# Cross-cultural adaptation and psychometric evaluation of a Sinhalese version of the *Multidimensional Scale of Perceived Social Support* (*MSPSS*) in patients with cancer

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## ABSTRACT

**Introduction:** The *Multidimensional Scale of Perceived Social Support (MSPSS)* is a tool widely used in health surveys to assess social support (SS) perceived by individuals. The lack of an appropriate tool to measure SS perceived by patients with cancer has hindered our understanding of how SS is associated with the management and recovery process of Sri Lankan patients with cancer. The study aimed to examine the reliability and validity of the Sinhalese version of the *MSPSS.*

**Methods**: Cross-cultural adaptation of the *MSPSS* was done following the standard guidelines of the process of translation and adaptation set by the World Health Organization. The study sample consisted of 40 patients with cancer at the Teaching Hospital Karapitiya, Galle, Sri Lanka. Data analysis was done using *SPSS* 25.0. Internal consistency of the overall *MSPSS* was calculated using Cronbach's alpha. Test-retest reliability of the tool was also assessed using the intra-class correlation coefficient (ICC). The convergent and divergent validity of the tool was assessed using the Centre for Epidemiological Studies-Depression (CES-D) and the World Health Organization-Quality of Life-Brief Scale (WHOQoL-BREF). Construct validity was assessed using Exploratory Factor Analysis (EFA).

**Results**: The Sinhalese version of *MSPSS* showed high reliability (Cronbach's alpha-0.911). The tool showed favourable test-retest reliability (ICC=0.91). The overall *MSPSS* score was correlated negatively with depressive symptoms (r= -0.459, $p<0.001$) and positively with dimensions of quality-of-life scores; overall (r=0.674, $p<0.001$), physical (r=0.426, $p<0.001$), psychological (r=0.540, $p<0.001$), social (r=0.674, $p<0.001$) and environmental quality of life (r=0.767, $p<0.001$) ensuring strong discriminant/divergent and convergent validity of the Sinhalese version of the *MSPSS.* Factor analysis extracted three factors (e.g., family, friends, and significant others) explaining 96.65% of the variance.

**Conclusion**: The Sinhalese version of *MSPSS* is a reliable and valid tool to assess the perceived SS from family, friends, or significant others among patients with cancer.

**Keywords:** *Cancer, MSPSS, reliability, social support, validity.*

## Introduction

Malignancy is one of the leading causes of death and accounts for more fatalities than other non-communicable diseases (1,2). The patterns of cancer occurrence in Sri Lanka are similar to that in the developed countries (3). Cancer patients worldwide endure many difficulties including impaired quality of life (QoL). However, sophisticated cancer treatment strategies lead to recovery and lengthening years of life but are associated with complications (1, 2). According to the literature, a major challenge that cancer patients have experienced across the globe is a lack of social support.

Social support (SS) is a complex, multi-dimensional construct where different aspects of social interactions namely social network, occupation, emotional support (*e.g*., empathy), instrumental support, and informational support (*e.g.* advice) are involved (4-6). The social support groups include family members, people around (*e.g*. relatives, friends), and healthcare teams (e.g., doctors, nurses, social service experts, psychologists) (7). SS acts as a coping method and buffers psychological distress and stressful life events (4, 5, 7, 8). It helps to relieve psychological reactions such as hopelessness and depression, decreases the harmful effects of negative events in life on physical QoL, and facilitates the emotional well-being of cancer patients (7). It also reduces the occurrence of physical symptoms (5) and helps to reduce the psychological burden (5, 9).

The *MSPSS* has grown as one of the most extensively used SS outcome measures, which was developed initially to measure SS in American adolescents (10). Over the years, the *MSPSS* has been translated and adapted into multi-cultural settings/countries (*e.g*. Thailand, Malaysia, etc.) (9-13) and it has been used with diverse populations (adolescents and adults) in different countries (9-14) and was found to have good reliability and validity (15, 16). The original *MSPSS* reported a high internal consistency for the three-factor structure: Family (FA), Friends (FR), and Significant others (SO) were 0.87, 0.85, and 0.91, respectively. The entire scale exhibited a Cronbach's alpha of 0.88, stability over 03 months from the first administration and moderate construct validity. Further, SS scores were found to be negatively correlated to anxiety ($r=-0.18$, $p<0.001$) and depression ($r=-0.24$, $p<0.001$) (10).

*MSPSS* has demonstrated satisfactory internal consistency and test-retest reliability with a Cronbach's alpha of 0.81 to 0.98 in non-clinical samples (e.g., adolescent disaster survivors, nurses, and university students) (9, 10, 17). It also has demonstrated, 0.92 to 0.94 in clinical samples (e.g., psychiatric, and cardiac patients) (16, 18). Only a few studies were found to have a "significant others" factor being added to the family factor resulting in a two-factor structure (19, 20). Further, some Asian studies (e.g., Turkey and Thailand) had reported a one-factor structure (12, 14, 16) due to the difficulty to differentiate between support provided by FA, FR, and SO. This might be due to the differences in cultural and linguistic changes.

Data on SS and the impact of SS on patients with cancer are scarce in the Sri Lankan setting. According to the previous publication by us, cancer patients had obtained higher family support (21) and family support was one of the significant predictors of QoL among patients with cancer (21, 22). According to the findings of patients with cancer in the Sri Lankan context, some had reported a high prevalence of psychological distress (21) and clinical depression (23) which could be reduced by providing SS. A few studies had reported SS on different clinical and non-clinical samples (e.g., patients with chronic kidney disease (CKD), elders, etc.) (24). The study with CKD patients found that those patients with poor SS led to lower levels of satisfaction and high level of psychological distress among them. A review article on Sri Lankan elders reports that novel changes such as urbanization, migration, and westernization have caused changes in traditional and cultural systems (25). We found only a few SS scales such as the short form of social support (SSQ6) have been validated for our population.

Therefore, assessment of SS among patients with cancer is vital in planning cancer care management. One of the major reasons for the absence of proper assessment of SS in cancer could be the unavailability of an appropriate tool to measure it. SS is given to cancer patients in Sri Lankan cultural traditions even though it is not quantified (25). Additionally, identifying SS and its outcome is important to make appropriate policy decisions to support those who are in need, and identifying gaps in SS is important to take measures to fill

them; both would also be advantageous to all healthcare professionals working in high-demand environments.

As the number of patients with cancer in the country is on the rise, having a reliable measure to identify patients' SS status/needs would be helpful for healthcare providers to deliver efficient service. If this instrument could be reliably used to assess SS among patients with cancer in a clinical environment, it would give an accurate picture of each patient's experience and sources of support from different stakeholders. A trustworthy, accurate, and user-friendly tool would be more crucial when considering the different sensory modalities that cancer patients experiences, such as pain, discomfort, and fatigue. Preparation of such a tool with all these features would be beneficial. Therefore, the purpose of this study was to evaluate the validity and reliability of a Sinhalese version of the *MSPSS* in Sri Lankan patients with cancer. The Sinhala language is used in the current study since Sinhala is the most widely spoken language in our country.

## Methods

### Study design and setting

This cross-sectional validation study was conducted at the Radiotherapy unit/ Oncology ward at Teaching Hospital Karapitiya (THK), Galle in Southern Sri Lanka.

### Study sample/participants

A sample of 40 patients with cancer was recruited using their appointment register. A convenience sampling method was used. Consecutive patients who registered at the Radiotherapy unit and who fulfilled the inclusion criteria were recruited by the principal investigator (PI). Being diagnosed with any type of cancer, awaiting radiotherapy, being able to communicate well in the Sinhala language, and being willing to provide informed consent with sufficient physical and mental stability were inclusion criteria of this study. Cancer patients with any surgical problems except cancer-related problems and those who were in a critical state or end-stage were excluded from the study.

Participation in the study was completely voluntary. Consent to participate in the study was obtained via written informed consent forms from all individual participants included in the study. Further, they were informed that they could withdraw from the study at any time without giving any reason.

The sample size was calculated using the following formula ($N = [(Z\alpha+Z\beta)/C]^2 + 3$) (26), the correlation coefficient value for this sample calculation was considered 0.45. A cross-sectional study conducted in China on the effects of social support, hope, and resilience on quality of life among Chinese bladder cancer patients found that the correlation between social support and functional well-being was 0.419. Thus, we used r as 0.45 to calculate the sample size. The calculated sample size was 36 and adding 10% for the non-respondents, the final sample size was 40 (26). Radiotherapy is given to a limited number of cancer patients. Many such patients were not in a physical or mental state that would not allow them to participate in this study. However, we were able to enroll enough patients who planned for radiotherapy treatment for this study. Further, we had to make sure that the consented participants have a higher chance of participating in the test-retest procedure.

### Study measures

Sinhalese version of *MSPSS* and previously validated two scales; Centre for Epidemiological Studies - Depression (CES-D) (27), and the World Health Organization-Quality of Life - Brief Scale (WHOQOL-BREF) (28) were administered among the selected forty cancer patients.

The *MSPSS* (10) is a 12-item, self-administered tool that was developed to measure the perceived adequacy of social support from three sources: family members (FA) (items 3, 4, 8, and 11), friends (FR) (items 6, 7, 9, and 12), and other significant people (SO - significant other/person who is very significant and close to the patient like boy/girlfriend, teacher, or counselor) (items 1, 2, 5, and 10); this instrument is brief yet, comprehensive and easy to understand. Ratings of these 12 items were prepared on a 7-point Likert-type scale ranging from very strongly disagree (1) to very strongly agree (7); the higher/ lower score corresponds to greater/lower perceived social support. The developed final Sinhalese version of the *MSPSS* scale was used for the study.

The CES-D (27) is a 20-item, short, self-reported scale, originally designed to measure depressive symptomatology in the general population globally (29) during the 'previous week' of the affected person's life. Each question has 04 responses from 0 (rarely or none of the time) to 3 (most or all of the time). The total score of the CES-D scale ranges from 0 (no depressive symptoms) to 60 (high level of depressive symptoms), where higher scores indicate the presence of more depressive symptomatology. The Sinhala translation is a validated scale in the Sri Lankan context (29, 30).

The WHOQoL-BREF (28) is a 26-item scale that includes 04 domains; physical, psychological, social, and environmental, and was originally developed to measure the QoL. The higher scores represented a higher level of self-perceived QoL. The scale WHOQoL-BREF Sinhala version has been validated in the Sri Lankan setting (21-23).

An interviewer-administered questionnaire and the diagnosis cards of the participants were used to obtain socio-demographic data and clinical characteristics. Participants completed the validated Sinhala versions of CES-D, and WHOQoL-BREF and the Sinhala version of *MSPSS*, Translation and validation procedure

This study is mainly comprised of two phases. An original English version of the *MSPSS* was used for this study after obtaining permission from the developer. Instructions of a systematic method for cross-cultural adaptation guidelines were followed according to Beaten *et al.,* (31) and World Health Organization (WHO) (32). First, the original English version of *MSPSS* was translated into Sinhala language (forward translation) individually by three experts fluent in both English and Sinhala language. The multidisciplinary expert panel consisted of a community health expert, a clinician, a clinical psychologist, and a nursing professional who was involved in evaluating the items of the tool. The modified version was then back-translated into the English language by three independent bilingual translators. Further, the expert committee reviewed both forward and backward translations and the original version; then preliminary version was developed. Guaranteed clarity, ambiguity, and understandability of items in the questionnaire.

Cognitive interviews were conducted and pre-tested with ten cancer patients as per the guidelines; a few words were simplified to make it easier for the patients to understand according to cultural appropriateness. The pre-final Sinhala version of the *MSPSS* was developed as the above-mentioned procedures. Finally, content validity was confirmed by the panel of content experts; the final Sinhala version of *MSPSS* was prepared to ensure the face and consensual validity too by the multidisciplinary panel of experts. No modifications were made to fit the items of the scale with the concept of Sri Lankan culture.

**Data analysis**

Data analysis was done using *Statistical Package for the Social Sciences* (*SPSS*™) 25.0 (IBM Statistics, Inc., Chicago). All results were considered statistically significant at $p<0.05$. Socio-demographic variables and scores of tools were described with descriptive statistics. Correlation coefficient values between 0.10 and 0.29 were considered weak, between 0.30 and 0.49 were considered moderate, and between 0.50 and 1.00 were considered strong and had a very high correlation (33).

The reliability of the *MSPSS* was evaluated using Cronbach's alpha for an overall score of SS and subscales considering the accepted standard cut-off for internal consistency as 0.60 or above (9, 34); considered as satisfactory internal consistency. The test-retest reliability was assessed using the intra-class correlation coefficient (ICC) using the scores of scales in baseline and subsequent administrations; after 02 weeks of first administration by the PI among the same 40 cancer patients.

Appraising criterion validity of the *MSPSS* was done by assessing the concurrent, convergent, and discriminant/ divergent validity methods. Concurrent validity was assessed with two standard scales the CES-D and the WHOQoL-BREF. Convergent validity was assessed by item-subscale correlation considering a higher correlation of each item with their respective subscale. Further, both WHOQoL-BREF and CES-D scales were used to measure convergent and discriminant/ divergent validity (using Pearson correlation) and hypothesised that individuals who have less SS tend to have impaired QoL and higher depressive symptoms (discriminant/divergent validity).

It was decided to carry out exploratory factor analysis (EFA) to check the factorial/ construct validity of the *MSPSS*; it was done with the Varimax rotation method (to decide whether the latent item structure reflected the three subscales specified in the instrument construction).

Bartlett's Test of Sphericity should reach statistical significance ($p<0.001$) and Commonalities Coefficients should be high (>0.6) (33). The number of extracted components were determined by the Scree plot, the percentage of variance explained by each component, the number of Eigenvalues over one (Kaiser-Guttman rule), and consideration of prior psychometric *MSPSS* analysis. Items were considered representative of a component if their item loading was ≥ 0.40 and in the cross-loading items, the factor, which had a higher loading value, was taken as the respective factor (33).

All possible actions were performed to ensure the quality of data obtained while collecting information. Only the PI was involved in data collection. All subjects were informed of the purpose of the study, the nature of the study, and the fact that the data collected would be confidential and accessible only to the PI. Data entry and re-checking were done by the PI.

Ethical approval for the study was obtained from the Ethics Review Committee, the Faculty of Medicine, and the University of Ruhuna. In addition, permission was granted by the Director of TH Karapitiya, relevant Consultants, and Sisters/ In-Charges to conduct this research in the Oncology ward.

## Results

*Sample description*

The mean (±SD) age of the sample was 61.03(±11.70) years. The age of the participants ranged from 35 to 88 years (Table 1). The mean (±SD) score for overall *MSPSS* was 64.90(±7.33). The Mean (±SD) subscale scores were FA; 23.68(±3.02), FR; 20.67(±6.25) and SO; 23.65(±3.06). The mean (±SD) *MSPSS* scores of individual items are shown in Table 2.

*Cross-cultural adaptation of the MSPSS*

The synthesis versions were created by PI following the established guidelines, and both translated versions showed strong agreement with the original English version. The final Sinhalese version of the *MSPSS* was prepared after incorporating all clarifications comprehensively and legibly. It took about 10-12 minutes for the participant to fill out *MSPSS*. The response rate of the sample was 100%.

*Reliability of the Sinhalese version of the MSPSS scale*

*MSPSS* showed high reliability with Cronbach's alpha of 0.911 (overall 12 items), and three subscales: FA, FR, and SO: 0.983, 0.931, and 0.996 respectively indicating excellent reliability. The item-total correlation ranged from 0.534 to 0.789 ($p<0.001$).

Test-retest reliability measured with ICC between 1st and subsequent administration of *MSPSS* score was 0.91 (95% CI= 0.86-0.95, $p<0.001$). Subscale scores also reported higher ICC; FA: ICC= 0.98, 95% CI= 0.97-0.99, $p<0.001$, FR: ICC= 0.93, 95% CI= 0.89-0.96, $p<0.001$, SO: ICC= 0.99, 95% CI= 0.98-0.99, $p<0.001$. These values also reported excellent test-retest reliability.

*Psychometric evaluation of the Sinhalese version of the MSPSS scale*

*Criterion validity*

In the item-subscale correlation analysis, items correlated with their subscale well (FA - r ranged from 0.94 - 0.99, $p<0.001$) (FR - r ranged from 0.90 - 0.93, $p<0.001$), (SO- r ranged from 0.97 - 0.99, $p<0.001$) than with other subscales such as FA vs. FR and FR vs. SO as in Table 3, reporting higher convergence of items with their respective subscales (Table 3). Further, all subscales showed a stronger correlation with the total *MSPSS* (r - range from 0.80 - 0.82, $p<0.001$).

Overall WHOQoL-BREF score, and subscales' scores (e.g., dimensions-physical, psychological, social, and environmental) were positively and significantly correlated with the overall *MSPSS* score (convergent validity) ($p<0.001$), while the score of the CES-D scale was negatively and

**Table 1:** Socio-demographic and Clinical Characteristics of Participants (N=40)

| Characteristics | Categories | N (%) |
|---|---|---|
| Age | < 60 Years | 20 (50.0) |
| | > 60 Years | 20 (50.0) |
| Gender | Male | 21 (52.5) |
| | Female | 19 (47.5) |
| Marital status | Married | 35 (87.5) |
| | Unmarried/ single | 5 (12.5) |
| Educational status | No schooling | 5 (12.5) |
| | Primary education (Grade 1-5) | 9 (22.5) |
| | Secondary education (Grade 6-12) | 26 (65.0) |
| Employment status | Employed | 30 (75.0) |
| | Unemployed | 10 (25.0) |
| Primary/Secondary site of the cancer | Head & Neck | 2 (5.0) |
| | Gastrointestinal organs | 12 (30.0) |
| | Lungs | 1 (2.5) |
| | Bones | 3 (7.5) |
| | Breast | 3 (7.5) |
| | Prostate | 1 (2.5) |
| | Lymph nodes | 3 (7.5) |
| | Unknown | 15 (37.5) |
| Time since diagnosis | < 12 months | 8 (20.0) |
| | > 12 months | 32 (80.0) |

N(%): Frequency and percentage of patients

**Table 2:** Item Descriptive Statistics of the *MSPSS*

| Item number | *MSPSS*-12 item | Mean ± SD |
|---|---|---|
| 1 | Need special person help | 5.90 ± 0.78 |
| 2 | Stay special person with me | 5.90 ± 0.78 |
| 3 | Family helps me | 5.93 ± 0.76 |
| 4 | Emotional support from family | 5.93 ± 0.76 |
| 5 | Special person as real source | 5.93 ± 0.76 |
| 6 | Really help from friend | 5.00 ± 1.71 |
| 7 | Fewer friends during problem | 5.55 ± 1.92 |
| 8 | Discuss with family members | 5.95 ± 0.75 |
| 9 | Stay friends always | 5.08 ± 1.65 |
| 10 | Special person in my life | 5.93 ± 0.76 |
| 11 | Family helps to take decisions | 5.88 ± 0.82 |
| 12 | Discuss problems with friends | 5.05 ± 1.57 |

*MSPSS: Multidimensional Scale of Perceived Social Support Scale*, SD: standard deviation.

**Table 3:** Item-subscale correlation of 12 items of *MSPSS*

| Item | Correlation Coefficient (r) | | | |
|---|---|---|---|---|
| | FA | FR | SO | Total *MSPSS* |
| 1 Need special person help | 0.98 | 0.35 | 0.99 | 0.82 |
| 2 Stay special person with me | 0.98 | 0.35 | 0.99 | 0.82 |
| 3 Family helps me | 0.99 | 0.33 | 0.97 | 0.80 |
| 4 Emotional supports from family | 0.99 | 0.33 | 0.97 | 0.80 |
| 5 Special person as real source | 0.98 | 0.30 | 0.99 | 0.78 |
| 6 Really help from friend | 0.44 | 0.93 | 0.44 | 0.85 |
| 7 Fewer friends during problem | 0.39 | 0.91 | 0.39 | 0.80 |
| 8 Discuss with family members | 0.99 | 0.28 | 0.97 | 0.77 |
| 9 Stay friends always | 0.13 | 0.91 | 0.14 | 0.65 |
| 10 Special person in my life | 0.98 | 0.30 | 0.99 | 0.78 |
| 11 Family helps to take decisions | 0.94 | 0.33 | 0.92 | 0.77 |
| 12 Discuss problems with friends | 0.20 | 0.90 | 0.21 | 0.69 |
| Total *MSPSS* | 0.81 | 0.82 | 0.81 | |

FA: Family sub scale; FR: Friends sub scale; *MSPSS: Multidimensional Scale of Perceived Social Support Scale* ; r: correlation coefficient; SO: Significant Others Subscale

**Table 4:** Bivariate correlation between *MSPSS*, CES-D and WHOQoL-BREF

| *MSPSS*-Total support | CES-D r | Overall QoL r | Domains of WHOQoL-BREF r | | | |
|---|---|---|---|---|---|---|
| | | | Physical | Psychological | Social | Environmental |
| | -0.46* | 0.67* | 0.44* | 0.54* | 0.67* | 0.77* |

CES-D: Centre for Epidemiological Studies - Depression scale; *MSPSS: Multidimensional Scale of Perceived Social Support Scale;* QoL: Quality of Life; r: correlation coefficient; WHOQoL-BREF: World Health Organization-Quality of Life-Brief $p<0.001^{*}$

*Exploratory factor analysis*

According to the correlation matrix, many coefficients had reported more than 0.3 (data not shown) and the KMO value was 0.76, and Bartlett's Test of Sphericity reached statistical significance supporting the factorability of the correlation matrix ($p$<0.001). Factor analysis revealed three factors as in the original scale (which confirmed the construct validity), with Eigenvalue exceeding 1 explaining a cumulative variance of 96.65% (factor 1; 69.18%, factor 2; 23.49%, and factor 3; 3.97%) (Table 5).

Items 1-5, 8, 10, and 11 which correspond to FA and SO subscales saturated into a single factor (factor 1) without cross-loading items. It was named 'Family' as in the original scale. Items 9 and 12 corresponded to the FR subscale saturated into a single factor (factor 2) with a considerable number of cross-loadings in FA and SO and named 'Friends' as in the original scale as those items represented the aspects of friends. Remaining items 6 and 7 which correspond to the FR subscale saturated into a factor 3, named SO as in the original scale (Table 5).

**Table 5:** Three factor structures of *MSPSS* after Varimax rotation

| Sub-scales and item (As in the original scale) | Items of *MSPSS* | Component extracted from factor analysis (r) | | |
|---|---|---|---|---|
| | | 1-FA | 2-FR | 3-SO |
| **Family (FA)** | 1 Need special person help | 0.97 | | |
| | 2 Stay special person with me | 0.97 | | |
| | 3 Family helps me | 0.97 | | |
| | 4 Emotional supports from family | 0.97 | | |
| | 5 Special person as real source | 0.98 | | |
| | 8 Discuss with family members | 0.98 | | |
| | 10 Special person in my life | 0.98 | | |
| | 11 Family helps to take decisions | 0.92 | | |
| **Friends (FR)** | 9 Stay friends always | | 0.95 | |
| | 12 Discuss problems with friends | | 0.95 | |
| **Significant others (SO)** | 6 Really help from friend | | | 0.77 |
| | 7 Fewer friends during problem | | | 0.84 |

FA-family sub scale; FR-friends sub scale; *MSPSS-Multidimensional Scale of Perceived Social Support Scale*; r-correlation coefficient; SO-significant Others Subscale.

## Discussion

The *MSPSS* was translated and culturally adapted to suit the Sri Lankan context. The present study is the first reported study to investigate the psychometric properties of *MSPSS* in patients with cancer in Sri Lanka. The *MSPSS* assessed emotional or informational, tangible, emotional support, and positive social interaction. The Sinhalese version of *MSPSS* showed excellent reliability and validity properties to measure SS perceived by patients with cancer in Sri Lanka. The findings are in line with the results of the previous studies. It is suitable for use as a 3-factor structure, as has been found in the original study (10) and other supporting studies in different countries with different languages (4, 9, 11, 13, 17, 33).

The overall reliability of the Sinhalese version of *MSPSS* was high and compatible. Wongpakaran, Wangpakaran, and Ruktrakul (16) found that for students the Cronbach's alpha/reliability of the overall scale was 0.91, and the reliabilities of sub-scales (FA, FR, and SO) were 0.83, 0.91, and 0.86 respectively for the patient group.

Further, the overall Cronbach's was 0.87 (patient group), with sub-scale scores of 0.85, 0.84, and 0.74 for FA, FR, and SO respectively in the Thai version of *MSPSS.*

A study by Dahlem, Zimet, and Walker (35) observed the overall reliability of the tool as 0.91 and sub-scales scores as 0.90, 0.94, and 0.95 for FA, FR, and SO respectively (35). The FA, FR and SO subscales of the Chinese version of the *MSPSS* study reported Cronbach's alpha of 0.88, 0.89, and 0.93 respectively for the Chinese parents' group of children with cerebral palsy; for the mothers, the reliability of these three subscales was 0.86, 0.88, and 0.89, respectively; for the fathers, the reliability of these three subscales was 0.90, 0.88, and 0.90, respectively (13). The Malaysian version of *MSPSS* has also shown (36) that it is a reliable tool with overall scale alpha of 0.92. The Tamil version of *MSPSS* also had greater reliability (ICC 0.91) and higher Cronbach's alpha for three subscales (FA-0.89, FR-0.91, SO-0.86) (4).

The lowest reliabilities were observed in the two Malay versions done for the medical and university students (15, 37) in contrast to our study.

This tool is reliable across different population groups including the current study which demonstrates that the tool behaves similarly in any subject/diverse samples. Generally, support from FA, FR, and SO may deliver emotional strength to better adaption and adjustment to new places and new cultures. However, experiencing a disease like cancer could create more emotional pressure, which requires the use of several different strategies. Subjects who perceived more SS experienced less difficulty in maintaining their family relationships generally (4, 9, 25). Another reason that could have been reported for these results like increased SS may have been cultural. In Chinese familism plays a big role in Chinese social structure and it would impact every family member's life like in our society. FA, FR, and SO would have more similar constructs according to some cultures like China, Malaysia, Sri Lanka, etc. Also, this might have been caused by how our participants interpreted the item's content when they were experiencing different issues and problems (4, 9, 25). In our study, participants were able to differentiate among the three sources of support identified in the *MSPSS*. In the assessment of perceived social support, FA, FR, and SO are important aspects to be considered. In addition, high test-retest reliability scores indicated the excellent reliability of the scale in the current study which is in line with previous studies (16).

*MSPSS* has shown convergent and discriminant/ divergent validity as it demonstrated that SS has a significant association with QoL and depressive symptoms as we expected. Similarly, the Thai version of *MSPSS* (16) has shown that *MSPSS* is associated with anxiety, depression, and self-esteem and the Spain version of *MSPSS* has shown that SS is associated with the Satisfaction with Life Scale as well (11). This indicates that the Sinhalese version of *MSPSS* can be reliably used for the assessment of SS in cancer patients.

The culturally acceptable Sinhalese version of *MSPSS* demonstrated acceptable factorial validity like previous reports which showed a 3-factor model in different language versions including English, Thai, Malaysian, Greek, and Spanish (4, 11, 16, 17, 35, 36, 38). Therefore, this tool behaves similarly in many cultures, and it directly provides the view of SS in cancer patients, indicating the stability of the tool in different settings. In contrast to the current study, a few studies such as versions of Stanley *et al.,* (39) and Chou (19) have proposed a 2-factor model in the *MSPSS,* and further a single-factor model (20). This might be related to the language differences among the different regions.

*MSPSS* required only ten minutes to complete and is sufficiently sensitive to measure the SS of cancer patients. Therefore, this validated Sinhalese version of *MSPSS* can be used in both community and clinical settings for rapid assessment of SS and making necessary recommendations to enhance the SS of cancer patients. Further, *MSPSS* is applicable as a generic tool that can be administered for different population groups. It also can be administered by different categories of professionals such as nursing professionals, social workers, etc. making it suitable to explore social support services, future healthcare, etc. in the country.

There were some limitations as well. The sample size was comparatively small. Large sample sizes involving more heterogeneous cancer patients from different cultural backgrounds/ clinical settings would be helpful. The group included patients with cancer at different sites of the body and we did not consider cancer type or duration from diagnosis when analyzing the results. We only recruited Sinhala-speaking individuals from a hospital setting. Itwould have been more meaningful if the psychometric properties and factorial structure of the Sinhalese version of the *MSPSS* is studied on a larger population including those in other geographical locations and community settings. Such studies would lead to generalizable results. The availability of the Sinhalese version of *MSPSS* will help to develop/ enhance research in SS in cancer patients and researchers will benefit greatly from it. A self-reported questionnaire will be valued and significant in future studies because the interviewer-administered questionnaire can interfere with the patients' genuine expressions.

## Conclusions and recommendations

Our findings concluded that *MSPSS* is a multidimensional-construct instrument that can be used to assess social support. Furthermore, the

Sinhalese version of *MSPSS* is a valid and reliable tool to assess the social support of cancer patients in Sri Lanka. It may also be applicable for assessing the social support of patients having chronic diseases with long-term treatment needs like those suffering from cancer.

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