

# Marathi Translation, Cross-cultural Adaptation, Reliability and Validity of Motion Sickness Susceptibility Questionnaire- Short form

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## Abstract

**Background:** Marathi is the fourth most common spoken language in India. English serves as a barrier to the population of the state where Marathi is the prime language. A Marathi version of the Motion sickness susceptibility questionnaire would provide Maharashtra community Children and adults would be provided opportunity to communicate more effectively with their therapist. Hence, there is the need to translate the MSSQ short form into Marathi for the ease of its use. Motion sickness is a feeling of unwellness and introduces a significant safety risk. Motion sickness is nausea caused by motion, especially when travelling in a vehicle. Other symptoms include vomiting, headaches, sweating, increased salivation, drowsiness, dizziness and warmth/flushing. Motion sickness susceptibility questionnaire Short form can be used for paediatric population. Validity of MSSQ Short form is better than other motion sickness scale hence Cross Cultural Adaptation and translating the scale was done for the better understanding in paediatric population.

**Methodology:** The main version of the MSSQ short form was translated into the Marathi language. The translation and cultural adaptation Guidelines given by WHO were as follows, Forward translation, expert panel back-translation, pre-testing and cognitive interviewing, and final version. The Final agreed Marathi version was administered to 50 patients. **Results:** After an exact translation process, the Marathi version MSSQ short form was found to exhibit face validity. The reliability was tested by measuring internal consistency and test-retest method. The Cronbach's alpha for MSSQ = 0.94 with 95% confidence interval. Correlation between MSSQ-M on day 1 and day 15 were highly significant. The interclass coefficient was 0.8 with 95% confidence interval. **Conclusion:** The Marathi, non-English version MSSQ-short form is reliable and valid.

**Keywords:** MSSQ short form, Translation, Marathi version, Motion sickness, Reliability, Validity, Children.

## Introduction

Motion sickness is a unpleasant feeling of unwellness exhibiting varied signs and symptoms<sup>[1]</sup>. Motion sickness is physiological state that can be defined along four dimensions: gastrointestinal, central, peripheral, and sopite. Broadly the symptoms are nausea caused by motion, especially when travelling in a vehicle. Gastrointestinal symptoms include queasiness, disorientation, vomiting, and stomach discomfort. Central symptoms include feeling faint-like, dizzy, lightheaded, and a sensation of spinning, also exhibit pallor. Peripheral symptoms include feeling clammy,

sweaty, and hot/warm. Sopite related symptoms include feeling annoyed, drowsy, fatigued, and uneasy<sup>(2)</sup>

Motion sickness occurs when spatial orientation- in which direction the body is pointed, in which direction it is moving, and about which axes it is rotating- is disrupted. Motion is sensed by the brain through 3 pathways of the nervous system, (1) the inner ear(sensing motion, acceleration, and gravity), (2) the eyes(vision), and (3) the deeper tissues of the body surface(proprioceptors). Feedback from the muscles and joint sensory receptors can also be important. A second explanation is the postural instability theory and the importance of the

vestibular system in maintaining a stable posture and minimizing swaying.<sup>[3]</sup>

Motion sickness susceptibility is important for research related to motion sickness for two reasons. Firstly, repeating and understanding research results depends upon who the subjects were, and some means to identify the susceptibility of those serving as subjects is therefore important. Second, there is often a desire to screen out subjects who are particularly susceptible because getting people sick is sometimes a consequence to be avoided. The original standard questionnaire for this is Reason and Brand (1975) Motion Sickness Susceptibility Questionnaire (MSSQ). Golding (1998) describes research to improve that standard questionnaire, but only found moderate correlations between MSSQ scores with sickness tolerance to laboratory motion devices ( $r=0.45$ ). Golding (2006) examined individual differences using a short version of the Motion Sickness Susceptibility. The short form was developed by removing items with low sickness prevalence such as wide screen movies and virtual reality. It was found to be a reliable and valid alternative to the long form.<sup>[2]</sup> Motion sickness susceptibility questionnaire (MSSQ) predict individual differences in motion sickness caused by a variety of stimuli.<sup>[4]</sup>

India is diverse nation with varying cultures and languages. Marathi is the language that is spoken widely along the western coastal region in the state of Maharashtra. However, English serves as a barrier in the state where Marathi is the prime language.<sup>[5]</sup> Hence, the MSSQ short form needs to be translated into Marathi for the ease of its use.

The translation and cultural adaptation of instruments is an internationally recognized and valid method. The process involves translation of instrument from one language to another, synthesis, back translation, expert committee review to finalise the pilot testing, pretesting, feedback, and psychometric evaluation.<sup>[5]</sup>

Therefore, the present study had two objectives. In the first phase, cultural adaptation and translation of the MSSQ short form into Marathi were performed. In the second phase, preliminary assessment of the reliability was conducted for the final version of the MSSQ short form Marathi (MSSQ-M) in patients with Motion Sickness.

## Materials and Method

After seeking permission from the Institutional Research Review Committee, the study was conducted in two phases.

Phase 1 involved translating the original MSSQ into Marathi using forward-backward translation process given by WHO.

Stage I: Initial translation- The first stage in adaptation is the forward translation. Two forward translations were made from the original language (English) to the target language (Marathi). In this way, the translation was compared for discrepancies. It is necessary for the bilingual translators to have the target language as their mother tongue. Discrepancies was then discussed and resolved with unbiased bilingual translator who was not involved in previous translation.

Stage II: Backward translation- Totally blind to the original version, a translator then translated the MSSQ short form of Marathi back into the original language (English). This is a process of validity checking to make sure that the translated version is reflecting the same item content as the original versions.

Stage III: Expert Committee Review- The composition of this committee is crucial to achievement of cross-cultural equivalence. The committee consisted of translators and two senior physiotherapists. Committee reviewed all the translation and reached a consensus on discrepancies. This formed the prefinal version.

Stage IV: Preliminary Pilot Testing- A group of 10 students with Motion sickness were selected for pretesting the prefinal version. These students spoke and understood both English and Marathi language equally well. Each of them were given the translated MSSQ-M and MSSQ English. They were also asked for their general comments on the questionnaire.

Phase 2 consisted of testing the reliability of the MSSQ-M.

A study population of 30 participants, age group between 7-12 years, with motion sickness participated in the study. Patients not experiencing motion sickness and not willing to participate were excluded. To assess the test-retest reliability MSSQ-M was administered twice, the repeat administration being after 2 weeks in order to minimize the clinical and cognitive changes.

**OUTCOME MEASURE**

Motion sickness susceptibility questionnaire-short form

**STATISTICAL ANALYSIS**

Test-retest reliability was tested in a test-retest design and was evaluated using the intra-class correlation coefficient (ICC). The ICC was interpreted as follows: <0.40, poor reliability; 0.40-0.75, moderate reliability; 0.75-0.90, substantial reliability; and >0.90, excellent reliability. The internal consistency was evaluated by cronbach's  $\alpha$  coefficient, which is considered statistically significant when between 0.70 and 0.95.

**Results**

The study included a total of 30 participants with 13 boys and 17 girls with a mean age of 10.3 years ( $SD=\pm 1.39$ ). MSSQ was successfully translated in Marathi version using forward-backward translation. It took 30 days to complete a culturally adapted version. At the end of the pilot study, results showed that the patients understood the meaning of all questions properly. After an exact translation process, the Marathi version MSSQ short form was found to exhibit face validity.

The reliability was tested by measuring internal consistency and test-retest method. The Cronbach's alpha for MSSQ = 0.94 with 95% confidence interval. Correlation between MSSQ-M on day 1 and day 15 were highly significant. The intraclass coefficient was 0.8 with 95% confidence interval.

**Discussion**

This is the first study to translate, culturally adapt, and validate the MSSQ for Marathi speaking patients with motion sickness. The translation and cross-cultural adaptation of the MSSQ-M was successfully carried out by the guidelines given by WHO. The pilot testing showed us that all the translated questions were properly understood without any difficulties. Hence, it was finalized without the need for any modifications.

MSSQ-M was further administered on 30 participants to assess the reliability of the questionnaire. A good internal consistency (0.94) was found for MSSQ-M which is consistent with other reports. Our findings are in line with the Thai (MSSQ-T 0.80). MSSQ-M demonstrated good test-retest reliability when the instrument was administered to participants 2

weeks apart. The ICC scores fell within the substantial reliability range of 0.75-0.90. Test-retest reliability was found to be ( $r=0.9$ ) that indicates it is highly significant correlation between results of MSSQ obtained on day 1 and day 15.

The limitation of the study was that it being a cross-sectional study and no physical assessment tests were included.

**Conclusion**

This study showed that the MSSQ-M is cross-culturally adapted and is reliable questionnaire. This newly formulated questionnaire can be used to determine the motion sickness susceptibility in paediatric population. It is easy to administer and can be recommended for use in routine clinical practice in Marathi-speaking population.

**Conflict of Interest :** Nil

**Source of Funding:** Self

**Ethical Clearance:** Institutional Research Review Committee of Department of Physiotherapy , Tilak Maharashtra Vidyapeeth, Pune.

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