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The Validity and Reliability of the Persian version of the Motion Sickness Assessment Questionnaire and Misery Scale

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Abstract

Background: Motion sickness can be induced by both real and simulated movement. Questionnaires such as the Motion Sickness Assessment Questionnaire (MSAQ) and the Misery Scale (MISC) assess susceptibility but require cultural adaptation for non-English speakers. This study aims to translate and adapt these instruments into Persian (MSAQ-P and MISC-P) and evaluate their validity and reliability.

Methods: The MSAQ and MISC were translated into Persian and underwent cross-cultural adaptation. A sample of 70 participants, comprising 21 experienced pilots, 27 pilot students, and 22 non-pilot students, completed the MSAQ-P, MISC-P, Numerical Rating Scale-Persian (NRS-P), and MSSQ-Short-P. The psychometric properties of the MSAQ-P and MISC-P, including face validity, concurrent validity, discriminant validity, internal consistency, and test-retest reliability, were evaluated.

Results: The MSAQ-P and MISC-P demonstrated strong face validity. Concurrent validity was confirmed by high correlations between total MSAQ-P and NRS-P (r=0.79, P=0.002), MISC-P (r=0.86, P<0.001), and MSSQ-short-p (r=0.84, P<0.001). Discriminant validity was supported by significant differences in mean scores of MSAQ-P and MISC-P among the three study groups (P<0.05). Internal consistency was evidenced by Cronbach's alpha of 0.97 for the MSAQ-P total score and 0.83, 0.86, 0.89, and 0.88 for gastrointestinal, central nervous system, peripheral, and sopite-related symptoms, respectively. Finally, test-retest reliability was excellent, with ICC values ranging from 0.96 to 0.998 for the MSAQ-P and 0.88 for the MISC-P.

Conclusion: The MSAQ-P and MISC-P exhibit cultural appropriateness, robust validity, and reliability, rendering them valuable instruments for evaluating motion sickness in Persian-speaking populations.

Keywords: MSAQ, MISC, Motion sickness, Misery, Persian, Reliability, Validity

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Introduction

Motion sickness is a well-documented syndrome characterized by nausea, vomiting, dizziness, and fatigue, which arises from real or simulated motion (e.g., travel, virtual reality). The vestibular system, essential for maintaining balance, plays a central role in this condition. Although the exact cause remains under investigation, it is believed that a mismatch between vestibular, visual, and proprioceptive signals triggers the symptoms. Individual susceptibility varies due to genetic and environmental factors (1-5).

The prevalence of motion sickness varies significantly across different environments. Car sickness affects up to

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Key Messages:

↑What is "already known" in this topic:

Questionnaires serve as essential tools for evaluating motion sickness, particularly in large-scale studies or initial screenings. Several instruments are available for assessing susceptibility, including the Motion Sickness Assessment Questionnaire (MSAQ) and the Misery Scale (MISC). The MSAQ has also been culturally adapted into Greek.

→What this article adds:

The Persian adaptations of the Motion Sickness Assessment Questionnaire and Misery Scale were successfully translated and customized for Persian-speaking communities. Both instruments exhibited excellent psychometric properties, including validity, reliability, and cultural relevance, thereby proving effective for assessing motion sickness among Persian speakers.

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4% of individuals, while trains present a minimal risk of less than 0.13%. Student pilots face a higher initial risk, ranging from 10% to 31%, which diminishes with experience. Seasickness, the most prevalent form, affects up to 25% of passengers on large ships and may reach as high as 60% in rough seas. Spaceflight is particularly challenging, with approximately 80% of astronauts experiencing motion sickness initially (6-8).

Several tools are available to assess susceptibility to motion sickness. However, no method has yet demonstrated sufficient accuracy in predicting all factors associated with motion sickness, including sex, age, psychological characteristics, adaptation, and retention. Consequently, a reliable screening process for selecting military pilots remains absent. Questionnaires serve as central tools for identifying individuals likely to experience motion sickness, describing the full range of symptoms, and tracking their severity during exposure. These questionnaires are widely utilized due to the limitations and impracticality of objective physiological tests in many settings (10, 11).

The Motion Sickness Assessment Questionnaire (MSAQ) is a well-validated instrument that evaluates motion sickness as a multidimensional construct (12). It provides a standardized and reliable method for researchers and clinicians to quantify individual susceptibility and differentiate symptoms across four dimensions: gastrointestinal, central, peripheral, and sopite-related. The psychometric properties of the Greek version of the MSAQ have been previously assessed (13). Additionally, the Misery Scale (MISC) is a rating scale commonly used to express the level of motion sickness experienced by individuals; each level is anchored to specific symptoms and ordered based on a consensus regarding the progression of motion sickness symptoms over time and increasing levels of discomfort (14,15). However, for accurate assessment in non-English speaking populations, culturally adapted and validated translations are essential. To address the lack of validated Persian versions of the MSAQ (MSAQ-P) and MISC (MISC-P), we aimed to translate and adapt these instruments into Persian and assess their psychometric properties.

Methods

Measures

Motion Sickness Assessment Questionnaire

The MSAQ is a tool developed to assess motion sickness across four distinct dimensions: gastrointestinal, central nervous system, peripheral system, and sopite-related symptoms. The MSAQ comprises 16 items, each describing a specific symptom associated with motion sickness. Participants rate the extent to which each statement reflects their experience on a scale from 1 (Not at all) to 9 (Severely). The overall motion sickness score is calculated using the formula (sum of points from all items/144)*100. Subscale scores are derived by calculating the percentage of points scored within each factor: (sum of gastrointestinal items/36)*100; (sum of central nervous system items/45)*100; (sum of peripheral items/27)*100; (sum of sopite-related symptoms items/36)*100 (12). The raw MSAQ total score ranges from 16 to 144. When converted to a percentage scale using the formula, the MSAQ-P total score varies from approximately 11 to 100. In this study, all MSAQ-P and subscale scores are presented as percentages.

Misery Scale

The MISC is an 11-point discomfort rating scale utilized to assess motion sickness. It comprises symptom descriptions and corresponding ratings as follows: No Problems: 0, Stuffy or Uneasy Feeling in the Head: 1 or 2, Stomach Discomfort: 3 or 4, Nauseated: 5 or 6, Very Nauseated: 7 or 8, Retching: 9, and Vomiting: 10. The MISC serves as a more efficient and straightforward tool for evaluating the severity of motion sickness, with subjects rating their discomfort level based on the provided descriptions (14). The MISC score ranges from 0 to 10.

Translation

The Motion Sickness Assessment Questionnaire and Misery Scale were translated into Persian following a rigorous process aligned with the International Quality of Life Assessment (IQOLA) protocol (16). Two independent translators provided initial versions through forward translation. Researchers then selected a consensus translation, which was subsequently reviewed by vestibular experts for clarity and cultural relevance. Items with low ratings or discrepancies underwent further refinement until a consensus was achieved. The final Persian translation was back-translated into English to ensure equivalence and received final approval from the original developers (17-19) (Appendixs 1 and 2).

Participants and Procedure

A total of 70 participants from the Iranian Air Force, comprising 21 experienced pilots, 27 pilot students, and 22 non-pilot students, were enrolled in the study. Participants were required to have no history of neurological, otological, visual, gastrointestinal, cardiovascular, or psychological issues to qualify. Exclusion criteria included an individual's unwillingness to continue participating in the study or loss of eligibility due to changes in their neuro-otological health status. Written informed consent was obtained from all participants. The study protocol was approved by the Human Research Ethics Committee of Iran University of Medical Sciences (IR.IUMS.REC.1398.41445795) and was conducted at Beesat Hospital in Tehran.

Before evaluating the questionnaires, all participants underwent a Coriolis cross-coupling stimulus using a motorized rotating chair. They were rotated at a constant speed of 120 degrees per second (°/s) for two minutes with their eyes closed. During the rotation, participants followed the researcher’s prompts, turning their heads along three axes: roll, pitch, and yaw, at a speed of 60 degrees per second (13). The stimulus was terminated when participants reported moderate nausea, as indicated by a MISC-P score of 7 for motion sickness severity. For the assessment of test-retest reliability, participants also received the Coriolis rotating stimulus prior to completing the questionnaires.

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Statistical analysis

Data were analyzed using SPSS (Version 17.0, SPSS Inc., Chicago, IL, USA). The Kolmogorov-Smirnov test was conducted to assess the normality of the MSAQ-P and MISC-P data distributions. Given that the data were normally distributed, all tests applied were parametric. The content validity of MSAQ-P and MISC-P was deemed high due to the strong content validity of the original versions, which remained unchanged in the Persian version. Face validity was evaluated based on feedback from 30 randomly selected non-pilot students and 16 experts in the field of vestibular evaluation regarding the understandability and cultural appropriateness of each item. To evaluate concurrent validity, we employed Pearson correlation to examine the relationships between MSAQ-P and three other questionnaires (MISC-P, NRS-P, and the Persian version of the Motion Sickness Susceptibility Questionnaire-Short Form (MSSQ-Short-P)) (11).

Discriminant validity was assessed by comparing mean scores on the MSAQ-P and MISC-P across three groups: experienced pilots, pilot students, and non-pilot students, using a one-way ANOVA. Prior to conducting the one-way ANOVA, we evaluated the assumption of homogeneity of variances using Levene's test. Internal consistency was assessed using Cronbach's alpha, with values ranging from 0.7 to 0.95 considered high (20). To evaluate test-retest reliability, participants were exposed to the same Coriolis stimulus two weeks later and completed the MSAQ-P and MISC-P questionnaires again. The intra-class correlation coefficient (ICC) was reported, with values exceeding 0.75 indicating excellent reliability, 0.6-0.75 indicating good reliability, and 0.4-0.59 indicating fair reliability (20). Furthermore, to calculate the Smallest Detectable Change (SDC), we used the formula: $SDC = 1.96 \times \sqrt{(2 \times SEM)}$, where the Standard Error of Measurement (SEM) was determined as $SEM = SD \times \sqrt{(1 - ICC)}$. The floor and ceiling effects were calculated as the percentage of participants with the lowest or highest possible scores, with effects exceeding 20% of the variance considered significant (22).

Results

Study subjects

Seventy men participated in this study, comprising 21 experienced pilots, 27 pilot students, and 22 non-pilot students. Their ages ranged from 21 to 44 years, with a mean age of 29 years (SD = 8). Experienced pilots were older (M = 41.10, SD = 4.30) than both pilot students (M = 24.39, SD = 0.83) and non-pilot students (M = 24.95, SD = 2.34).

Face Validity

After administering the MSAQ-P and MISC-P, both participants and experts assessed the understandability and cultural adaptation of the instruments. All items received high scores, indicating minimal comprehension issues or cultural biases. Items that scored high, but not at 100%, were subsequently discussed in a group setting, which included the primary translators and investigators.

Concurrent Validity

The NRS-P score demonstrated a strong positive correlation with all MSAQ-P subscales and the total score (r: 0.71 to 0.82, $P<0.05$). Similarly, the MISC-P and MSAQ-P total scores exhibited a strong positive correlation (r=0.86, $P=0.001$). Additionally, a positive correlation was identified between the total scores of the MSAQ-P and MSSQ-Short-P (r=0.84, $P=0.001$) (Table 1).

Discriminant Validity

Table 2 presents the mean (SD) scores of the MSAQ-P and MISC-P across the three participant groups. Levene's test confirmed that the assumption of homogeneity of variances was satisfied for all comparisons (all $P>0.05$), thereby justifying the use of one-way ANOVA. The results indicated significant differences ($P<0.05$) among groups for all variables, including the total MSAQ-P score, all subscales, and MISC-P. Post-hoc Tukey tests revealed that experienced pilots scored significantly lower than both pilot students and non-pilot students on the total MSAQ-P score and all subscales. Similar findings were observed for the MISC-P (Table 3).

Internal Consistency

The internal consistency of MISC-P reached a Cronbach's α of 0.96, while the MSAQ-P achieved a Cronbach's α of 0.97 for the total score, with values of 0.83, 0.86, 0.89, and 0.88 for the gastrointestinal, central nervous system, peripheral, and sopite-related symptoms, respectively.

Reliability

Test-retest reliability analysis revealed strong associations between the MSAQ-P total scores (ICC=0.998, $P=0.001$), gastrointestinal symptoms (ICC=0.978, $P<0.001$), central nervous system symptoms (ICC=0.987, $P<0.001$), peripheral symptoms (ICC=0.964, $P=0.001$), and sopite-related symptoms (ICC=0.973, $P=0.001$), indicating excellent concordance. Similarly, a high correlation (ICC=0.880, $P<0.001$) was observed for the MISC-P total scores. The SEM values were calculated as follows: 0.66 for the MSAQ-P total score, 2.25 for gastrointestinal symptoms, 1.82 for central nervous system symptoms,

Table 1. Pearson correlation coefficient (p-value) between Motion Sickness Assessment Questionnaire-Persian, NRS-Persian, Misery Scale-Persian, and Motion Sickness Susceptibility Questionnaire-short form-Persian scores.

	NRS-P	MISC-P	MSSQ-Short-P
MSAQ-P total	0.79 ($P=0.002$)	0.86 ($P<0.001$)	0.84 ($P<0.001$)
Gastrointestinal	0.71 ($P<0.001$)	0.75 ($P<0.001$)	0.81 ($P<0.001$)
Central nervous system	0.82 ($P<0.001$)	0.74 ($P<0.001$)	0.77 ($P<0.001$)
Peripheral	0.78 ($P<0.001$)	0.79 ($P<0.001$)	0.84 ($P<0.001$)
sopite-related symptoms.	0.69 ($P<0.001$)	0.66 ($P<0.001$)	0.72 ($P<0.001$)

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Table 2. Descriptive statistics and comparison of Motion Sickness Assessment Questionnaire-Persian and Misery Scale-Persian by one-way ANOVA. (n=70)

Score	Pilot students n=27				Experienced pilots n=21				Non-pilot students n=22				ANOVA
	Min	Mean (SD)	Median	Max	Min	Mean (SD)	Median	Max	Min	Mean (SD)	Median	Max	F (2, 67), p-value
MSAQ-P total	17	38 (11)	39	57	16	25 (7)	24	44	38	56 (8)	56	69	66.889 (0.001)
Gastrointestinal	11	38 (12)	39	58	14	25 (8)	22	47	36	55 (9)	56	72	52.375 (0.001)
Central nervous system	13	37 (12)	40	62	16	26 (8)	22	42	31	57 (10)	57	73	50.255 (0.001)
Peripheral	19	39 (10)	41	63	15	25 (9)	22	44	30	56 (10)	56	70	52.786 (0.001)
sopite-related symptoms	14	38 (12)	39	64	11	25 (9)	25	42	42	55 (8)	56	69	48.435 (0.001)
MISC-P	2	2 (0.74)	2	5	2	5 (2)	5	9	3	6 (2)	6	10	25.161 (0.001)

Min: Minimum, Max: Maximum, MSAQ-P: Motion Sickness Assessment Questionnaire-Persian, MISC-P: Misery Scale-Persian. All scores are expressed in percent.

Table 3. Comparison of Motion Sickness Assessment Questionnaire-Persian and Misery Scale-Persian scores between study population by Post Hoc Tukey.

	Mean differences (95% confidence interval)		
	Experienced Pilots vs Pilot students	Experienced pilots vs non-pilot students	Pilot students vs non-pilot students
MSAQ-P total	-12.68 (-18.75: -6:62) P= 0.001	-30.48 (-36.84: -24.12) P= 0.001	-17.79 (-23.78: -11.81) P= 0.001
Gastrointestinal	-13.12 (-19.87: -6.38) P= 0.001	-29.81 (-36.89: -22.73) P= 0.001	-16.68 (-23.35: -10.02) P<0.001
Central nervous system	-11.48 (-18.65: -4.32) P<0.001	-30.95 (-38.46: -23.44) P= 0.001	-19.46 (-26.54: -12.39) P= 0.002
Peripheral	-13.91 (-20.84: -6.99) P<0.001	-31.01 (-38.27: -23.76) P= 0.001	-17.10 (-23.94: -10.27) P<0.001
sopite-related symptoms	-12.83 (-19.88:-5.78) P= 0.001	-30.17 (-37.56: -22.78) P= 0.001	-17.34 (-24.30: -10.38) P= 0.001
MISC-P	2.75 (4.02: 1.50) P= 0.002	3.83 (5.16: 2.50) P= 0.004	1.07 (2.30: 0.15) P= 0.002

MSAQ-P: Motion Sickness Assessment Questionnaire-Persian, MISC-P: Misery Scale-Persian. All scores are expressed in percent.

2.98 for peripheral symptoms, and 2.56 for sopite-related symptoms. The SEM value for MISC-P was 0.75. Based on these SEM values, the SDC was calculated as 1.83 for the MSAQ-P total score, 6.23 for gastrointestinal symptoms, 5.04 for central nervous system symptoms, 8.25 for peripheral symptoms, and 7.09 for sopite-related symptoms. The SDC for MISC-P was 2. The paired-sample t-test did not detect a statistically significant difference between the test and retest for the MSAQ-P total score (mean difference ± SD = -0.12±87, 95% CI = -0.33 to 0.08, *P*=0.224), gastrointestinal symptoms (mean difference ± SD = 0.35±3.23, 95% CI = -0.41 to 1.13, *P*=0.360), central nervous system symptoms (mean difference ± SD = 0.09±2.57, 95% CI = -0.51 to 0.71, *P*=0.758), peripheral symptoms (mean difference ± SD = -0.37±4.23, 95% CI = -1.38 to 0.64, *P*=0.467), and sopite-related symptoms MSAQ-P sub-scores (mean difference ± SD = -0.27±3.63, 95% CI = -1.14 to 0.58, *P*=0.525). In MISC-P, the mean difference was ± SD = 0.4±3, 95% CI = -4 to 7, *P*=0.280.

Ceiling and floor effects

The total scores of the MSAQ-P ranged from 16 to 44 (mean = 25, SD = 7) for pilots, from 17 to 57 (mean = 38, SD = 10) for pilot students, and from 38 to 69 (mean = 56, SD = 8) for non-pilot students. No ceiling effect was detected, as no participants achieved the maximum score. However, a potential floor effect was observed among pilots, with 25% scoring the minimum on the MSAQ-P. In contrast, only 7% of pilot students scored at the lowest point, and no floor effect was noted among non-pilot students.

The total MISC-P scores ranged from 2 to 5 (mean = 2, SD = 0.74) for pilots, from 2 to 9 (mean = 5, SD = 2) for pilot students, and from 3 to 10 (mean = 6, SD = 2) for non-pilot students. Similar to the MSAQ-P, the distribution of MISC-P scores across all three groups was relatively normal. While 13% and 10% of pilot and non-pilot students, respectively, scored at the minimum, a notable 25% of pilots did so on the MISC-P, indicating a potential floor effect within this group.

Discussion

The MSAQ-P and MISC-P were developed and culturally adapted in this study. Our findings demonstrate the strong validity and reliability of both instruments, with psychometric properties closely aligning with those reported for the original English versions (12).

Participant evaluations confirmed face validity by demonstrating both understandability and cultural appropriateness. This ensures that participants comprehend the questions, thereby minimizing potential bias arising from cultural factors.

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Concurrent validity was evident through strong positive correlations between the MSAQ-P and established motion sickness measures (NRS-P, MISC-P). This finding demonstrates that the MSAQ-P scores align with those of other recognized measures, thereby strengthening its validity. Furthermore, these results are consistent with previous research on the original MSAQ-P version, which reported strong correlations between total scores and established measures such as the Pensacola Diagnostic Index (PDI: r=0.81, P<0.001) and the Nausea Profile (NP: r=0.92, P<0.001) (12). This pattern of convergent validity was further supported by a robust positive correlation observed between the total scores of the MSAQ-P and MSSQ-Short-P (r=0.84, P<0.001). This finding suggests that individuals with a higher susceptibility to motion sickness, as indicated by the MSSQ-Short-P, also reported experiencing more severe symptoms on the MSAQ-P. Studies have demonstrated that genes involved in balance, the nervous system, and glucose homeostasis are important for susceptibility to motion sickness, with heritability estimated at 57% (23-26).

Discriminative validity was confirmed by statistically significant differences in MSAQ-P, subscale, NRS-P, and MISC-P scores between the pilot group and other field student groups. This finding indicates that the MSAQ-P can effectively distinguish between individuals with varying levels of susceptibility to motion sickness.

Moreover, numerous studies demonstrate that habituation, achieved through repeated exposure to motion and combined visual-vestibular training, effectively reduces symptoms of motion sickness (27-30).

Internal consistency was evidenced by Cronbach's α>0.83 in both MISC-P and MSAQ-P. These results align with findings from the Greek version of the MSAQ, where Cronbach's alpha values further supported construct validity (total score: 0.92, subscales: 0.73-0.94).

Test-retest reliability analyses revealed strong correlations for both MSAQ-P scores and the MISC-P, indicating that the instrument generates consistent scores over time. This consistency is essential for ensuring reliable measurement across multiple administrations. Similarly, the Greek version of the MSAQ demonstrated high test-retest reliability, with total score and subscale correlations exceeding 0.94 (13).

This study suggests that the MSAQ-P and MISC-P may exhibit differing sensitivity across groups. While the MSAQ-P displayed potential floor effects among pilots, the MISC-P also indicated a similar trend, implying that these measures may not adequately capture the motion sickness susceptibility of experienced pilots. This finding aligns with pilots' superior performance in physical and psychological tasks, rendering them preferred candidates in many assessments among applicants.

Limitations

This study has several limitations that should be considered when interpreting the results. First, half of the participants were members of the Iranian Air Force, resulting in a sample that is quite homogeneous and specific to their occupation. Consequently, the psychometric properties of the MSAQ-P and MISC-P reported here may not be fully applicable to female or civilian Persian-speaking groups. The relatively low motion sickness scores and floor effects observed in experienced pilots may stem from occupational selection and adaptation developed through military aviation training and experience. Additionally, the experimental procedure utilized a symptom-based stopping criterion, terminating the motion stimulus once participants scored 7 or higher on the MISC-P. This approach prevented participants from reaching the highest levels of motion sickness severity, thereby limiting the ability to effectively assess ceiling effects for the MSAQ-P. Further validation studies involving more diverse Persian-speaking populations, including women and civilians, are recommended.

Conclusion

This study successfully validated the MSAQ-P and MISC-P, demosnstrating their strong validity, reliability, and cultural appropriateness. These findings establish them as valuable tools for assessing motion sickness in Persian-speaking populations.

Acknowledgment

None.

Conflict of Interests

The authors declare that they have no competing interests.

Authors' Contributions

Mehrnaz Hosseini and Abdollah Moossavi contributed equally to all aspects of the work, including study design, data collection, analysis, and manuscript drafting. Reza Eslami participated in the study design and revisions. Mohsen Ahadi was involved in data interpretation and supervision. Shohreh Jalaie managed the statistical analyses and reviewed the manuscript. Arash Zare Sadeghi also contributed to the study design.

Ethical Considerations

Human Research Ethics Committee of Iran University of Medical Sciences (IR.IUMS.REC.1398.41445795).

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Data Availability

The datasets used in this study are available from the corresponding author upon request.

AI Use Statement

The authors did not use artificial intelligence or AI-assisted technologies in the preparation of this manuscript.

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Appendix 1. Persian version of MSAQ

پرسشنامه ارزیابی ناخوشی حرکتی

دستورالعمل: با استفاده از مقیاس زیر، لطفا میزان آگاهی دقیق از تجربیات خود را در این مورد توضیح دهید:

به شدت

۱-۲-۳-۴-۵-۶-۷-۸-۹

اصلا	
۱- *احساس ناخوشی معده داشتم) گ(*	۹- احساس گم گشتگی داشتم (م ر)
۲- *احساس ضعف داشتم) م ر(*	۱۰- *احساس خستگی /ماندگی داشتم)*
۳- *حس ناراحتی بی قراری داشتم)*	۱۱- احساس تهوع داشتم (گ)
۴- خیس عرق شدم (م ح)	۱۲- احساس گر گرفتگی داشتم (م ح)
۵- دل آشوبه داشتم (و)	۱۳- احساس گیجی داشتم (م ر)
۶- احساس سبک سری داشتم (م ر)	۱۴- *احساس میکردم انگار که می چرخم) م ر(*
۷- *احساس خواب آلودگی داشتم)*	۱۵- *احساس بالا آ دن داشتم) گ(*
۸- *احساس یخ کردن یا عرق سرد داشتم) م ح(*	۱۶- بد حال بودم (و)

نکته: گ: دستگاه گوارش؛ م ر: مرکزی؛ م ح: محیطی؛ و: مربوط به وارفتگی

امتیاز کلی ناخوشی حرکتی با محاسبه درصد کل امتیازات به دست آمده: (مجموع امتیازات از همه موارد / ۱۴۴) × ۱۰۰.

امتیازات خرده مقیاس ها با محاسبه درصد امتیازات درون هر عامل بدست می آید: (مجموع موارد گوارشی / ۳۶) × ۱۰۰؛ (مجموع موارد مرکزی / ۴۵) × ۱۰۰؛ (مجموع موارد محیطی / ۲۷) × ۱۰۰؛ (مجموع موارد مربوط به وارفتگی / ۳۶) × ۱۰۰.

Appendix 2. Persian version of MISC

مقیاس آزردگی *(MISC)*

نشانه		امتیاز
بدون مشکل		۰
ناراحتی (بدون نشانه مشخص)		۱
گیجی، گر گرفتن، سردرد، بیقراری معده، عرق کردن و …		
	خیلی کم	۲
	کم	۳
	متوسط	۴
حالت تهوع	شدید	۵
	کم	۶
	متوسط	۷
	شدید	۸
		۹
استفراغ	(نزدیک به) اوغ زدن	۱۰

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