

# Validation of Sinhala Version of Brief COPE Scale in Patients with Cancer in Sri Lanka

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## Research Article

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# Abstract

**Background:** Coping strategies are essential in the cancer management/recovery process and play an integral role in patients with cancer globally. In Sri Lanka, validated scales to measure coping are scarce. This study examined the psychometric properties of the Sinhalese version of the Brief COPE.

**Methods:** This scale is self-administered (28 items) and consists of adaptive and maladaptive coping strategies divided into 14 subscales. Cancer patients were registered on a 'first come - first serve' basis using their appointment register at the Radiotherapy Unit, Oncology ward, Teaching Hospital, Karapitiya, Galle, Sri Lanka. They were requested to complete the Sinhalese version of the Brief COPE and demographic details. Test-retest reliability was checked using the same subjects two weeks later. Factorial validity was assessed using exploratory factor and principal component analysis. The results were regarded as statistically significant if  $p < 0.05$ .

**Results:** The mean ( $\pm$ SD) age of the sample was 61 ( $\pm$ 12) years. The mean adaptive coping ( $\pm$ SD) and maladaptive coping were 37.50 ( $\pm$ 8.14) and 17.10 ( $\pm$ 2.44), respectively. The internal consistency of the overall scale was good (Cronbach's alpha - 0.819). Adaptive and maladaptive coping showed a high Cronbach's alpha (0.861 and 0.396). The test-retest reliability was found to be 0.66. The Sinhala version of BC was found to have a negative correlation with the CES-D scale but was positively correlated with the WHOQOL-BREF questionnaire. Seven factors were extracted.

**Conclusion:** The Sinhala version of the Brief COPE is a valid and reliable tool to assess coping strategies among patients with cancer. The findings of this study will allow health authorities to gain an understanding of coping strategies among patients with cancer and the impact on cancer victims and family members to relieve their suffering.

## Background

Cancer is the second leading cause of death in the world, and similar trends have also been reported in Sri Lanka [1, 2]. Individuals diagnosed with incurable cancer face a life-threatening stressor and may react to stressful, unexpected circumstances such as the diagnosis of cancer differently, eliciting various coping responses [3]. 'Coping' is the process by which people manage stress or attempt to manage stressful demands (external or internal) [4, 5]. Distress, depression, anxiety, hopelessness, fear, and aggression have a great impact on cancer, as in the past literature [6, 7].

Cancer patients and family members should pay more attention to the psychological and social aspects of the patient to enable them to cope with the disease and its treatment [8]. It was found that more

personal and social resources were needed for the psychological and physical adjustment of breast cancer during that time for coping [6, 9, 10]. Studies have focused on different coping strategies among patients with several types of cancer; additionally, a variety of self-report tools have been used to assess coping strategies worldwide. Limited research has been done to measure coping strategies in cancer patients, and validated scales to measure coping are scarce in Sri Lanka compared to Western countries [11]. Carver et al. established that the full COPE comprises 60 items; to minimize the time taken to complete the scale, the Brief COPE scale (BC) was developed [10].

Assessing coping strategies in patients with cancer facilitates healthcare providers gaining insight into the impact of coping on cancer patients. Such an understanding is vital in making decisions about future care, different treatments, and managing complications faced by cancer patients and their family members, formal/informal caregivers, etc. Furthermore, a culturally adopted scale would be more important to any population group in Sri Lanka to assess their coping strategies and identify more favorable/healthy coping methods as well as minimize ineffective coping mechanisms such as substance use.

The purpose of this study was to examine the psychometric properties of the BC scale for patients with cancer treated at a tertiary care hospital in southern Sri Lanka.

## Methods

Cross-cultural adaptation guidelines were followed according to the instructions of Beaten et al. [12] and the World Health Organization (WHO) [13]: forward translation of the original version, expert panel discussion (e.g., oncologists, clinical psychologists, clinicians, professors in behavioral sciences, senior lectures in nursing), back-translation, pretesting, and cognitive interviewing. A preliminary version was developed after reviewing both forward and backward translation by the expert committee. Finally, a modified version of the BC was easily understood; the panel of content experts ensured the content validity of the scale. The final Sinhalese version of the Brief COPE (S-BC) scale [see additional file 1] was developed.

This BC scale has 28 items and contains 14 subscales with only two items on each scale, graded by a four-point Likert scale. The responses to the items were 1= 'I have not been doing this at all', 2= 'I have been doing this a little bit, 3= 'I have been doing this a medium amount' and 4= 'I have been doing this a lot. A higher score on the subscale indicates a higher likelihood that the coping methods were used by the respondents. Cronbach's alpha of the original BC was higher than 0.6 for 11 of the 14 subscales. The first eight subscales (16 items) were titled 'adaptive coping strategies', and the other six subscales (12 items) were named 'maladaptive coping strategies'[10]. A higher score indicates higher adaptive (score ranges from 0-48) and maladaptive coping (score ranges from 0-36). In terms of usage, Carver's scale has been widely used in different countries and has shown good psychometric properties [14 - 16].

The internal consistency/reliability of the S-BC was examined using Cronbach's alpha coefficient for an overall score of the S-BC and subscales considering the accepted standard cut-off for internal

consistency as 0.60 or above [17] and considered satisfactory internal consistency.

The test-retest reliability was examined using the intraclass correlation coefficient (ICC) using the scores of scales in the first and second administrations (administered the same questionnaire after two weeks of first administration among the same 40 cancer patients). Pearson's correlation coefficient was added to examine test-retest reliability.

Furthermore, Pearson's correlation coefficient was applied to check the concurrent validity of the S-BC scale and other standards scales (using correlations between the subscales themselves and the total score of the S-BC scale and standards scales). Convergent validity was assessed by item-subscale correlation considering a higher correlation of each item with their respective subscale. In addition, both the WHOQOL-BREF and CES-D scales were used to examine convergent validity, and discriminant/divergent validity assumed that participants who had higher coping used to have higher QoL and lower depressive symptoms; all applications were able to confirm the criterion validity of the scale.

The factorial validity of the S-BC was assessed using EFA. Factor analysis (FA) was performed using principal component analysis (PCA) with Varimax rotation (Kaiser normalization/Kaiser-Meyer – Olkin (KMO)). Bartlett's test of sphericity should reach statistical significance ( $p < 0.001$ ), and commonalities coefficients should be high ( $> 0.6$ ) [18].

The number of extracted components was determined by the Scree plot, percentage of variance explained by each component, number of eigenvalues over one (Kaiser-Guttman rule), and consideration of prior psychometric Brief COPE analysis. Items were considered representative of a component if their item loading was  $\geq 0.40$ , and in the cross-loading items, the factor that had a higher loading value was taken as the respective factor [19].

A total of 40 cancer patients at the Radiotherapy Unit, Oncology Ward, Teaching Hospital, Karapitiya (THK) in southern Sri Lanka were enrolled. Informed written consent was obtained from the patient before the data collection, and participation in the study was voluntary. The sample size was considered supposing the correlational coefficient was approximately 0.45 for the Brief COPE using the subsequent formula  $N = [(Z\alpha + Z\beta)/C]^2 + 3$ . The calculated sample size was 36, and adding 10% for the nonrespondents, the final sample size was 40 [19].

Baseline characteristics of the cancer patients were obtained using an interviewer-administered questionnaire and the diagnosis cards of the patients. The Centre for Epidemiological Studies – Depression scale (20 items- CES-D) [20] and the World Health Organization-Quality of Life - Brief scale (26 items- WHOQOL-BREF) [21] were administered along with the newly adopted S-BC scale among 40 cancer patients by the principal investigator. Participants were informed to complete the tools, the S-BC, CES-D, and WHOQOL-BREF, which were previously validated in the Sri Lankan context.

The CES-D is a 20-item, short and self-report scale that was originally developed to assess depressive symptomatology in the general population worldwide [20] during the 'past week'. Each question has 4 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. This scale was validated in the freely used Sri Lanka [22].

The WHOQOL-BREF is a 26-item scale comprised of 4 domains, physical, psychological, social, and environmental, and was originally developed to measure QoL [21]. Higher values indicated a higher level of QoL. The WHOQOL-BREF scale has been validated in the Sri Lankan setting and used freely in many studies [23].

Data analysis was performed using SPSS 25.0 (IBM statistics, Inc., Chicago). The level of significance was accepted at  $p < 0.05$ . Descriptive statistics were used to present the baseline characteristics of cancer patients. Correlation coefficient values between 0.10 and 0.29 were considered low, between 0.30 and 0.49 were considered medium, and between 0.50 and 1.00 were considered high and very strong [19].

Ethical approval was obtained from the Ethics Review Committee of the Faculty of Medicine, University of Ruhuna, and permission to recruit patients was obtained from the healthcare setting. For the scale validation process, permission was obtained from the original authors of Brief COPE.

## Results

Among 40 cancer patients, 53.0% ( $n=21$ ) were males, 88.0% were married and 75.0% were employed (Table 1). The mean ( $\pm$ SD) age of the sample was 61.03 ( $\pm$ 11.70) years. The mean ( $\pm$ SD) score of adaptive coping was 37.50 ( $\pm$ 8.14) and that of maladaptive coping was 17.10 ( $\pm$ 2.44), as shown below. The mean ( $\pm$ SD) S-Brief COPE scores of individual items are shown (Table 1). Regarding adaptive coping, the highest score was  $6.87 \pm 1.68$  for item-1 'Instrumental support'. As in the maladaptive scale, the highest score was  $5.08 \pm 1.40$  for item 1, 'Self-distraction'. The reliability of all subscales was checked, and the reliability scores of the S-BC scale ranged from 0.01 to 1.00 (Table 1). Due to the zero variance, three items were detached spontaneously from the reliability analysis (item 18-I have been making jokes about it, item 28-I have been making fun of the situation, item 3-I have been saying to myself "this is not real"). Then, 25 retained items were checked for reliability/internal consistency.

The reliability of the total/overall scale (25 items) was found to be good (Cronbach's alpha = 0.819); the reliability of the adaptive scale (14 items) and maladaptive scale (11 items) was 0.861 and 0.396, respectively.

In both phases, the adaptive and maladaptive subscales of the S-BC had high Cronbach's alpha values of 0.793 and 0.788, respectively. Test-retest reliability was higher for adaptive ( $r = 0.657, p < 0.01$ ) and maladaptive scales ( $r = 0.651, p < 0.01$ ). Test-retest reliability measured with ICC between the 1st and

subsequent administration of adaptive and maladaptive scores reported higher ICC; adaptive: ICC= 0.65, 95% CI= 0.43-0.80,  $p<0.001$ , maladaptive: ICC = 0.65, 95% CI= 0.42-0.79,  $p<0.001$ . These results suggest that the S-BC scale has acceptable reliability over time.

Adaptive coping was inversely correlated with CES-D scores (discriminant/divergent validity), whereas maladaptive coping was positively correlated with CES-D scores, which exhibited the convergent validity of the S-BC (Table 2).

Adaptive coping, total QoL, and four domains of the WHOQOL-BREF (theoretically related variables) were positively associated with each other, indicating convergent validity of the S-BC. Maladaptive coping was significantly and negatively correlated (discriminant/divergent validity) with the total QoL and physical and social QoL domains but not significantly associated with the psychological and environmental domains.

PCA revealed seven factors in contrast to the original scale, with eigenvalues exceeding 1 explaining a cumulative variance of 78.68% (factor 1; 24.97%, factor 2; 42.82%, factor 3; 52.13%, factor 4; 61.37%, factor 5; 67.37%; factor 6; 73.35%, factor 7; 78.68%) (Table 3; Figure 1). 1).

Without three items, all other items were included in the factor structure. However, as in the original taxonomy, 14 subscales were unable to fragment due to the loading patterns of each item [10]. The minimum item loading was 0.57 (8A Trying to get healed); 11th items were cross loaded on more than one factor in a significant figure (e.g., 12B, 6B, 8A, 3A, 2A, 1B, 7A, 8B, 1A, 11A and 7B).

Those cross-loaded items were included in one factor according to their higher loadings and the appropriate interpretation of the item. According to previous studies/conceptual scales and relevant explanations of the items, they were reassigned/included in subscales/7 subscales.

The 1<sup>st</sup> extracted factor was loaded by six items of five subscales of the original Brief COPE (denial, self-blame, positive reframing, substance use, and two items from the behavioral disengagement subscale). Overall, this factor can be named "avoidance and behavioral disengagement". The 2<sup>nd</sup> factor included the six items of four subscales (acceptance, planning, positive reframing, using instrumental support, and two items from religion) and can be constructed as "religion and acceptance". The 3<sup>rd</sup> factor consisted of self-distraction, acceptance, using emotional support, and instrumental support; these factors can be concluded as "seeking support" scales. The 4<sup>th</sup> factor consisted of the three items of three subscales (planning, active coping, and self-distraction subscales) and was named "Planning". The 5<sup>th</sup> factor corresponded to the substance use and venting subscale and can be constructed as the "Substance use and Venting" subscale. The 6<sup>th</sup> factor containing only one item of the self-blame subscale was named "Self-blame". The 7<sup>th</sup> factor consisted of venting, using emotional support, and active coping subscales and can be constructed as "active/positive coping". Among the seven factors, only four factors had fair Cronbach's alpha scores (Table 3), and the newly adopted structure resulted in a Cronbach's alpha of 0.57 (07-factor structure).

## Discussion

This study validated the Sinhalese BC scale in the Sri Lankan setting. Coping strategies that are used by patients with cancer have not received much attention in the Sri Lankan setting. Therefore, validation of the Brief COPE scale in the Sri Lankan setting is vital and imperative.

This study obtained good internal consistency and test-retest reliability of the S-BC when operationalized as two subscales. Cronbach's alpha of the overall scale was 0.819 but has not been shown in some studies [10, 24]. Adaptive coping had a high Cronbach's alpha of 0.861, whereas maladaptive coping had low reliability (0.396).

A high reliability coefficient for the subscales was not detected much throughout the current study, which contrasts with the results of others [10]. In our study, most of the subscales showed lower internal consistencies, whereas three subscales scored higher internal consistency: instrumental support (0.85), emotional support (0.70), religion (0.79), and behavioral disengagement (1.00). Acceptable internal consistencies were conveyed for most of the subscales elsewhere, especially in the original Brief COPE study [10, 24]. Nevertheless, others have reported better internal consistencies for maladaptive coping subscales [10], which is a difference from our results. Cronbach's alphas were tested for both phases; adaptive and maladaptive coping had better reliabilities ( $\alpha$ .785). Test-retest reliability was also high due to the homogeneity and stability of the scale over a two-week period (reliability of 2 major subscales =  $r$  .650,  $p < 0.01$ ).

Correlations between the S-Brief COPE, CES-D, and WHOQOL-BREF were performed to confirm the criterion validity of the scale. Correlation findings among S-BC, CES-D, and QoL presented reverse association: evidence of measuring different constructs or concepts. Similar construction among items in the subscale had a similar correlation (convergent validity). Different structures among different subscales or correlations of items and dissimilar subscales had lower correlations (discriminant/divergent validity). These were significant clues for high criterion validity between different subscales in the same tool.

Even though the factor structure of the scale has already been established, many studies have investigated it [24]. Seven factors were extracted from the EFA in the current study, and each subscale/item (25 items) was included in seven relevant factors collectively (avoidance/behavioral disengagement, religion/acceptance, seeking support, planning, substance use/venting, self-blame, active/positive coping). A similar number of factors was obtained by Hagan et al. [3] and labeled self-blame, acceptance, denial, emotional support, positive reframing, active, and behavioral disengagement. Due to the dissimilar constructions of extracted factors in the current study, one factor was made as to the independent factor and consisted of an item of the single subscale (6<sup>th</sup> factor -self-blame comprised with item 13 of the self-blame subscales), while some factors incorporated clusters of different subscales and created broader domains (3<sup>rd</sup> factor – seeking support contained with items of self-distraction, acceptance, using emotional support and instrumental support

subscales). These categories of broader dimensions and independent factors (e.g., religion, substance use, etc.) were also revealed in previous studies [24, 25]. These two studies established broader dimensions for some factors; the study of Kapsou et al. [24] had broader factors for 1 (active/positive coping), 4 (seeking support), etc. and 1 (problem-solving/acceptance), 2 (negative venting/avoidance), 4 (self-blame/denial), and 6 (humor/self-distraction) broader domains were comprised in the Su et al. [25] also in line with our results that we were able to progress broader dimensions such as 1 (avoidance/behavioral disengagement), 2 (religion/acceptance), and 5 (substance use/venting) in this study.

Furthermore, emotional and instrumental support subscales included one factor (seeking support), similar to others [24, 25]. Additionally, venting was loaded into the same factor in one study [25], whereas acceptance and self-distraction items were loaded into the 'seeking support' factor in our study. Religion, as an independent factor of the above two studies [24, 25], studies performance as a broader factor (religion and acceptance) and comprises different subscales, such as religion, acceptance, planning, positive reframing, and instrumental support.

Denial and self-blame subscales were clustered into the 4th factor (self-blame/denial) [25], whereas self-blame was extracted into the 1st (active/positive coping) and 8<sup>th</sup> factors (expression of negative feelings) of the study of Kapsou et al. [24]. Self-blame was loaded into the 1<sup>st</sup> factor, and the 6<sup>th</sup> factor and denial were extracted into the 1<sup>st</sup> factor in the present study. 'Substance use' was not a distinct factor in the study of Su et al. [25] but comprised the 'negative venting/avoidance' dimension. Independent factors were established for 'substance use' [25], whereas a broader dimension was established for substance use (substance use/venting) in our study.

Furthermore, most of the adaptive and maladaptive coping subscales had mixed up in the different studies and established new factors. However, new factors that are interrelated with adaptive coping (problem solving/acceptance, support seeking, reliance on spirituality, etc.) had been established in previous studies [24, 25] as comparable in this study (religion/acceptance, planning, active/positive coping, seeking support, etc.). Accordingly, the new factor structure had enough support for the original arrangement of the Brief COPE.

## **Conclusion**

The Sinhalese version of the Brief COPE scale was found to be a reliable and valid screening tool that can be used to measure coping strategies among patients with cancer in the Sri Lankan clinical setting. The findings of this study will allow health authorities to gain an understanding of coping strategies among patients with cancer and the impact on cancer victims and family members to relieve their suffering. Future research with higher numbers of participants and in different settings/languages will be recommended.

## **Abbreviations**

Brief COPE: Brief Coping; SD: Standard Deviation; CES-D: Centre for Epidemiological Studies–Depression scale; WHOQOL-BREF: World Health Organization-Quality of Life-Brief scale; BC; Brief COPE; WHO: World Health Organization; S-BC: Sinhalese version of Brief COPE; ICC: Intraclass correlation coefficient; EFA: Exploratory Factor Analysis; FA: Factor analysis; PCA: Principal component analysis; KMO: Kaiser-Meyer – Olkin; THK: Teaching Hospital Karapitiya; QoL: Quality of Life; SPSS: Statistical Package for the Social Sciences; CI: Confidence Interval

## **Declarations**

### **Acknowledgement**

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### **Authors' contributions**

EW conceived and designed the study as part of her MPhil thesis under the supervision of CS, MH and BP. EW reviewed the literature and collected the data. EW performed statistical analyses and prepared the first draft of the manuscript. CS, MH and BP contributed to the design of the study and the interpretation of the findings. BP guided and supervised the data collection and statistical analysis and supported the preparation of subsequent drafts of the manuscript. All authors critically revised the manuscript and contributed to the final draft. All authors have read and approved the final version of the manuscript.

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### **Availability of data and materials**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

### **Ethics approval and consent to participate**

Ethical approval for the study was obtained from the Ethics Review Committee, Faculty of Medicine, and the University of Ruhuna. Permission was granted from the Director of THK, Consultants, and Sisters/In-Charges to conduct this research in the Oncology ward, and informed written consent was obtained from all the participants included in the study during

the completion of the questionnaire, participants were able to ask questions. All participants read and offered signed informed consent before joining the study.

### **Consent for publication**

Not Applicable.

### **Competing interests**

The authors declare that they have no competing interests.

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## Tables

**Table 1** Characteristics of the study participants (N=40)

| Characteristics/variables                | 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)          |
| Education                                | No schooling                     | 5(12.5)          |
|  | Primary education (Grade 1-5)    | 9(22.5)          |
|  | Secondary education (Grade 6-12) | 26(65.0)         |
| Employment                               | Employed                         | 30(75.0)         |
|  | Unemployed                       | 10(25.0)         |
| Cancer types/locations                   | Head & Neck cancer               | 2(5.0)           |
|  | GI organs                        | 12(30.0)         |
|  | Lungs                            | 1(2.5)           |
|  | Bones                            | 3(7.5)           |
|  | Breast                           | 3(7.5)           |
|  | Prostate                         | 1(2.5)           |
|  | Lymph node                       | 3(7.5)           |
|  | Site unknown                     | 15(37.5)         |
|  | Time since diagnosis             | < 12 months      |
| ≥ 12 months                              |                                  | 32(80.0)         |
| Measurements                             | Cronbach's alpha (α)             | mean ±SD         |
| S-Brief COPE- <i>Adaptive coping</i>     | 0.861                            | 37.50±8.14       |
|  | Instrumental support (range 2-8) | 0.85 6.87±1.68   |
|  | Use of emotional support         | 0.70 6.68± 1.73  |
|  | Planning                         | 0.48 5.30± 1.80  |
|  | Active coping                    | 0.55 4.75± 1.69  |
|  | Religion                         | 0.79 4.65± 2.00  |
|  | Acceptance                       | 0.01 4.00± 1.03  |
|  | Positive reframing               | -0.07 3.25± 1.27 |
|  | Humor-                           | 2.00± 0.00       |
| S- Brief COPE- <i>Maladaptive coping</i> |                                  | 0.396 17.10±2.44 |
|  | Self-distraction (range 2-8)     | 0.20 5.08± 1.40  |
|  | Venting                          | 0.09 3.60± 1.21  |
|  | Substance use                    | 0.52 2.20± 0.56  |
|  | Self-blame-                      | 0.06 2.12± 0.51  |
|  | Denial-                          | 2.05± 0.31       |
|  | Behavioral disengagement         | 1.00 2.05± 0.31  |

N (%), frequency and percentage of patients; S- BC, Sinhalese Brief COPE scale; α, Cronbach's alpha.

**Table 2** Reliability and test-retest reliability of Brief COPE scale - phase 1 and 2

| Brief COPE scale         | Time phase 1 and phase 2 |                 |
|--------------------------|--------------------------|-----------------|
|                          | 1-2 Adaptive             | 1-2 Maladaptive |
| Cronbach's alpha         | 0.793                    | 0.788           |
| Inter-Item correlation   | 0.659                    | 0.651           |
| Test re-test reliability | 0.657**                  | 0.651**         |

p<0.01\*\*

**Table 3** Correlation between Brief COPE, CES-D, and WHOQOL-BREF

|                         | S-Brief COPE subscales |         |                    |        |      |
|-------------------------|------------------------|---------|--------------------|--------|------|
|                         | Adaptive coping        |         | Maladaptive coping |        |      |
|                         | r                      | p       | r                  | p      |      |
| CES-D                   | -0.362*                | <0.05   | 0.349*             | <0.05  |      |
| Total QoL               | 0.482**                | <0.01   | -0.041             | 0.80   |      |
| Domains of WHOQOL- BREF | Physical               | 0.506** | <0.01              | -0.117 | 0.47 |
|                         | Psychological          | 0.338*  | <0.05              | 0.040  | 0.80 |
|                         | Social                 | 0.328*  | <0.05              | -0.030 | 0.85 |
|                         | Environmental          | 0.415** | <0.01              | 0.029  | 0.85 |

r, correlation coefficient; CES-D, Centre for Epidemiological Studies- Depression scale; QoL, Quality of Life; WHOQOL-BREF, World Health Organization Quality of Life- Brief scale; p<0.05\* and p<0.01\*\*

**Table 4** Factor loadings and cross-loadings emerging from EFA of the Brief COPE

| Items  | F1    | F2    | F3    | F4    | F5    | F6    | F7    |
|--|-------|-------|-------|-------|-------|-------|-------|
| BI've been refusing to believe at it has happened.   | -.992 | -.049 | -.068 | -.059 | .003  | -.010 | -.170 |
| BI've been blaming myself for ngs that happened.   | -.992 | -.049 | -.068 | -.059 | .003  | -.010 | -.170 |
| BI've been giving up the tempt to cope.  | -.992 | -.049 | -.068 | -.059 | .003  | -.010 | -.170 |
| I've been looking for something good in what is ppening.   | -.992 | -.049 | -.068 | -.059 | .003  | -.010 | -.170 |
| AI've been giving up trying to al with it.   | -.992 | -.049 | -.068 | -.059 | .003  | -.010 | -.170 |
| BI've been using alcohol or ner drugs to help me get rough it.   | -.800 | -.271 | -.021 | -.134 | -.374 | -.172 | -.218 |
| I've been trying to find mfort in my religion or iritual beliefs.  | .200  | .858  | .089  | .390  | -.113 | .095  | .206  |
| I've been learning to live with  | .205  | .832  | .126  | .276  | .118  | -.038 | .191  |
| I've been thinking hard out what steps to take.  | -.214 | .741  | -.150 | .139  | .099  | .008  | -.077 |
| I've been praying or editating.  | -.009 | .662  | .209  | .535  | -.147 | .092  | .329  |
| I've been trying to see it in a ferent light, to make it seem ore positive.  | .202  | .658  | .136  | .592  | .125  | -.081 | .036  |
| I've been getting help and vice from other people.   | .332  | .574  | .448  | .362  | .050  | -.368 | .516  |
| I've been doing something to nk about it less, such as ing to movies, watching TV, ydreaming, sleeping, or opping. | -.101 | -.056 | .843  | .154  | -.096 | -.044 | .163  |
| I've been accepting the ality of the fact that it has ppened.  | .035  | .016  | -.779 | -.057 | -.019 | -.025 | .048  |
| I've been getting emotional pport from others.   | .443  | .229  | .677  | .217  | -.187 | .250  | .550  |
| I've been trying to get advice help from other people about at to do.  | .483  | .438  | .616  | .308  | .267  | -.174 | .412  |
| I've been concentrating my orts on doing something out the situation I'm in.                                       | -.024 | .319  | .131  | .910  | .044  | .093  | .123  |
| I've been turning to work or ner activities to take my mind e things.  | .162  | .206  | .172  | .862  | .088  | .150  | .036  |
| I've been trying to come up th a strategy about what to  | -.044 | .516  | .105  | .592  | -.317 | -.190 | .213  |
| A I've been using alcohol or ner drugs to make myself feel   | -.009 | -.387 | .165  | -.043 | -.685 | -.272 | -.203 |

|   |        |        |        |        |        |        |        |  |
|---|--------|--------|--------|--------|--------|--------|--------|--|
| ter.  |        |        |        |        |        |        |        |  |
| A I've been saying things to my unpleasant feelings       | .102   | .026   | .236   | .429   | .665   | -.265  | .199   |  |
| cape.   |        |        |        |        |        |        |        |  |
| A I've been criticizing myself.                           | .033   | -.005  | .046   | .180   | .032   | .782   | -.045  |  |
| B I've been expressing my negative feelings.              | .006   | -.294  | .053   | -.104  | .280   | -.181  | .660   |  |
| I've been getting comfort and understanding from someone. | .251   | .347   | .248   | .115   | .008   | .410   | .637   |  |
| I've been taking action to try make the situation better. | .364   | .476   | .036   | .480   | -.120  | -.125  | .593   |  |
| Eigenvalues   | 7.25   | 4.68   | 2.31   | 1.56   | 1.46   | 1.29   | 1.08   |  |
| Variance explained  | 29.01% | 47.77% | 57.04% | 63.31% | 69.16% | 74.33% | 78.68% |  |
| Cronbach's alpha  | 0.93   | 0.83   | 0.55   | 0.75   | -0.21  | None   | 0.31   |  |

Extraction and Rotation Method, PCA and Oblimin with Kaiser Normalization; F1, Avoidance/ Behavioral disengagement; F2, Religion/Acceptance; F3, Seeking support; F4, Planning; F5, Substance use/Venting; F6, Self-blame; F7, Active/positive coping; Bold figures, items with mostly similar factor loadings.

## Figures

### Figure 1

The scree plot – Brief COPE

## Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [Additionalfile1SinhaleseversionofBriefCOPE.pdf](#)