers could include subjective individual experiences and observations by sleeping partners. Table 2 presents the characteristics of the participants who took part in the cognitive interviews, along with their comments.

After proofreading, we resolved spelling and typing errors in the Persian translation of RBDSQ, and the final version was created.

Table 2. Characteristics of the respondents in cognitive interviews

Age (years)	GenderΔ	RBDSQ* Score	Are items expressive and understandable?	Discussion
51	M	7	Yes	- Items 4 and 6.2 share a similarity - Items 4 and 7 share a similarity - The Persian "خواب" is a better alternative for "رؤیا" which is the translation for "dream" - Item 6 is investigating both subjective symptoms and the feedback from the sleeping partner - Item 6 refers to one or more of the phenomena. The phrase "یک یا چند مورد از" (meaning one or more of the items) should be added.
32	M	5	Yes	
24	M	1	Yes	
42	F	5	Yes	
39	F	3	Yes	
54	F	4	Yes	
26	M	6	Yes	
54	M	7	Yes	
57	F	6	Yes	
28	F	5	Yes	
69	M	3	Yes	
61	F	4	Yes	
37	M	3	Yes	
31	F	2	Yes	
39	M	3	Yes	

*RBDSQ: Rapid eye movement (REM) sleep behavior disorder screening questionnaire
ΔM: Male, F: Female

Discussion

As discussed in the literature review, the REM sleep behavior disorder screening questionnaire (RBDSQ) has been validated and translated into multiple languages. The current study aimed to embark on an effort to linguistically validate this tool for Persian-speaking patients. The present study contributes to the research domain by utilizing a systematic process to translate this assessment tool into Persian.

Obtaining a high-quality translation of a questionnaire that is originally in a foreign language is the first crucial step for its subsequent clinical usage. A word-for-word translation is usually not sufficient to yield a favorable outcome. To ensure a good selection of words in the Persian language that are culturally accepted and can be used in everyday conversations, we sought feedback from expert clinicians as well as the participants of the pilot testing. During this process, we emphasized the importance of expressiveness and understandability of the Persian version of the RBDSQ, especially through cognitive interviews with fifteen individuals. These interviews revealed no major difficulties in understanding the RBDSQ items. This can be due

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to the precision of the translation as well as the comprehensibility of the items in the original RBDSQ. The developers of RBDSQ have reported that the symptoms covered by this tool are perceived well by patients from different countries and languages of origin. Therefore, the translation and cultural adaptation of the RBDSQ items become convenient across different nations (Emery et al., 2017).

One of the limitations of this study was the small number of interviewees. However, the translation steps were conducted in agreement with the Mapi Research Trust guideline for linguistic validation (Acquadro et al., 2012). In addition, similar studies have been conducted with smaller groups of patients (Khouri et al., 2019; Sundh & Ekström, 2017). The Patient-Reported Outcome (PRO) Consortium's translation process also indicates that a minimum of 5 participants are acceptable for the cognitive interviewing step (Eremenco et al., 2018). However, recruiting a larger population for the pilot testing might result in a more precise integration of the respondents' attitudes and culture into this work.

RBDSQ is a diagnostic tool that can potentially save time and money by avoiding unnecessary expenses. Conducting this translation was the first step toward the ultimate goal of providing a valid and reliable Persian version of this tool. To be able to implement the Persian version of RBDSQ in clinical settings, further research is required to examine its validity and reliability in a clinical study based on using polysomnography data as the definitive diagnostic tool for RBD. Such a clinical study can provide appropriate statistics that enable researchers to evaluate and compare results among different study populations.

Conclusion

Following a step-by-step standard translation process, the original RBDSQ has been successfully translated into Persian. This Persian version is understandable and compatible with the original version's general structure and language. This screening tool is now available to be tested for validity and reliability through a supplementary clinical study on Persian-speaking patients.

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Not applicable.

Conflicts of interest

The authors have no competing interests to disclose.

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Ethical considerations

Ethics approval was granted by the Research Ethics Committee of the Tehran University of Medical Sciences. Informed consent was obtained from the participants in the cognitive interviews.

Code of Ethics

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Authors' contributions

The authors confirm their contribution to the paper as follows: study conception and design: VA; data collection: HAF, AS; interpretation of results: MS, VA; manuscript preparation: MS, RB. All authors read and approved the final manuscript.

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