

RESEARCH

Open Access



Validation of the Arabic version of the Gratitude Questionnaire (GQ-4) in a sample of non-clinical adults

Feten Fekih-Romdhane^{1,2}, Álvaro Postigo³, Diana Malaeb⁴, Abir Sarray El Dine⁵, Mira Moawad⁶, Rabih Hallit^{7,8,9}, Sahar Obeid^{10*} and Souheil Hallit^{7,11,12}

Abstract

Background Although gratitude is a culturally-sensitive construct, it has yet received limited research attention in Arab countries, hence hindering the understanding of its features, correlates, and cross-cultural specificities. To fill this gap, we sought to examine the psychometric properties of an Arabic translation of the 6-item Gratitude Questionnaire (GQ) in an Arabic-speaking sample of adults from the general population of Lebanon.

Method We conducted a web-based survey including 601 participants (mean age 29.91 ± 12.61 , 62.7% females). The forward-backward translation method was used for the translation and adaptation of the GQ-6 into the Arabic language.

Results Findings indicated that a four-item version of the GQ achieved adequate fit statistics with the removal of the two reverse-scored third and sixth items. We found a McDonald Omega coefficient for the total 4-item GQ (GQ-4) scores of 0.88, thus attesting for the good reliability of the scale. Multiple-group Confirmatory Factor Analysis showed that the scale structure was invariant across male and female respondents at the configural, metric, and scalar levels. Females exhibited significantly higher gratitude scores compared to males. Finally, discriminant validity of the Arabic GQ-4 was evidenced through positive significant correlations with social support levels.

Conclusion The Arabic adaptation of the GQ showed good psychometric qualities, suggesting that it is suitable for measuring people's disposition toward gratitude in Arab backgrounds. Offering the Arabic GQ-4 as a brief, simple, cost-effective, valid, and reliable measure of gratitude to the Arabic-speaking community could help raise awareness about gratitude as a key component for achieving good mental health and wellbeing in Arab contexts.

Keywords Gratitude, CG-6, Arabic, Validation, Psychometric properties

Rabih Hallit, Sahar Obeid and Souheil Hallit are last coauthors.

*Correspondence:

Sahar Obeid
saharobeid23@hotmail.com

Full list of author information is available at the end of the article



© The Author(s) 2025. **Open Access** This article is licensed under a Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License, which permits any non-commercial use, sharing, distribution and reproduction in any medium or format, as long as you give appropriate credit to the original author(s) and the source, provide a link to the Creative Commons licence, and indicate if you modified the licensed material. You do not have permission under this licence to share adapted material derived from this article or parts of it. The images or other third party material in this article are included in the article's Creative Commons licence, unless indicated otherwise in a credit line to the material. If material is not included in the article's Creative Commons licence and your intended use is not permitted by statutory regulation or exceeds the permitted use, you will need to obtain permission directly from the copyright holder. To view a copy of this licence, visit <http://creativecommons.org/licenses/by-nc-nd/4.0/>.

Introduction

Gratitude has been considered for centuries as a universal moral virtue which is an integral part of humans' lives [1], and has gained a renewed research interest in recent years [2]. Gratitude refers to "a generalized tendency to recognize and respond with gratefulness to the role of other people's benevolence in the positive experiences and outcomes that one obtains" [1]. Gratitude may stem from sources outside the self that are either interpersonal (e.g., good intentions of a person providing some benefit or aid [3]), or non-interpersonal (e.g., feeling thankful for waking up in the morning [4]). There is strong empirical evidence to show that gratitude is linked to various positive psychology constructs, including well-being, life satisfaction, positive affect, prosocial behavior, forgiveness, happiness, and optimism [4–7]. A number of studies have also reported a positive association between gratitude and satisfactory social support and relationships [8–12]. Indeed, being grateful appears to be closely related to the propensity to form and maintain strong and close interpersonal bonds [8, 13], and engage in prosocial behaviors [9]. There are also other studies demonstrating that gratitude has inverse associations with depression, anxiety and stress symptoms [12, 14–19]. These numerous mental health benefits point to the potential relevance of the gratitude construct in a range of contexts, and suggests the importance of its assessment in clinical and research practice as a key component of mental health promotion strategy [20, 21].

At present, there exist several instruments to assess gratitude [22, 23]. However, the unifactorial Gratitude Questionnaire-Six Item Form (GQ-6 [1]), remains, to date, the most widely used measure. In the GQ-6, gratitude is conceptualized as an affective trait or a "disposition", thus putting forward its emotional component [1]. The scale consists of a self-report tool designed to evaluate individual differences in expressions and experiences of gratitude in everyday life [1]. The developers retained only six items from an initial pool of 39 items, which loaded onto a robust single factor and demonstrated adequate reliability and construct validity in young adult populations (older than 18) [1, 24].

Since its development, the GQ-6 has been translated and validated in several countries and languages, including Spanish (in Chile [25, 26], Ecuador [27], Venezuela [28], and Spain [29]), Greek [30], Italian [31], Polish [32], Dutch [33], Hungarian [34], Filipino [35, 36], Turkish [37], Brazilian Portuguese [38], Japanese [39], Chinese (in Taiwan [40] and China [41]), German [42], Vietnamese [43], Indonesian [44], Hindi [45], and Kenyan Kiswahili [46]. The GQ-6 has also been validated in different populations, such as Children/Adolescents [47], undergraduate students [29, 35, 37–40], and adults at Risk for Cardiovascular Disease [48]. Overall, these versions

revealed good internal consistency, convergent and discriminant validity as shown by significant correlations with relevant constructs, such as depression [25, 46, 48], anxiety, stress [45], well-being [30, 39, 42, 46], happiness [25, 31, 35, 40, 45], optimism [40], positive/negative affect [27, 47, 48], and satisfaction with life [29, 30, 37, 42, 43, 45, 47]. Although the majority of these validation studies confirmed the original single factor solution with six items [25, 33–35, 38, 39, 41, 49–51], some others rather demonstrated that a unidimensional five-item version (omitting the sixth item, i.e. "Long amounts of time can go by before I feel grateful to something or someone") yielded a good model fit (e.g. [25, 27, 29, 37, 40, 42, 45, 52, 53]). While other studies did support the original structure of the scale with an acceptable confirmatory factor analysis, issues were identified with the sixth item's factor loading [31, 33, 54]. Another study among Spanish students observed appropriate factor model results with an alternative that removed the fourth item (i.e. "I'm grateful to a wide variety of people") [52]. In a study performed among Chinese adults, it was decided to correlate the fourth and fifth item residuals in order to increase the fit indices of the unifactorial structure [41]. Another important psychometric quality of the GQ-6 is its consistently demonstrated reliability, with acceptable values found through both item–total correlations and Cronbach's Alpha coefficients (e.g. [26, 42, 52]). Also, reliability analyses revealed good internal consistency for a reduced five–item structure of the scale in Germany (Cronbach's $\alpha=0.82$) [42], Chile ($\alpha=0.726$) [55], Turkey ($\alpha=0.77$) [37], and Spain ($\alpha=0.77$) [52]. In addition, temporal stability was confirmed over a period of four weeks [39]. Measurement invariance of the GQ-6 across sex groups was also supported in different samples, including Chilean high school adolescents and adults [25], Filipino high school [36] and college students [35], Brazilian undergraduate students [38], Chinese students [41], Chilean adults and high school students [25]. Consistently, other studies have established the GQ-6 invariance in a reduced five–item structure across country [42] or sex [55] groups. Thus, the body of evidence available has supported the invariance of the GQ-6, suggesting that the scale can detect true differences in gratitude without the effects of some respondents' characteristics such as sex and country.

Since its development, the GQ-6 has been translated and validated in several countries and languages, including Spanish (in Chile [25, 26], Ecuador [27], Venezuela [28], and Spain [29]), Greek [30], Italian [31], Polish [32], Dutch [33], Hungarian [34], Filipino [35, 36], Turkish [37], Brazilian Portuguese [38], Japanese [39], Chinese (in Taiwan [40] and China [41]), German [42], Vietnamese [43], Indonesian [44], Hindi [45], and Kenyan Kiswahili [46]. The GQ-6 has also been validated in different

populations, such as Children/Adolescents [47], undergraduate students [29, 35, 37–40], and adults at Risk for Cardiovascular Disease [48]. Overall, these versions revealed good internal consistency, convergent and discriminant validity as shown by significant correlations with relevant constructs, such as depression [25, 46, 48], anxiety, stress [45], well-being [30, 39, 42, 46], happiness [25, 31, 35, 40, 45], optimism [40], positive/negative affect [27, 47, 48], and satisfaction with life [29, 30, 37, 42, 43, 45, 47]. Although the majority of these validation studies confirmed the original single factor solution with six items [25, 33–35, 38, 39, 41, 49–51], some others rather demonstrated that a unidimensional five-item version (omitting the sixth item, i.e. “Long amounts of time can go by before I feel grateful to something or someone”) yielded a good model fit (e.g. [25, 27, 29, 37, 40, 42, 45, 52, 53]). While other studies did support the original structure of the scale with an acceptable confirmatory factor analysis, issues were identified with the sixth item’s factor loading [31, 33, 54]. Another study among Spanish students observed appropriate factor model results with an alternative that removed the fourth item (i.e. “I’m grateful to a wide variety of people”) [52]. In a study performed among Chinese adults, it was decided to correlate the fourth and fifth item residuals in order to increase the fit indices of the unifactorial structure [41]. Another important psychometric quality of the GQ-6 is its consistently demonstrated reliability, with acceptable values found through both item–total correlations and Cronbach’s Alpha coefficients (e.g. [26, 42, 52]). Also, reliability analyses revealed good internal consistency for a reduced five–item structure of the scale in Germany (Cronbach’s $\alpha=0.82$) [42], Chile ($\alpha=0.726$) [55], Turkey ($\alpha=0.77$) [37], and Spain ($\alpha=0.77$) [52]. In addition, temporal stability was confirmed over a period of four weeks [39]. Measurement invariance of the GQ-6 across sex groups was also supported in different samples, including Chilean high school adolescents and adults [25], Filipino high school [36] and college students [35], Brazilian undergraduate students [38], Chinese students [41], Chilean adults and high school students [25]. Consistently, other studies have established the GQ-6 invariance in a reduced five–item structure across country [42] or sex [55] groups. Thus, the body of evidence available has supported the invariance of the GQ-6, suggesting that the scale can detect true differences in gratitude without the effects of some respondents’ characteristics such as sex and country.

To date, there is no validated Arabic measure assessing gratitude. In the present study, we proposed to adapt and validate the GQ-6 in an Arab context for several reasons. The GQ-6 has been designed and its psychometric properties have been widely verified in Western/Eastern settings and contexts, whereas its adaptability

in Arab cultural backgrounds is yet to be established. The GQ-6 has previously been used in a dearth of studies among people of Arab origin (e.g., Saudi Arabia [56, 57], Lebanon [58]) without any examination of its factorial structure or validity. Gratitude is expressed and practiced distinctly across cultures [59–63], and developmental pathways of gratitude have been found to differ across cultural groups [62]. For instance, gratitude seems to be more effective in promoting happiness in Western, individualist cultures compared to collectivist cultures [59]. These data suggest that gratitude might be not as universal as commonly assume. Thus, generalizations based on findings from Western developed societies should be avoided [63]. However, gratitude received limited research attention in Arab countries, hence hindering the understanding of its features, correlates, and cross-cultural specificities. Making available a validated Arabic gratitude measure would allow for testing the utility of gratitude practices and interventions, and promoting their usage in Arab settings. To this end, we sought to examine the psychometric properties of an Arabic translation of the GQ-6 in an Arabic-speaking sample of adults from the general population of Lebanon. We expected that the one-factor solution of the GQ-6 would be replicated through exploratory factor analysis (EFA) and confirmatory factor analysis (CFA). In addition, we expected that the Arabic GQ-6 will show good composite reliability, cross-gender invariance, and discriminant validity as indicated by significant correlations with measures of psychological distress and social support.

Methods

Participants and procedure

All data were collected in Lebanon via a Google Form link, between February and March 2023. After completing a training with the research team, five university students were asked to collect data via the snowball technique. They were asked to forward the link to people they know, who in turn were asked to forward the link to other family members and friends. Inclusion criteria for participation included being of a resident and citizen of Lebanon of adult age. Excluded were those who refused to fill out the questionnaire. Internet protocol (IP) addresses were examined to ensure that no participant took the survey more than once. After providing digital informed consent, participants were asked to complete the instruments described above. The survey was anonymous and participants completed the survey voluntarily and without remuneration [65].

Instruments

The Gratitude Questionnaire (GQ-6)

It is a 6-item self-report measure designed to quantify individual variances in the proneness to experience

gratitude in daily life. Items are rated on a 7-point Likert-type scale (where 1 = strongly disagree and 7 = strongly agree) [1]. The scale was translated to the official Arabic language, which is written and spoken across the Middle East and North Africa (MENA). The translation was performed with the purpose of achieving semantic equivalence between measures in their original and Arabic versions following international norms and recommendations [64]. To this end, the forward-backward translation approach was used. The English version was translated to Arabic by a Lebanese translator who was completely unrelated to the study. Afterwards, a Lebanese psychologist with a full working proficiency in English, translated the Arabic version back to English. The translation team ensured that any literal and/or specific translation was balanced. The initial and translated English versions were compared to detect/eliminate any inconsistencies and guarantee the accuracy of the translation by a committee of experts composed of the research team and the two translators [65]. An adaptation of the measure to the Arab context was performed, and sought to determine any misunderstanding of the items wording as well as the ease of items interpretation. Therefore, ensure the conceptual equivalence of the original and Arabic scales in both contexts [66]. After the translation and adaptation of the scale, a pilot study was done on 20 participants to ensure all questions were well understood. No changes were applied after the pilot study.

The depression anxiety and stress scales-8 (DASS-8)

Validated in Arabic, this scale is composed of eight items to assess total psychological distress, with three items evaluating depression, three items for anxiety and two items for stress [67]. The McDonald's omega value was 0.94 in this study.

The multidimensional social support scale (MSPSS)

This tool assesses individual perceptions of social support that emanates from three distinct sources: Family, Friends and a Significant Other. It is composed of 12 items, with higher scores reflecting stronger feelings of being socially supported [68]. We used the Arabic validated version of the MSPSS [69]. The McDonald's omega value was 0.96 in this study.

Data analysis

First, in order to study the factor structure of the scale, the sample was divided into two random subsamples: 1/3 for Exploratory Factor Analysis (EFA) and 2/3 for Confirmatory Factor Analysis (CFA). For the EFA (1/3, 201 participants), the KMO and Bartlett's statistic were used to study the adequacy of the data for the Factor Analysis. As it is a scale with seven response alternatives, the EFA was carried out on the Pearson correlation matrix

and Unweighted Least Squares (ULS) was used as the estimation method. The Measure of Sampling Adequacy [70] was used to study the adequacy of each of the items for the EFA, whose value must be greater than 0.50. The dimensionality of the instrument was determined through the optimal implementation of Parallel Analysis [71] with 100 random correlation matrices. In addition, the Unidimensional Congruence (UniCo), Explained Common Variance (ECV), and Mean of Item REsidual Absolute Loadings (MIREAL) indices were employed to study the fit of the data to a single dimension. The following values support treating the data as essentially unidimensional: UniCo > 0.95, ECV > 0.85, MIREAL < 0.30 [72]. Factor loadings were taken into account, the criterion being that they were greater than 0.40. The Expected Residual correlation direct Change index (EREC [73, 74]), was also used to assess the residual correlation between a pair of items once the influence of the common factors has been partialled out. Comparative Fit Index (CFI) and Root Mean Square of Residuals (RMSR) were used as fit indices, establishing a good fit when CFI > 0.95 and RMSR < 0.06 [75].

On the other hand, with the second subsample (2/3, 400 participants), the internal structure of the instrument was studied through a Confirmatory Factor Analysis (CFA), in order to confirm the unidimensional factor structure that had been concluded in the EFA. The estimation method used was ULS. CFI and RMSR were used as fit indices. In addition, due to the importance of studying the factor structure of a construct across different populations, measurement invariance was studied as a function of sex, calculating the configural, metric, and scalar invariance through Multi-Group Confirmatory Factor Analysis (MG-CFA). Configural invariance implies that the latent scales variable(s) and the pattern of loadings of the latent variable(s) on indicators are similar across gender (i.e., the unconstrained latent model should fit the data well in both groups). Metric invariance implies that the magnitude of the loadings is similar across gender; this is tested by comparing two nested models consisting of a baseline model and an invariance model. Lastly, scalar invariance implies that both the item loadings and item intercepts are similar across gender and is examined using the same nested-model comparison strategy as with metric invariance [76]. As these are nested models, a change in CFI of less than -0.01 ($\Delta\text{CFI} < -0.01$ [77]), is accepted to assume measurement invariance.

Next, descriptive statistics were used (mean, standard deviation, skewness and kurtosis) for the items. The discrimination indices were analyzed (corrected item-test correlations), being considered adequate when they were over 0.20 [78]. Also, the reliability of the scores was studied through the standardized Cronbach's alpha coefficient.

Table 1 Sociodemographic characteristics of the participants ($n = 601$)

Age (years)	29.91 12.61
Household crowding index (person/room)	1.04 0.51
Gender	
Male	224 (37.3%)
Female	377 (62.7%)
Marital status	
Single	456 (75.9%)
Married	145 (24.1%)
Education	
Secondary or less	110 (18.3%)
University	491 (81.7%)

Descriptive statistics, and discrimination indices were calculated with the SPSS 24 program ([79]). EFA and reliability were calculated with FACTOR program [80]. The CFA and measurement invariance were carried out with the MPlus8 program [81].

Results

A total of 601 participants completed the survey (mean age 29.91 ± 12.61 ; 62.7% females and 81.7% with a university level of education). Other sociodemographic characteristics of the participants are shown in Table 1. Descriptive statistics of the Gratitude Questionnaire items are summarized in Table 2.

The KMO (0.74) and Bartlett's statistic ($p < .001$) confirmed the adequacy to run an EFA using our data. Two items were removed because of a low factor loading (< 0.40), with poor fit indices (e.g., $\text{RMSR} = 0.133$). The EFA of the remaining four items showed a good fit, with an MSA above 0.50 (Table 3). Items loaded on a single factor (as recommended by the parallel analysis), which explained 67.05% of the total variance. Adequate indicators were obtained: $\text{UniCo} = 0.923$, $\text{ECV} = 0.811$, $\text{MIREAL} = 0.324$. As for the correlated residuals, no doublets (pair of items) were identified with EREC. Furthermore, the fit indices were satisfactory: $\text{CFI} = 0.999$

Table 3 Factor loadings deriving from the exploratory and confirmatory factor analysis of the Gratitude Questionnaire items

Original item number	Label	Item-test correlation (corrected)	MSA	Factor loading (EFA)	Factor loading (CFA)
01	I have so much in life to be thankful for.	0.781	0.682	0.893	0.874
02	If I had to list everything that I felt grateful for, it would be a very long list.	0.788	0.677	0.900	0.883
04	I am grateful to a wide variety of people.	0.673	0.883	0.641	0.733
05	As I get older, I find myself more able to appreciate the people, events, and situations that have been part of my life history.	0.651	0.895	0.560	0.732

and $\text{RMSR} = 0.032$. Afterwards, the unidimensional factor structure of the instrument was tested through a CFA. The fit indices were also adequate ($\text{CFI} = 0.970$, $\text{RMSR} = 0.036$). The factor loadings of the EFA and CFA are summarized in Table 3. The internal consistency of the scale was adequate as shown ($\alpha = 0.83$, $\omega = 0.88$). Each item of the scale showed adequate skewness and kurtosis values (Table 3), with a high discriminative power per item (I.D. [0.651 – 0.788]).

Measurement invariance

On the other hand, once the unidimensional factor structure had been verified, we went on to study the measurement invariance as a function of gender, the fit being

Table 2 Descriptive statistics of the gratitude questionnaire items

Original item number	Label	Mean	SD	Skewness	Standard error of skewness	Kurtosis	Standard error of kurtosis
01	I have so much in life to be thankful for.	5.28	1.38	-0.71	0.10	0.27	0.20
02	If I had to list everything that I felt grateful for, it would be a very long list.	5.00	1.50	-0.58	0.10	-0.20	0.20
03	When I look at the world, I don't see much to be grateful for.	4.44	1.45	-0.27	0.10	-0.29	0.20
04	I am grateful to a wide variety of people.	4.90	1.33	-0.65	0.10	0.49	0.20
05	As I get older, I find myself more able to appreciate the people, events, and situations that have been part of my life history.	5.22	1.29	-0.54	0.10	0.25	0.20
06	Long amounts of time can go by before I feel grateful to something or someone	3.43	1.39	0.71	0.10	0.28	0.20

Note. SD = standard deviation, MSA = Measure of Sampling Adequacy

Table 4 Measurement invariance of gratitude scale based on sex

	X ² (df)	RMSEA [90% CI]	TLI	CFI	SRMR	ΔCFI	ΔX ²	ΔRMSEA
Sex								
Men	20.51	0.129 [0.05–0.21]	0.831	0.944	0.047	-	-	-
Women	23.58	0.113 [0.05–0.17]	0.912	0.971	0.030	-	-	-
Configural	44.08 (4)	0.183 [0.136–0.23]	0.906	0.965	0.037	-	-	-
Metric	45.68 (7)	0.136 [0.10–0.17]	0.948	0.999	0.046	0.034	1.59	0.047
Scalar	58.15 (10)	0.127 [0.09–0.15]	0.955	0.993	0.057	-0.006	14.07	0.009

adequate for both men and women and the three levels of invariance studied (configural, metric and scalar) being fulfilled as a function of gender (Table 4). The comparison between genders showed a significantly higher mean gratitude score in females compared to males (20.80 ± 4.87 vs. 19.72 ± 4.23 , $t(599) = -2.86$; $p = .004$; Cohen's $d = 0.233$).

Divergent validity (total sample)

The GQ-4 scores were significantly and positively associated with greater social support ($r = .57$, $p < .001$), but not associated with psychological distress total score ($r = -.02$, $p = .663$) or with depression ($r = -.07$, $p = .089$), anxiety ($r = -.02$, $p = .580$) or stress ($r = .07$, $p = .085$).

Discussion

Providing a valid and reliable Arabic version of the GQ-6 may encourage practitioners and researchers to explore the unique features of gratitude experience in the Arab context, foster its societal benefits, and enable future cross-cultural and international comparisons. In this context, we decided to adapt and validate a short, convenient, and economic self-report measure of gratitude, i.e., the GQ-6, in the Arabic language among Lebanese adults of the general population. With regard to factorial validity, findings demonstrated that the one-factor model with four items (CG-4) showed a good fit on all the indices. In addition, results provided favorable evidence for good internal consistency, gender invariance, and discriminant validity. In sum, these findings preliminarily support that the Arabic GQ-4 is suitable for measuring the gratitude construct among Arabic-speaking populations.

As for construct validity, we started from the pool of six items and we used a strong approach (EFA-to-CFA) which is recommended when dealing with a unidimensional factor structure [82]. Findings indicated that a four-item version of the GQ achieved adequate fit statistics with the removal of the two reverse-scored third and sixth items (i.e. “When I look at the world, I do not see much to be grateful for” and “Long amounts of time can go by before I feel grateful to something or someone”). Overall, findings regarding the factor structure of the GQ-6 were inconsistent and inconclusive across samples and contexts. Numerous linguistic validations failed to replicate the original 6-item version, and showed that

a 5-item model provided the best model fit (e.g. [25, 27, 29, 37, 40, 42, 45, 52, 53]). In this 5-item model, the sixth item has consistently been removed due to its low correlations with the instrument as a whole [52], as well as difficulties in the understanding of its meaning [47]. In the Dutch validation study, although the 6-item model showed generally poor fit, the sixth item was retained as its elimination did not improve the model fit [33]. More recently, a Filipino adaptation started with the pool of five items, and showed that a three-item version (GQ-3) provided the best model fit [36]. These mixed findings might also be explained by variations in the way how the gratitude concept is constructed across cultures. In particular, psychometric performance of reverse-coded items appear to vary across cultures. Indeed, there is a growing consensus that, in some cultures (e.g., Spanish [83]), reverse-coded items be either non-included or included in an un-reversed fashion in measures within some cultures. In line with our findings, combining positive and reversed items in the same measure were found to compromise its reliability and unidimensionality [84]. In addition, reverse-worded items were shown to induce respondent inattention and confusion, and to be ineffective in preventing response bias [85]. In sum, additional validation studies are still needed to further explore the factor structure of the Arabic GQ-4, and confirm the robustness of the current 4-item model.

Beyond factorial validity, our results revealed a McDonald Omega coefficient for the total GQ-4 scores of 0.88, thus attesting for the good reliability of the scale. The same evidence for a good-excellent internal consistency has been observed in previous versions of the GQ-6 (e.g., Brazilian Portuguese: Cronbach's $\alpha = 0.87$ [38], Hindi: $\alpha = 0.74$ [45], Japanese: $\alpha = 0.92$ [39], Chinese: $\alpha = 0.80$ [40], Spanish: $\alpha = 0.926$ [27], Italian: $\alpha = 0.745$ [31], Filipino: $\alpha = 0.80$ [35], Hungarian: $\alpha = 0.75–0.79$) [34]). Furthermore, multiple-group CFA analyses showed that the scale structure was invariant across male and female respondents at the configural, metric, and scalar levels. Consistently, previous findings provided support for gender invariance (e.g. [25, 35, 36, 38, 41]). Thus, suggesting that all four items were interpreted in a similar way across gender groups. Such evidence will facilitate future meaningful comparisons across gender. In this regard, we found that females exhibited significantly

higher gratitude scores compared to males, which corroborates findings from previous international studies [86–88] and suggests that females are more likely to feel, express and benefit from gratitude.

As expected, discriminant validity of the Arabic GQ-4 was evidenced through positive significant correlations with social support levels. These findings are in agreement with well-established findings on the relationship between gratitude and social support, as gratitude is consistently found to promote interpersonal ties and enhance perceived social support [8–13]. In this line, evidence for discriminant validity of the GQ-6 has previously been provided through similar patterns of correlations with the MSPSS (e.g. [46]) scores. These findings further confirm the predictive power of gratitude regarding psychological indicators, and its potential interpersonal and mental benefits. This highlights the high clinical relevance of gratitude, and its key role in fostering positive psychology [1, 89], particularly in vulnerable people who deal with mental health problems [20, 90].

Finally, non-significant correlations were observed between gratitude, and depression/anxiety/ scores. This result was inconsistent with the existing literature which has largely reported inverse associations between gratitude and psychopathology indicators [91]. However, the relationship between gratitude and mental health indicators remains a challenging debate due to some null or controversial findings. A meta-analysis indicated that gratitude interventions had only a small effect on depression and anxiety symptoms [92]. Moreover, and in contrast with the general literature, a previous study has even shown that a gratitude intervention reduced well-being [93]. An explanation to the inconsistent findings could be that the effects of gratitude may vary according to various situations and/or contexts. For example, gratitude may cease to be beneficial or adaptive in some circumstances, such as within a context of an abusive relationship [94]. In addition, the experience of gratitude may also have more meaning and importance in some cultures than others [95]. Differences in experiences and understandings of gratitude across cultures can explain its differential effects on mental health outcomes across studies.

Study limitations

Certain limitations need to be acknowledged. First, we used a convenience sampling and a web-based method, which could limit the generalizability of our findings. Second, our sample size was unbalanced in terms of gender, and was relatively small. Third, we could not examine other important psychometric properties in the context of the current study, such as convergent validity and test-retest reliability. As such, future validation studies still need to address this limitation. Finally, we included participants from one Arab country, which might slightly

differ in terms of cultural background from other Arab countries. Further cross-national research is required to confirm the robustness of the scale in different Arab contexts.

Practical implications and future directions

The validation, for the first time, of the Arabic version of the Gratitude Questionnaire will provide practitioners and researchers with a comprehensive and convenient tool for assessing gratitude among Arabic language speakers, and will foster research on the topic. It is also hoped that the Arabic measure will facilitate cross-national comparison research on the nature and outcomes of gratitude expressions, and expand understanding of how the concept is construed across different cultures and contexts. In addition, offering a valid and reliable instrument to measure gratitude will help healthcare professionals, educators, researchers, and policy maker in informing the development and monitoring of more effective, culturally tailored gratitude interventions aimed at improving mental health outcomes in Arab settings.

Conclusion

Findings revealed that the Arabic adaptation of the GQ (GQ-4) showed good psychometric qualities, suggesting that it is suitable for measuring people's disposition toward gratitude in Arab backgrounds. Offering the Arabic GQ-4 as a brief, simple, cost-effective, valid, and reliable measure of gratitude to the Arabic-speaking community could help raise awareness about gratitude as a key component for achieving good mental health and wellbeing in Arab contexts. It may also foster research to develop, test and implement culture-tailored gratitude-based interventions that cultivate and develop this dispositional quality in Arab people. Further validation studies are still needed to substantiate the robustness of our findings.

Acknowledgements

The authors would like to thank all participants.

Author contributions

FFR, SO and SH designed the study; FFR drafted the manuscript; AP and SH carried out the analysis and interpreted the results; DM, ASED and MM collected the data; RH reviewed the paper; all authors reviewed the final manuscript and gave their consent.

Funding

None.

Data availability

The datasets generated and/or analyzed during the current study are not publicly available due to restrictions from the ethics committee but are available from the corresponding author on reasonable request.

Declarations

Ethics approval and consent to participate

The Ethics and Research Committee at the Lebanese International University approved this study protocol (Approval number: 2023RC-010-LIUSOP; Approval date: February 12, 2023). A written informed consent was considered obtained from each participant and from parents or the legal guardian(s) of the participants below 16 years of age involved in the study when submitting the online form. All methods were performed in accordance with the relevant guidelines and regulations.

Consent for publication

Not applicable.

Competing interests

The authors declare no competing interests.

Author details

¹The Tunisian Center of Early Intervention in Psychosis, Department of Psychiatry "Ibn Omrane", Razi Hospital, Manouba 2010, Tunisia

²Faculty of Medicine of Tunis, Tunis El Manar University, Tunis, Tunisia

³Department of Psychology, University of Oviedo, Oviedo, Spain

⁴College of Pharmacy, Gulf Medical University, Ajman, United Arab Emirates

⁵Department of Biomedical Sciences, School of Arts and Sciences, Lebanese International University, Beirut, Lebanon

⁶School of Pharmacy, Lebanese International University, Beirut, Lebanon

⁷School of Medicine and Medical Sciences, Holy Spirit University of Kaslik, P.O. Box 446, Jounieh, Lebanon

⁸Department of Infectious Disease, Bellevue Medical Center, Mansourieh, Lebanon

⁹Department of Infectious Disease, Notre Dame Des Secours, University Hospital Center, Byblos, Lebanon

¹⁰Department of Psychology and Education, School of Arts and Sciences, Lebanese American University, Jbeil, Lebanon

¹¹Psychology Department, College of Humanities, Effat University, Jeddah 21478, Saudi Arabia

¹²Applied Science Research Center, Applied Science Private University, Amman, Jordan

Received: 16 October 2023 / Accepted: 3 February 2025

Published online: 20 February 2025

References

- McCullough ME, Emmons RA, Tsang J-A. The grateful disposition: a conceptual and empirical topography. *J Personal Soc Psychol*. 2002;82(1):112.
- Allen S. The science of gratitude. PA: John Templeton Foundation Conshohocken; 2018.
- Emmons RA, Stern R. Gratitude as a psychotherapeutic intervention. *J Clin Psychol*. 2013;69(8):846–55.
- Wood AM, Froh JJ, Geraghty AW. Gratitude and well-being: a review and theoretical integration. *Clin Psychol Rev*. 2010;30(7):890–905.
- Portocarrero FF, Gonzalez K, Ekema-Agbaw M. A meta-analytic review of the relationship between dispositional gratitude and well-being. *Pers Indiv Differ*. 2020;164:110101.
- Renshaw TL, Olinger RM, Steeves. What good is gratitude in youth and schools? A systematic review and meta-analysis of correlates and intervention outcomes. *Psychol Sch*. 2016;53(3):286–305.
- Watkins PC. Gratitude and the good life: toward a psychology of appreciation. Springer; 2013.
- Bartlett MY, et al. Gratitude: prompting behaviours that build relationships. *Cognition Emot*. 2012;26(1):2–13.
- Bartlett MY, DeSteno D. Gratitude and prosocial behavior: helping when it costs you. *Psychol Sci*. 2006;17(4):319–25.
- You S, Lee J, Lee Y. Relationships between gratitude, social support, and prosocial and problem behaviors. *Curr Psychol*. 2020; pp. 1–8.
- Yunanto TAR. The power of positivity: the roles of prosocial behavior and social support toward gratitude. *Jurnal Psikologi Ulayat*. 2020;7(1):57–68.
- Wood AM, et al. The role of gratitude in the development of social support, stress, and depression: two longitudinal studies. *J Res Pers*. 2008;42(4):854–71.
- Algoe SB. Find, remind, and bind: the functions of gratitude in everyday relationships. *Soc Pers Psychol Compass*. 2012;6(6):455–69.
- Lambert NM, Fincham FD, Stillman TF. Gratitude and depressive symptoms: the role of positive reframing and positive emotion. *Cognition Emot*. 2012;26(4):615–33.
- Iodice JA, Malouff JM, Schutte NS. The association between gratitude and depression: a meta-analysis. *Int J Depress Anxiety*. 2021;4(1):1–12.
- Kendler KS, et al. Dimensions of religiosity and their relationship to lifetime psychiatric and substance use disorders. *Am J Psychiatry*. 2003;160(3):496–503.
- Froh JJ, et al. Gratitude and the reduced costs of materialism in adolescents. *J Happiness Stud*. 2011;12:289–302.
- Froh JJ, Miller DN, Snyder S. *Gratitude in children and adolescents: Development, assessment, and school-based intervention*. in *School Psychology Forum*. 2007.
- Wood AM, et al. A social-cognitive model of trait and state levels of gratitude. *Emotion*. 2008;8(2):281.
- Wood AM, Joseph S, Maltby J. Gratitude uniquely predicts satisfaction with life: incremental validity above the domains and facets of the five factor model. *Pers Indiv Differ*. 2008;45(1):49–54.
- Watkins PC, et al. Gratitude and happiness: development of a measure of gratitude, and relationships with subjective well-being. *Social Behav Personality*. 2003;31(5):431–51.
- Morgan B, Gulliford L, Kristjánsson K. A new approach to measuring moral virtues: the multi-component Gratitude measure. *Pers Indiv Differ*. 2017;107:179–89.
- Lerner E. Positive psychology. utb GmbH; 2019.
- McCullough ME, Tsang J-A, Emmons RA. Gratitude in intermediate affective terrain: links of grateful moods to individual differences and daily emotional experience. *J Personal Soc Psychol*. 2004;86(2):295.
- Langer Á, et al. Validation of a Spanish translation of the Gratitude Questionnaire (GQ-6) with a Chilean sample of adults and high schoolers. *Health Qual Life Outcomes*. 2016;14(1):1–9.
- Carmona-Halty MA, Marín-Gutiérrez M, Belmar-Saavedra F. Análisis psicométrico Del Gratitude Questionnaire 6 (GQ-6) en población chilena. *Universitas Physiol*. 2015;14(3):881–8.
- Vélez MC, et al. Adaptation and validation of the Gratitude Questionnaire GQ-6 for the Ecuadorian context. *Avaliação Psicológica: Interamerican J Psychol Assess*. 2019;18(2):129–37.
- García-Álvarez D, et al. Validation study of the Gratitude questionnaire—six item form in a Venezuelan general population sample of young adults. *Gaceta Médica De Caracas*. 2023;131(3):625–39.
- Magallares A, Recio P, Sanjuán P. Factor structure of the Gratitude Questionnaire in a Spanish sample. *Span J Psychol*. 2018;21:E53.
- Michailidis G, Maridaki-Kassotaki A. Reliability and construct validity of the Greek Gratitude Questionnaire (GQ6) in a sample of children aged 11 to 12 years. *Dialogues Clin Neurosci Mental Health*. 2020;3(1):56–62.
- Caputo A. Italian translation and validation of the GQ-6. *Int J Wellbeing*. 2016. 6(2).
- Kossakowska M, Kwiatek P. *Polska adaptacja kwestionariusza do badania wdzięczności GQ-61*. 2014.
- Jans-Beken L, et al. Measuring gratitude: a comparative validation of the Dutch gratitude questionnaire (GQ6) and short gratitude, resentment, and appreciation test (SGRAT). *Physiol Belgica*. 2015;55(1):19.
- Tamás M, Magdolna G, Judit D. *Hála Kérdőív magyar változatának (GQ-6-H) bemutatása és pszichometriai elemzés [Introduction and psychometric properties of the Hungarian version of the Gratitude Questionnaire (GQ-6-H)]*. *Mentál-higiéné Pszichoszom*, 2014. 15: pp. 203–214.
- Llenares I, Almeda C. PSYCHOMETRIC QUALITY OF THE GRATITUDE QUESTIONNAIRE IN FILIPINO COLLEGE STUDENTS 1. *Psicología Conductual*. 2021;29(3):667–80.
- Valdez JPM, Yang W, Datu JAD. Validation of the Gratitude Questionnaire in Filipino secondary school students. *Span J Psychol*. 2017;20:E45.
- Yüksel A, Oguz N, Duran. Turkish adaptation of the gratitude questionnaire. *Eurasian J Educational Res*. 2012;46:199–215.
- Gouveia VV, et al. Gratitude Questionnaire (GQ-6): evidence of construct validity in Brazil. *Curr Psychol*. 2021;40:2481–9.
- Sumi K. Reliability and construct validity of the Gratitude Questionnaire 6 Item Form (GQ 6) in a sample of Japanese college students. *J Posit Psychol Wellbeing*. 2017;1(2):73–84.
- Chen LH, et al. Validation of the Gratitude Questionnaire (GQ) in Taiwanese undergraduate students. *J Happiness Stud*. 2009;10:655–64.

41. Kong F, You X, Zhao J. Evaluation of the gratitude questionnaire in a Chinese sample of adults: factorial validity, criterion-related validity, and measurement invariance across sex. *Front Psychol*. 2017;8:1498.
42. Hudecek MF, et al. Measuring gratitude in Germany: validation study of the German version of the Gratitude Questionnaire-Six item form (GQ-6-G) and the multi-component Gratitude measure (MCGM-G). *Front Psychol*. 2020;11:590108.
43. Tran TAT, et al. The Vietnamese Version of the Gratitude Questionnaire (GQ) and the revised short Gratitude, Resentment, and appreciation test (S-GRAT): Psychometric Properties among adolescents. *Jpn Psychol Res*. 2022;64(3):295–307.
44. Grimaldy DV, Haryanto HC. Adaptation of gratitude questionnaire-6 (gq-6) in Indonesian context. *Jurnal Psikologi*. 2020;47(1):18–29.
45. Dixit SK, Sinha J. Adaptation and validation of the gratitude questionnaire (GQ-6) for the Indian context. *Curr Psychol*. 2021; pp. 1–11.
46. Murphy M, et al. A report on the translation into Kiswahili, and subsequent validation, of three positive psychology scales. *EAS J Psychol Behav Sci*. 2022;4(5):124–33.
47. Froh JJ, et al. Measuring gratitude in youth: assessing the psychometric properties of adult gratitude scales in children and adolescents. *Psychol Assess*. 2011;23(2):311.
48. Cousin L, et al. Psychometrics of the Gratitude Questionnaire-6 in African-americans at Risk for Cardiovascular Disease. *West J Nurs Res*. 2020;42(12):1148–54.
49. Hatori K, Kodama M, Koganei K. *Development of Japanese version of the Gratitude Questionnaire-6 (J-GQ-6)*. in *3rd annual international conference on cognitive and behavioral psychology (CBP 2014)*, Singapore. https://doi.org/10.5176/2251-1865_cbp14. 2014.
50. Kossakowska M, Kwiatek P. The Polish adaptation of the Gratitude Questionnaire (GQ-6). *Przegląd Psychologiczny*. 2014;57:503–14.
51. Martos T, Garay M, Désfalvi J. Introduction and psychometric properties of the Hungarian version of the Gratitude Questionnaire (GQ-6-H). *Mentálhigiéné és Pszichoszomatika*. 2014;15(3):203–14.
52. Bernabé Valero G, García-Alandete J, Gallego-Pérez JF. Análisis Comparativo De Dos Modelos Del Gratitude questionnaire-six items form. Volume 45. *Revista Latinoamericana de Psicología*; 2013. pp. 279–88. 2.
53. Zeng Y, et al. The psychometric properties of the 5-item gratitude questionnaire in Chinese adolescents. *J Psychiatr Ment Health Nurs*. 2017;24(4):203–10.
54. Lima-Castro S, et al. Adaptación Y Validación Del Cuestionario De Gratitude GQ-6 para El Contexto Ecuatoriano. *Avaliação Psicológica*. 2019;18(2):129–37.
55. Langer AI, et al. Validation of a Spanish translation of the Gratitude Questionnaire (GQ-6) with a Chilean sample of adults and high schoolers. *Health Qual Life Outcomes*. 2016;14:1–9.
56. Yildirim M, Alshehri NA, Aziz IA. Does self-esteem mediate the relationship between gratitude and subjective well-being? *Pol Psychol Bull*. 2019;50(2):149–56.
57. Yildirim M, Alanazi ZS. Gratitude and life satisfaction: mediating role of perceived stress. *Int J Psychol Stud*. 2018;10(3):21–8.
58. El Khoury-Malhame M, et al. The psychological impact of COVID-19 in a socio-politically unstable environment: protective effects of sleep and gratitude in Lebanese adults. *BMC Psychol*. 2023;11(1):14.
59. Shin LJ, et al. Gratitude in collectivist and individualist cultures. *J Posit Psychol*. 2020;15(5):598–604.
60. Chang Y-P, Algoe SB. On thanksgiving: cultural variation in gratitude demonstrations and perceptions between the United States and Taiwan. *Emotion*. 2020;20(7):1185.
61. Floyd S, et al. Universals and cultural diversity in the expression of gratitude. *Royal Soc open Sci*. 2018;5(5):180391.
62. Merçon-Vargas EA, Poelker KE, Tudge JR. The development of the virtue of gratitude: theoretical foundations and cross-cultural issues. *Cross-Cultural Res*. 2018;52(1):3–18.
63. Mendonça SE, et al. The development of gratitude in seven societies: cross-cultural highlights. *Cross-Cultural Res*. 2018;52(1):135–50.
64. Van Widenfelt BM, et al. Translation and cross-cultural adaptation of assessment instruments used in psychological research with children and families. *Clin Child Family Psychol Rev*. 2005. 8(2).
65. Fenn J, Tan C-S, George S. Development, validation and translation of psychological tests. *BJPsych Adv*. 2020;26(5):306–15.
66. Ambuehl B, Inauen J. Contextualized measurement scale adaptation: a 4-Step tutorial for health psychology research. *Int J Environ Res Public Health*. 2022;19(19):12775.
67. Ali AM, et al. *The Depression Anxiety Stress Scale 21: Development and Validation of the Depression Anxiety Stress Scale 8-Item in Psychiatric Patients and the General Public for Easier Mental Health Measurement in a Post COVID-19 World*. *Int J Environ Res Public Health*. 2021. 18(19).
68. Zimet GD, et al. The multidimensional scale of perceived social support. *J Pers Assess*. 1988;52(1):30–41.
69. Fekih-Romdhane F, Fawaz M, Hallit R, Sawma T, Obeid S, Hallit S. Psychometric properties of an Arabic translation of the multidimensional social support scale (MSPSS) in a community sample of adults. *BMC Psychiatry*. 2023 Jun 14;23(1):432. <https://doi.org/10.1186/s12888-023-04937-z>
70. Lorenzo-Seva U, Ferrando PJ. MSA: the forgotten index for identifying inappropriate items before computing exploratory item factor analysis. *Methodology*. 2021;17(4):296–306.
71. Timmerman ME, Lorenzo-Seva U. Dimensionality assessment of ordered polytomous items with parallel analysis. *Psychol Methods*. 2011;16(2):209.
72. Calderón Garrido C, et al. Multidimensional or essentially unidimensional? A multi-faceted factoranalytic approach for assessing the dimensionality of tests and items. *Psicothema*. 2019.
73. Ferrando PJ, et al. Decalogue for the factor analysis of test items. *Psicothema*. 2022;34(1):7.
74. Ferrando PJ, Hernandez-Dorado A, Lorenzo-Seva U. Detecting correlated residuals in exploratory factor analysis: New proposals and a comparison of procedures. *Struct Equation Modeling: Multidisciplinary J*. 2022;29(4):630–8.
75. Hu Lt, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives. *Struct Equation Modeling: Multidisciplinary J*. 1999;6(1):1–55.
76. Fekih-Romdhane F, et al. Psychometric properties of an Arabic translation of the multidimensional assessment of interoceptive awareness (MAIA-2) questionnaire in a non-clinical sample of Arabic-speaking adults. *BMC Psychiatry*. 2023;23(1):577. <https://doi.org/10.1186/s12888-023-05067-2>
77. Chen FF. Sensitivity of goodness of fit indexes to lack of measurement invariance. *Struct Equation Modeling: Multidisciplinary J*. 2007;14(3):464–504.
78. Muñiz J, Fonseca-Pedrero E. Ten steps for test development. *Psicothema*. 2019;31(1):7–16.
79. Spss I. *Statistics for windows, version 24.0* [computer software]. Armonk, NY: IBM Corp; 2016.
80. Ferrando Piera PJ, Lorenzo U, Seva. Program FACTOR at 10: origins, development and future directions. *Psicothema*. 2017.
81. Muthén L, Muthén B. *Mplus user's guide (version 8.0)*. Mplus user's guide, 2017: pp. 1–950.
82. Swami V, Todd J, Barron D. Translation and validation of body image instruments: an addendum to Swami and Barron (2019) in the form of frequently asked questions. *Body Image*. 2021;37:214–24.
83. Venta A, et al. Reverse-coded items do not work in Spanish: data from four samples using established measures. *Front Psychol*. 2022;13:828037.
84. Suárez Álvarez J, et al. Using reversed items in Likert scales: a questionable practice. *Psicothema*. 30, 2018.
85. van Sonderen E, Sanderma R, Coyne JC. Ineffectiveness of reverse wording of questionnaire items: let's learn from cows in the rain. *PLoS ONE*. 2013;8(7):e68967.
86. Kashdan TB, et al. Gender differences in gratitude: examining appraisals, narratives, the willingness to express emotions, and changes in psychological needs. *J Pers*. 2009;77(3):691–730.
87. Skalski S, Pochwatko G. Gratitude is female. Biological sex, socio-cultural gender versus gratitude and positive orientation. *Curr Issues Personality Psychol*. 2020;8(1):1–9.
88. Roa-Meggo Y. Gender relations and differences between gratitude and personality in university students of Lima-Perú. *Psychologia Av De La Disciplina*. 2017;11(1):49–56.
89. Lin C-C, Yeh Y-c. How gratitude influences well-being: a structural equation modeling approach. *Soc Indic Res*. 2014;118:205–17.
90. Lambert NM, Graham SM, Fincham FD. A prototype analysis of gratitude: varieties of gratitude experiences. *Pers Soc Psychol Bull*. 2009;35(9):1193–207.
91. Jans-Beken L, et al. Gratitude and health: an updated review. *J Posit Psychol*. 2020;15(6):743–82.
92. Cregg DR, Cheavens JS. Gratitude interventions: effective self-help? A meta-analysis of the impact on symptoms of depression and anxiety. *J Happiness Stud*. 2021;22:413–45.
93. Sin NL, Della Porta MD, Lyubomirsky S. Tailoring positive psychology interventions to treat depressed individuals. *Applied positive psychology: improving everyday life, health, schools, work, and society*. New York, NY, US: Routledge/Taylor & Francis Group; 2011. pp. 79–96.

94. Wood AM, et al. A dark side of gratitude? Distinguishing between beneficial gratitude and its harmful impostors for the positive clinical psychology of gratitude and well-being. *The Wiley handbook of positive clinical psychology*; 2016. pp. 137–51.
95. Morgan B, Gulliford L, Waters L. Taking thanks for granted: a cross-cultural exploration of gratitude in the UK and Australia. *Cross-Cultural Res.* 2022;56(2–3):185–227.

Publisher's note

Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.