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Adaptation of the Duke University Religion Index for Turkish speaking Muslims

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ABSTRACT

The Duke University Religion Index (DUREL) was developed as a brief and comprehensive religiosity scale designed to be used in large epidemiological studies. The purpose of this study was to adapt DUREL for Turkish-speaking Muslims (TDUREL). The Turkish and English versions were compared by administering them to bilingual Turkish participants ($N = 46$). The final reconciled version was then tested for factorial structure and convergent and criterion validity among 532 Muslim Turkish-speaking individuals about half of whom lived in the United States and the remaining around the world, including Turkey. Convergent and criterion validity was analysed through comparison to Religious Identity Index and Pemberton Happiness Index, respectively. Reliability of the translated items was found to be between .73 and 1.00 (Pearson's r). The TDUREL's internal consistency was high (Cronbach's alpha = .90). The TDUREL adds to existing measures a shorter and psychometrically sound religiosity scale, which includes the important Muslim consideration of participation in organisational activities.

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Many people around the world are religious, and religiosity has important public health considerations being positively related to health and well-being (Koenig, 2018). Benefits of religious faith on immune functioning, longevity, and mental health are well documented (Garssen et al., 2020; Oman & Riley, 2018; Wang et al., 2020). The Duke University Religion Index (DUREL; Koenig & Büssing, 2010) was developed as a brief and comprehensive religiosity scale, originally written in English and designed to be used in large epidemiological research, including international studies. Conceptually, this scale measures three dimensions, which are intrinsic religiosity, non-organisational private religious activity, and participation in organised religious activity. The intrinsic religiosity dimension focuses on the integration of religious beliefs into how one interprets and experiences life; private religious activity includes praying, reading, and studying of the holy texts; and organised activity covers the congregational service attendance or small group gatherings. The DUREL has been translated to at least 18 different languages, studied in

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dozens of countries, and was the fourth most common measure of religiosity in the world in 2011–2016 (Koenig, 2018).

Muslims are the fastest growing religious community. The world's population is projected to grow 32% by 2060, and the number of Muslims is expected to increase by 70%, reaching nearly 3 billion (Lipka & Hackett, 2017). The DUREL has been translated for use in some predominately Muslim populations, including those that speak Farsi, Malay, and Arabic (Gonzales et al., 2015; Hafizi et al., 2013; Nurasikin et al., 2010; Saffari et al., 2013). The purpose of this study is to adapt the DUREL for use with the Turkish-speaking population, a prominent Muslim group.

To provide background for this study, we review the literature on the construct and measurement of religiosity for Muslim populations. Then we examine the existing brief religiosity scales in Turkish, and present the rationale for adapting DUREL to Turkish.

Measuring Muslim religiosity

Glock (1962) operationalises religiosity through five dimensions: ideological (overall beliefs of religion), intellectual (knowledge of religion, basic tenets, and sacred texts), ritualistic (behaviours mandated from religion such as fasting or prayer), experiential (emotions and feelings of adherence to the sacred) and consequential (how religion influences individual's behaviours and attitudes in daily life). Similar to other Abrahamic religions, Islamic religiosity exists as a multidimensional structure matching Glock's conceptualisation (El-Menouar, 2014).

Islam encompasses an amalgamation of rituals, beliefs, emotions, religious knowledge, and community involvement (Abu Raiya et al., 2008); however, many empirical studies looking at Muslim religiosity have used a single item to measure this complex construct (i.e., "Please rate your level/strength of religiosity") (Abdel-Khalek, 2019), which may lead to problems with limited content validity and construct underrepresentation. Although Abdel-Halek found some consistencies between single-item and multi-item measures of intrinsic religiosity for American and Kuwaitian college students (Abdel-Khalek & Lester, 2013), and Egyptian children (Abdel-Khalek, 2019); intrinsic religiosity does not represent all of the dimensions of Muslim religiosity. Methodologically, comparison studies of single-item versus multiple-item measures indicate that multiple items are superior in predictive validity unless the items are redundant semantically (Diamantopoulos et al., 2012). Islamic religiosity is better covered with multiple items than a single-item due to its inherent multidimensional nature. For instance, one might respond to a single item solely considering their faith, observation of rituals such as five-times daily prayer, or attendance to congregational services such as Friday prayer, confounding the interpretations of results. Also, there is evidence that the meaning and intensity of religiosity changes across the life span (Bengtson et al., 2015). Therefore, specifying the major dimensions of religiosity in the measure is a legitimate safeguard for ensuring construct validity.

While advocating for multiple items to ensure validity, it is paramount to also consider the pros and cons of giving lengthy surveys, a major concern in epidemiological research. Participants are less likely to complete a survey if it is lengthy (Guo et al., 2016; Sahlqvist et al., 2011). Taken together, a comprehensive, yet brief and low-burden measure of Muslim religiosity is needed for the different languages of the Muslim populations to

be included in international studies. DUREL is a five-item measure of religiosity developed for use in such large cross-sectional studies, and is one of the shortest multi-item measures of religiosity found in our literature review.

DUREL has shown consistent reliability and validity in measuring religiosity amongst Muslim populations (Gonzales et al., 2015; Hafizi et al., 2014; Nurasikin et al., 2010; Saffari et al., 2013). To validate the DUREL in the Farsi language (FDUREL), religiosity was measured among 2,558 college students from Iran. Cronbach's alpha ranged from .86 and .92, along with an intra-class correlation range of .937 to .991 (Saffari et al., 2013). Hafizi and his colleagues (2013) studied the concurrent validity of the Farsi DUREL through comparison with Hoge Intrinsic Religiosity Scale, and found a correlation coefficient of .78 (Spearman's rho). That study, with a sample of 557 medical students, confirmed internal consistency (.86) and test-retest reliability (.93; Spearman's rho) of the Farsi DUREL (Hafizi et al., 2013).

DUREL-M was adapted for the Malaysian people with a more generic language to make it inclusive among Muslim, Hindu, and Christian people. The measure had low internal consistency (Cronbach's alpha = .45), but a somewhat more acceptable test-retest reliability of .68 (Nurasikin et al., 2010). Later, the same researchers (Nurasikin et al., 2013) used the DUREL-M to assess trends of religiosity among psychiatric patients, and found a higher Cronbach's alpha of .80.

DUREL was also translated into Arabic along with four other languages, as part of a women's cardiovascular recovery study (Gonzales et al., 2015). In this study, twenty women who were born in Oman were recruited in the United States by a snowball sampling method (Gonzales et al., 2015). Although the Arabic speaking sample size was very small ($n = 20$), in the total sample ($N = 248$), the investigators reported good convergent validity with the Index of Religiousness (Zuckerman et al., 1984) yielding a Pearson r of .91 ($p = .01$)

Brief Religiosity Scales in Turkish

Turkish-speaking Muslims are the eight largest Muslim community (Diamant, 2019), with more than 82 million people living in Turkey, and an additional 6.5 million estimated to be living abroad (Turkish Ministry of Foreign Affairs, n.d.). According to Pew Research Center (2018), 69% of people in Turkey rated religion as being very important in their lives.

The Religious Identity Index (RII; Zagumny et al., 2012) is the shortest scale we found that is adapted to Turkish by Ayten (2013). According to our Google Scholar search, this scale has not been used in any published studies in its original language of English. And, the only language it has been translated into is Turkish. RII has a total of six items measuring the effect of religion on daily living and the importance of religion in one's life. While one of the items asks about private religious activities such as praying, none are related to organisational activities such as going to the mosque (Ayten, 2013). A more detailed description of the psychometric qualities of the scale is presented in the Method section because the measure is used for convergent validity of the Turkish DUREL (TDUREL).

The eight-item scale of Ok-Religious Attitude Scale was inspired by Glock's (1962) dimensional operationalisation of religiosity (Ok, 2011). The measure considers four dimensions: behaviours of worship, affect during religious experience, intimacy with

God, and attitude towards religiosity. Some items of this one-factor scale are "I try to abide by the rules of my religion", "I think religion is unnecessary", and "I feel God is very close to me".

Özer and colleagues' (2015) scale of religiosity has 11 items covering the dimensions of affect, behaviour, and effect of religion in life. The affect dimension of the scale focuses on religious faith, importance given to religion, and worshipping. The behaviour dimension asks about the individual religious practices such as reading and praying. And, the effect dimension involves the religious interpretations of meaning and experiences of life. Again, community based organisational activities are not covered by this scale.

A more recent scale by Harlak and Eskin (2018) is another one-factor measure, the Muslim Religiosity Scale (Musluman Dindarlik Olcegi). The content of this scale is also similar to Özer et al.'s (2015) measure with one item addition of "being happy to be around religious people". Like the other scales listed above, this 12-item scale does not measure any involvement in congregational religious activities.

Present study

Islam requires an active approach to religiosity, where submission to God's will through private and congregational worshipping activities, as well as experiencing life from the perspective of Islamic discourse, is necessary (El-Menouar, 2014). None of the Turkish brief scales has an item regarding congregational activities. The DUREL measures this dimension of organised religious activity along with non-organisational private religious activity and intrinsic religiosity. The DUREL demonstrates high test-rest reliability (.91), high internal consistency (Cronbach's alpha = .78 -.91), and high convergent validity with other religiosity measures ($r = .71–.86$) (Koenig & Büssing, 2010).

Consequently, DUREL stood out as the measure to be adapted to Turkish, given that none of the brief religiosity measures in Turkish covers all of the dimensions DUREL covers in a very brief and efficient way. Thus, the purpose of this study was to adapt DUREL for Turkish-speaking Muslims and examine the reliability, factorial structure, and convergent and criterion validity of the measure for Turkish-speaking Muslims.

All of the Turkish brief measures had one underlying factor when analysed, even though the items tapped various content dimensions. Accordingly, TDUREL was expected to present a one-factor structure, consistent with the Storch et al.'s (2004) analysis of the original DUREL.

The RII (Ayten, 2013; Zagumny et al., 2012) was selected to test the convergent validity of the TDUREL because it was the shortest available religiosity scale in Turkish. Another important reason was that Ayten, the author of the Turkish adaptation of RII, is a well-known scholar who studies the relationship of religiosity, health behaviours, and well-being (Ayten, 2013; Ayten & Korkmaz, 2019). In that sense, RII has credibility in epidemiological research. Further, Ayten and Korkmaz (2019) conducted a path analysis to investigate the relationship of religiosity, well-being, prosociality, and anxiety of Turkish Muslims; and they found a direct association from religiosity to life satisfaction ($\beta = .38$, $p < .001$, $CI = .29–.38$) using the RII (Ayten, 2013; Zagumny et al., 2012) and Satisfaction with Life Scale (SWLS; Diener et al., 1985; Durak et al., 2010). In accordance with the relevant literature, well-being was chosen to study the criterion validity of TDUREL.

Four hypotheses guided this adaptation study:

(1) The TDUREL will have acceptable internal consistency reliability.
(2) The TDUREL will present with a single-factor structure when tested with Confirmatory Factor Analysis (CFA).
(3) TDUREL will have good convergent validity with RII, reflected in a large correlation between the two scores.
(4) There will be a small to medium level correlation between TDUREL and well-being.

Method

The study was designed as a cross-sectional investigation, conducted in two stages. The first stage focused on the reliability of the translated items, and the second stage evaluated the convergent and criterion validity of the measure.

Participants

In stage one, 46 Muslim people who were bilingual in Turkish and English were recruited (69.6% female). The inclusion criteria was being a Muslim at least 18 years old. The denomination of the participants was not asked due to anonymity concerns. About 61% of the sample were 26–40 years old, 28% were 41 and above, and 11% between 18–25 years old. Among the participants, about 96% had some degree of a college education, either as a student or a graduate of two-year or four-year higher education degree programme.

Stage two participants were 532 Turkish-speaking Muslim people living all around the world. The demographic descriptors of the participants are presented in Table 1. About 52% of the participants reside in the US, 5% Canada, 20% Europe, 16% Turkey, 5% other Muslim country, and 2% other Non-Muslim country. These participants were recruited through North East Turkish American Scholars Association, Raindrop Women's

Table 1. Demographics.

		Frequency	Percent
	Total	532	100.0
Age	18–25	18	3.4
	26–40	289	54.3
	41 and above	225	42.3
Sex	Female	414	77.8
	Male	118	22.2
Education	Undergraduate student	25	4.7
	Four year college degree	404	75.9
	Two year college degree	58	10.9
	High school graduate	40	7.5
	Middle-school graduate	3	.6
	Elementary school graduate	2	.4
Region	USA	276	51.9
	Canada	26	4.9
	Europe	107	20.1
	Turkey	85	16.0
	Other Muslim country	26	4.9
	Other Nonmuslim country	12	2.3

Association; and the Facebook pages of Turks in Houston, New Jersey Turks, Amerika'da Yasayan Turkler (Turks Living in the US), and Gocmen Kadinlar (Immigrant Women). Female participants constituted 77.8% of the sample. About 54% of the sample was 26–40 years old, 42% was 41 and above, and 3% between 18–25 years old. The sample was largely college educated.

Measures

Demographics

To protect participant privacy, especially in light of the current political situation in Turkey, participation was anonymous. We were concerned that Turkish-speaking persons would be wary about being monitored by the Turkish government, which is often regarded as having a dictatorial regime (Uğur, 2018). Because the study is about religiosity, and the ruling party in Turkey claims to be a religious Sunni party, we had to make sure that people trust our intentions being solely scientific. Thus, we asked as little personal information as possible. Therefore, the only demographic variables that were collected were sex (i.e., female, male, prefer not to report), level of education (i.e., college student; graduates of college, two-year college, high school, middle school, elementary school; being literate), the age range (i.e., younger than 18, 18-25, 26-40, 41 and above), and religion (i.e., Muslim, other). The region of the participants was derived from the location provided by the online survey system indicating where they took the survey.

Religiosity

The DUREL (Koenig & Büssing, 2010) is a five-item scale that measures religiosity covering three dimensions; with one item asking about religious service attendance, the organisational dimension; one item about private religious activity, the non-organisational dimension; three items regarding the integration of religiosity in daily life, the intrinsic dimension. Responses to the first two items are rated on a six-point scale of frequency: *never, once a year or less, a few times a year, a few times a month, once a week,* and *several times a week*. Responses to the other three items are rated on a five-point scale anchored by *definitely not true* and *definitely true*. High scores represent greater religiosity.

RII was (Zagumny et al., 2012) adapted to Turkish by Ayten (2013). It is a six-item single-factor scale that measures the effect of religion on daily living and the importance of religion in one's life. *KMO* value of the bivariate correlation matrix is .76; Bartlett's sphericity value is *chi square* 819.682 ($p = 000$); and Cronbach's alpha is .85; indicating that the scale is coherent and amenable to factor analysis. Inter-item correlations of the scale range from .394 to .736 ($p = .000$) (Ayten, 2013).

Well-being

Pemberton Happiness Index (PHI; Hervás & Vázquez, 2013) was developed in seven languages, one of which is Turkish. It is a 21-item integrative well-being scale that consists general, eudaimonic, hedonic, and social components in remembered (11 items) and experienced (10 items) dimensions. Cronbach's alpha coefficient of this one-factor measure is .84. It has sufficient convergent validity with other measures of well-being and good incremental validity in predicting sleep quality and health. The present study

used the general, hedonic, and social components of remembered well-being, based on reasons described in the Results section.

Procedures

TDUREL's translation and cultural adaptation followed cross-cultural health care scale adaptation guidelines proposed by Sousa and Rojjanasrirat (2011). For the translation, it was recommended to use at least two native speakers of the target language, who are knowledgeable about the measure construct, and bicultural with the original and target culture. After obtaining approval from the University of Houston Institutional Review Board, five forward-translations (from English into Turkish) were created and back-translated into English. We assigned points to each translated and back-translated item based on its quality of capturing the original meaning. The item translations that got the highest total forward and backward quality points were reconciled to create the first translation of the measure.

This first version was compared with the original measure by administering the original and the Turkish versions to bilingual people ($N = 46$). Then, any discrepancies were resolved and the final version in Turkish was tested on a larger sample ($N = 532$).

Data analysis

Pearson's correlation coefficient was used to evaluate the equivalence of scores on the Turkish and English versions by the bivariate correlation of each item. . The Cronbach's alpha coefficient was computed for the internal consistency of the TDUREL, for which a score of .70 is considered acceptable (Nunnally & Bernstein, 1994). TDUREL's relationship with RII was examined for establishing convergent validity; and the bivariate correlations of TDUREL and RII with PHI were assessed for criterion validity. SPSS Version 26 was used to perform the analyses mentioned above.

For the confirmatory factor analysis (CFA) of the TDUREL, MPlus 7 software, the maximum likelihood estimation method was used. Indices for assessing model fit were the comparative fit index (CFI), standardised root mean square residual (SRMR), chi-square degrees of freedom, and root mean square error of approximation (RMSEA). Values of .90 and above for CFI and values smaller than .05 for SRMR are considered acceptable fit (Kline, 2016). Also, a RMSEA less than .08 indicates acceptable fit, with a confidence interval (CI) between 0 and .09 (Kline, 2016).

Missing values

Missing data from respondents was about 10%, and pairwise deletion was used during statistical analysis. Out of 532 people, 51 did not respond to the DUREL items. Chi square analyses was done to check for patterns of responding to DUREL. Education level, age, and sex did not yield any associations with answering the DUREL items (Table 2). We interpreted the missing values to be the product of DUREL being the last in the presentation order of the survey. An explanation was provided at the beginning of the RII items that another set of similar items would be presented towards the end,

Table 2. Missing value analysis.

	Educational Level		Age		Sex	
	Value /df	Asymp. Sig[1]	Value/ df	Asymp. Sig.[1]	Value /df	Asymp. Sig.[1]
PChi-Square[2]	1.355[a]/5	.929	.785[b]/2	.675	.751[c]/1	.386
LR[3]	1.900/5	.863	.795/2	.672	.721/1	.396
LLA[4]	.307/1	.580	.728/1	.393	.750/1	.387
N	532		532		532	

Note: [1]2-sided.
[2]Pearson Chi-square.
[3]Likelihood Ratio.
[4]Linear-by-Linear Association.
a. 6 cells (50%) have expected counts less than 5. The minimum expected count is 20.
b. 1 cell (16.7%) has expected count less than 5. The minimum expected count is 1.76.
c. 0 cells (.0%) have expected count less than 5. The minimum expected count is 11.53.

which were important to answer for comparison reasons. Unfortunately, 10% of the participants did not heed this request.

Results

The data analytic procedure proceeded in two stages. First, total scores from 46 English and Turkish bilinguals on both versions correlated at .96. Turkish and English version correlations of individual items were within the range of .68 - 1.0 (Table 3). Cronbach's alpha for this first Turkish version was .73.

The Turkish version of the fourth item, "My religious beliefs are what really lie behind my whole approach to life" was correlated lowest (.68) with the English version. Before finalising the translation, we made slight changes to this item, and tested it again with 54 bilingual participants. This time, the English and Turkish versions correlated at a level of .73.

During the second stage of the study ($N = 481$), using the Turkish version only, the final Cronbach's alpha was .90, indicating excellent internal consistency, which confirmed our first hypothesis. Next, a confirmatory factor analysis was conducted with this larger sample. Storch et al. (2004) reported a one-factor model, whereas Lace and Handal (2018) confirmed a three-factor model for the original measure. For the TDUREL, a one-factor model fit the sample data much better than the three-factor model, considering most of the fit indices (CFI = .97, SRMR = .03). The second hypothesis was accepted although $\chi 2(5 = 57.95, p < .001)$ and RMSEA (.148, CI: .11-.18) indices were not at expected levels. This one-factor model was concluded to be still tenable because the standardised factor loadings were between .6 and .95 ($p < .001$), and variances of all of the individual items except one (R^2 3rd item = .36) were higher than .5 indicating a strong relationship between the items and the scale (Table 4). Factor loadings and item-total statistics for the five items are presented in Table 4. The inter-item correlation matrix is presented in Table 5. Overall, these findings support an appropriate level of internal consistency.

Table 3. Correlation of English and Turkish Version Total Scores and Items.

Total	Item 1	Item 2	Item 3	Item 4	Item 5
.96	.86	1	1	.68	.98

$p = .01$, $N = 46$.

Table 4. Standardised Factor Loadings, R2, and Item Statistics of the TDUREL.

	Factor loading (SE[1])	R^2 (SE[1])	Mean	Std. Deviation	Cronbach's α if Item Deleted
Item 1	.75 (.02)	.57 (.03)	2.54	1.621	.883
Item 2	.83 (.01)	.69 (.03)	3.09	2.087	.873
Item 3	.60 (.6)	.36 (.04)	4.30	1.123	.914
Item 4	.90 (.01)	.80 (.02)	3.20	1.612	.859
Item 5	.95 (.008)	.91 (.01)	2.71	1.629	.848
Scale		48.221	15.84	6.944	

Note: p=.001; CFA model of total variance of each indicator is composed of shared and residual variances. Unobserved exogenous variables were assumed as independent. $N = 481$.
[1]Standard Error.

Table 5. Inter item correlation matrix.

	Item 1	Item 2	Item 3	Item 4	Item 5
1. Hangi sıklıkla camiye ya da diğer manevi toplantılara gidersiniz? (How often do you attend mosque or other religious meetings?)	1				
2. Hangi sıklıkla dua, namaz, Kur'an okumak gibi bireysel manevi faaliyetlerde bulunursunuz? (How often do you spend time in private religious activities, such as praying, prayer, or Qur'an recitation?)	.702**	1			
3. Hayatımda Allah'ın varlığını hissediyorum. (In my life, I experience the presence of the God.)	.406**	.490**	1		
4. Hayata bakışımın temelinde dini inanclarım vardır. (My religious beliefs are what really lie behind my whole approach to life.)	.640**	.723**	.609**	1	
5. Dinimi hayatımın her alanına yaymaya elimden geldiğince gayret ederim. (I try hard to carry my religion over into all other dealings in life.)	.716**	.795**	.549**	.863**	1

**$p < .01$ level (2-tailed).

Convergent validity

To assess convergent validity, the TDUREL total score and the Religious Identity Index (RII) total score were correlated. A significantly high result of .90 ($p < .001$) was obtained, thus providing strong support for convergent validity and acceptance of the third hypothesis. At the same time, TDUREL showed some distinctiveness from the RII: there was 19% unshared variance between the two.

Criterion validity

Criterion validity was investigated by correlating the TDUREL scores with the PHI (Hervás & Vázquez, 2013) scores. No relationship was found between the total PHI scores and TDUREL (Table 6); however, when the dimensions of PHI were analysed separately it

Table 6. Bivariate Correlations of TDUREL, RII, and Well-Being (Pearson).

	EWB	HWB	GEN_HWB_SOC	PHI Total
TDUREL	-.094*	.104*	.131**	.023
N	467	474	469	462
RII	-.074	.146**	.131**	.035
N	494	501	496	489

**$p < .01$ level (2-tailed), *$p < .05$ level (2-tailed). EWB: PHI items 3-8; HWB: Hedonic well-being items (9-10); GEN_-HWB_SOC: The total of general well-being (item 1), HWB and social well-being (item 11); PHI Total: Total of 11 remembered well-being items.

was found that eudaimonic well-being (EWB) dimension produced a negative correlation with DUREL (significant) and with RII (nonsignificant). Consequently, the items of EWB were removed from PHI in the analysis, and the remaining five items that constituted the total of general, hedonic, and social well-being in PHI yielded a positive significant correlation with TDUREL ($r = .13$, $p < .01$) as expected, leading to the acceptance of the fourth hypothesis. The bivariate correlations between TDUREL and all the dimensions of PHI are presented in Table 6. The correlations with RII are also provided for comparison reasons. A detailed examination of religiosity and well-being is reported in another paper (Esat et al., 2021).

Discussion

Turkish-speaking persons are a large subset of the world population for whom religiosity may be an important consideration in studies of health and well-being. The DUREL has been translated into multiple languages and is a widely used measure of religiosity for public health purposes (Koenig, 2018). Prior to this study, there was no Turkish version of the DUREL. The authors created and tested a linguistically and culturally appropriate translation of the DUREL for Turkish-speaking Muslim people. The reliability, factorial structure, and convergent validity of the TDUREL are supported by this study.

The anticipated criterion validity, correlation with well-being, was observed only when eudaimonic items (6) were removed. Indeed, the factor analysis of EWB items resulted in some non-significant numbers, which might been caused by translation issues. EWB of PHI (Hervás & Vázquez, 2013) might not be an appropriate dimension in studying Muslim religiosity because of construct validity problems.

A major limitation of our study is that, although we had a diverse sample of Turkish-speaking people residing all around the world, the participants were recruited by convenience sampling. Over 90% reported that they were currently or had been enrolled in higher education. Also, almost 78% of the sample was female, which further limits the external validity of the results. Similarly, we did not have data on the nationality or the residency status of our participants. Taken together, the generalisability of the results should be interpreted accordingly.

Another limitation was the lack of information about the denomination of the participants. Turkey has a mixed population of Shia and Sunni, Sunni being the majority (United States Department of State, 2018). Although the basic tenets of these denominations are not different with respect to the TDUREL items, further investigation across these groups could provide additional comparative information for content and criterion validity among the Muslim populations.

The high rate of missing values was another limitation caused by the presentation order of the survey. It is advised to counterbalance the order of the measures to prevent a pattern of missing values that lessened number of responders to the last presented measure.

Despite these limitations, this study provides good initial support for the construct validity of the DUREL with the Turkish-speaking population. The factor structure of the TDUREL was acceptable when used as a unitary scale, consistent with good internal consistency statistics in this study. The TDUREL adds to existing measures a shorter religiosity scale and one that includes the important Muslim consideration of participation in

organisational activities. We are confident that the TDUREL is appropriate for use with Turkish-speaking Muslims, and future studies should examine the relationship of this efficient and comprehensive measure of Muslim religiosity with other mental health variables, such as depression and anxiety.

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