

# Assessment of problematic anger using an Arabic adaptation of the Dimensions of Anger Reactions Scale-5 (DAR-5)

Ameer Kakaje (✉ [ameer.kakaje@hotmail.com](mailto:ameer.kakaje@hotmail.com))

Damascus University, Damascus Syria <https://orcid.org/0000-0002-3949-6109>

Kinda Alsamara

Deakin University <https://orcid.org/0000-0002-9130-4602>

David Forbes

University of Melbourne <https://orcid.org/0000-0001-9145-1605>

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## Short Report

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# Abstract

## Background:

Anger is a normal human emotion that is a common response to potentially traumatic events and implicated in the development and maintenance of post-traumatic stress disorder (PTSD). Anger is also a risk factor for aggression and violence. With millions of Syrians having to flee and being refugees in other countries, anger was rarely assessed as there was no brief robust tool for anger in Arabic.

## Objective:

To develop and test an Arabic version of the Dimensions of Anger Reactions 5 (DAR-5) scale, a five-question scale to screen for anger distress and problematic anger in adults and adolescents

## Method:

DAR-5 was translated into Arabic, then back translated into English, and finally re-checked for accuracy. Participants were 1641 Syrian adults, (621 males and 1020 females) and 784 adolescents aged between 14-16 years old (355 male and 429 female). Only Arabic speaking participants were included. Measures included the DAR-5 Arabic version (DAR-5 A) for both samples the Depression Anxiety Stress Scale-21 (DASS 21) for adults and the Children Revised Impact of Events Scale – 8 (CRIES-8).

## Results:

**High levels of internal reliability were reported** (Cronbach's  $\alpha$  of .86) and factor analysis found that DAR-5-A scores fit as a single-factor model. Problematic anger rates were 35.8% and 60.3% of adults and adolescents respectively across the population using the cut-off point for DAR-5-A of  $\geq 12$ . This cut off score also differentiated between scores high versus low scores on anxiety, depression and stress.

## Conclusions:

This study reinforces the importance of assessing for anger in these populations. The DAR-5A written in formal Arabic, is a critical measure that can be used as a brief measure to assess for this problematic anger in Syrians and other Arabic-speaking communities

# Introduction

Anger is a normal human emotion that manifests in a spectrum of expression from frustration and irritability to fury and rage (1). Most of the time anger serves as an adaptive and appropriate expression of emotion. However anger can be considered problematic when it occurs with a level of frequency, intensity, or duration that causes significant distress, actively interferes with interpersonal relationships and functioning, and is associated with aggressive behaviours towards others.

Anger is also a common response to potentially traumatic events such as natural disasters (2) and war (3). It has been found to be implicated in the development and maintenance of PTSD, a significant comorbidity associated with post-traumatic stress disorder (PTSD) beyond the PTSD items themselves that overlap with anger such as irritability (4), a risk factor for aggression and violence (5) and in the attenuation of PTSD treatment responsiveness (6). However, despite the ubiquitous nature of anger in trauma exposed populations and trauma survivors seeking treatment for PTSD, it is rarely assessed. This is partly due to the less prominent representation of problematic anger in the clinical and research literature compared to anxiety and depression, but also the historic limitations to the availability of brief and robust measurement tools.

In the assessment of anger, the State Trait Anger Expression Inventory-2 (STAXI 2) is considered the gold standard for assessing anger. However, a significant limitation to the STAXI-2 is that it is lengthy and hence does not easily lend itself to inclusion in brief survey assessment or treatment outcome batteries. Other common anger measures that could be considered include the Novaco Anger Scale (7), and the Multidimensional Anger Inventory (8). However these are also more lengthy and difficult for inclusion in population based studies or brief multi-outcome batteries.

In this context, there has been considerable interest in the Dimension of anger reactions 5 (DAR-5) scale (9). The DAR-5 is a brief 5 item measure that assesses the frequency, duration and intensity of anger, aggression orientation, and its interference with social relationship and general functioning and has demonstrated strong psychometric properties (9, 10). The measure also includes a validated cut off score for problematic anger, a feature not available in the STAXI-II. The measure is used increasingly widely internationally in military and veteran populations (11) including the large scale US military Millennium cohort study (12), disaster population studies (13), and community groups (14). One limitation has been its lack of availability in other languages. To begin to redress this, the measure was recently translated, tested and published in French (15).

Syria is a country that has been experiencing ongoing military conflict since 2011 and with refugees from this conflict escaping in their millions across the world particularly to Turkey, Jordan and across Europe. Given the considerable trauma exposure load experienced by the population, both still residing in Syria and as refugee across the world, it is of critical importance that anger be included as part of assessments for this population. This psychological distress increased further for Syrians in multiple countries due to COVID-19 as PTSD symptoms and mental disorder prevalence grew larger (16). In order for anger to be assessed routinely in Syria clinically and through population research it is important that the measure used to be as brief as possible as multiple hurdles for the conduct of measurement and research in Syria have been well noted and lengthy and complex measures potentially add further obstacles to adequate participation and assessment (17).

In view of the brevity, utility, psychometric robustness and increasingly wide-scale use of the DAR-5 (9), this study sought to develop an Arabic version of this measure to use for the assessment of problematic anger and tested across both adult and adolescent populations in Syria.

# Methods

Our study included two samples - adults and adolescents

## **Adult participants:**

Our study included 1579 participants with 602 (38.1%) males and 977 (61.9%) females and a mean age of 25.8 (SD = 6.5). Questionnaires were distributed online through the Department of Medicine, Damascus University and communicated through multiple social media channels. Distribution covered the period between June 8 – 17, 2020. Only Arabic speaking participants, particularly Syrians and/or who lived in Syria were included. Ethical approval was provided by the Damascus University Deanship. The questionnaires included a series of questions relating to demographic data, the DAR5 Arabic version and the DASS 21.

## **Adolescent participants:**

Questionnaires were distributed to schools from 1/3/2020 to 12/3/2020 across Syria. Only participants aged 16 years and younger were enrolled. Written consent was taken from the parents, and oral consent was also taken on the day of survey from the student. This study was approved by Damascus University, faculty of medicine ethical committee, and minister of education. Our sample included 784 with 355 (45.3%) being males and a mean age of  $15.8 \pm 0.4$  years. All participants were Arabic native speakers. The questionnaires included a series of questions relating to demographic data, the DAR5 Arabic version, and CRIES-8.

## **Measures**

### ***DAR-5***

The DAR-5 (9) is a 5-item scale that measures anger experience over the past 4 weeks. In response to items such as 'When I got angry, I got really mad,' respondents rate their anger experience on a 5-point scale ranging from 1 ('None or almost none of the time') to 5 ('All or almost all of the time'). The five scores are summed, with a total DAR-5 score ranging from 5 to 25. Higher scores indicate more severe anger experiences. The DAR-5 has demonstrated strong psychometric properties and been evaluated across community and trauma exposed populations (9, 18). It has been translated into French (15). Scores of 12 or above are indicative of problematic anger.

### ***The Arabic adaptation of the DAR-5 (DAR-5A)***

DAR-5 was translated into formal Arabic by the first author AK, a bi-lingual Syrian researcher and then back translated into English by co-author KA a bilingual expert academic and then re-checked for accuracy by co-author DF, developer of the DAR-5 version of the DAR, confirming the accuracy of the translation. The only modification to the wording of the English version was in item 1 "I found myself

getting angry. “was altered in the Arabic version to “I get angry” as the expression “found myself” is not an expression used in formal Arabic. A copy of the DAR-5- A can be seen in Table 1.

### ***DASS 21***

Depression Anxiety Stress Scale-21 (DASS-21) is a probabilistic scale of psychological distress with 3 subscales of depression, anxiety, and stress. It is a shorter version of DASS 42 that meant to minimise the overlapping between depression and anxiety (19). It has 21 questions with each 7 question covering one of the subscales. Each question has four answers with scores ranging from 0 to 4. The total score is then multiplied by 2 and then transferred to the DASS profile sheet that gives percentile ranking and severity labels. It has been demonstrated to have strong psychometric properties and is widely used. The DASS21 has been successfully translated into Arabic (20).

### ***CRIES-8***

Children’s revised impact of event scale 8 (CRIES-8) in Arabic (13) was used. It is a self-reporting scale that is used to screen for PTSD. It can be used in children aged eight years and older (21, 22). CRIES-8 consists of intrusion and avoidance subscale and when their sum is above 16, it indicates high PTSD probability. Although CRIES-8 depends on the criteria of diagnostic and statistical manual of mental disorders IV (DSM IV) (23, 24), CRIES-8 can be close to the criteria of International Classification of Disease 11 (ICD-11) as CRIES-8 consist of intrusion and avoidance.

## **Results**

- **Adult participants:**

### **DAR-5 A measurement**

#### ***1. Internal reliability and factor structure***

Consistent with the English and French versions of the DAR-5, the DAR-5A demonstrated strong internal reliability with a Cronbach’s  $\alpha$  of .83, with item total correlations ranging from 0.73 - 0.80 and no meaningful change associated with the deletion of any item, with  $\alpha$  ranging from 0.71-0.81. Also consistent with English and French versions of the DAR-5, in terms of factor structure, Confirmatory Factor Analysis (Figure 1) confirmed a one factor structure ( $\chi^2$  (5, N = 1579) = 35.30;  $p < 0.001$ ; GFI = 0.992, AGFI = 0.975, TLI (rho<sup>2</sup>) = 0.977, CFI = 0.989, RMSEA = 0.062).

#### ***2. Cut off and prevalence***

As outlined the cut off for problematic anger identified in previous studies was a DAR-5 score of  $\geq 12$ . This study identified that 566 participants, 35.8% of the population (37% in males and 35% in females) met this criterion for problematic anger among adult participants. The average DAR-5 score was 11.62 (SD = 4.38) among adults.

### 3. *Discriminant validity*

Multivariate Analysis of Variance indicated that respondents reporting DAR-5-A scores above the cut off for problematic anger recorded significantly greater scores on depression, anxiety and stress using the DASS21. Depression mean scores for the high and low anger groups were 24.65 (SD = 11.14) and 15.26 (SD = 9.77) respectively [F (1551) = 20.98,  $p < .001$ ]. Anxiety mean scores for the high and low anger groups were 14.45 (SD = 9.58) and 6.93 (SD = 6.90) respectively [F (1551) = 103.72,  $p < .001$ ]. Stress mean scores for the high and low anger groups were 24.47 (SD = 9.85) compared with 13.29 (SD = 9.28), respectively [F = 51.57 (1551),  $p < .001$ ].

- **Adolescents sample:**

#### 1. *Internal reliability and factor structure*

Consistent with the English and French versions of the DAR-5, the DAR-5A demonstrated strong internal reliability with a Cronbach's  $\alpha$  of 0.72 with item total correlations ranging from 0.63 - 0.73 and no meaningful change associated with the deletion of any item, with  $\alpha$  ranging from 0.64-0.75. Also in this adolescent sample the DAR5A demonstrated by using CFA (Figure 2) a one factor structure ( $\chi^2$  (5, N = 784) = 30.12;  $p < 0.001$ ; GFI = 0.985, AGFI = 0.955, TLI (rho2) = 0.927, CFI = 0.963, RMSEA = 0.080).

#### 2. *Cut off and prevalence*

This study identified that 473, that is 60.3% of adolescents, both males and females equally, met the cut off for problematic anger . The average DAR-5 score was 14.51 (SD = 5.15) among adolescents

### 3. *Discriminant validity*

Multivariate Analysis of Variance indicated that respondents reporting DAR-5-A scores above the cut off for problematic anger recorded significantly greater scores on PTSD scores of intrusion and avoidance. PTSD mean scores for the high and low anger groups were 18.04 (SD = 10.03) and 14.12 (SD = 9.73) respectively [F (776) = 29.13,  $p < 0.001$ ].

## Discussion

Anger is a common problem commonly observed in the community exposed to trauma, in particular trauma exposed clinical populations. However despite its ubiquitous nature and association with aggression and violence, anger is rarely assessed in routine clinical practice. This has historically been due, in part, to the absence of an accessible and validated brief measure of anger. Addressing this gap, the DAR-5 (9) is a brief measure of anger increasingly used across a range of trauma exposed populations internationally. Its brevity, strong psychometric properties make it an ideal tool for the screening, assessment and detection of problematic anger in populations. The DAR-5's sensitivity to change also renders it a brief tool suited to the inclusion in treatment outcome batteries where anger is

present in the clinical presentation. A French version of the DAR-5 (DAR-5-F) has now also been developed and successfully evaluated.

Given the prevalence of trauma exposure, and mental disorders including PTSD experienced across the Syrian population both those still residing in Syria and in Syrian refugee populations in adults and school students (25, 26), there was a need for a brief and robust Arabic language measure to assess anger. This study developed an Arabic version of the well validated DAR -5 (called the DAR-5-A) and demonstrated that consistent with the English and French versions of the measure, the Arabic version is psychometrically robust. The study identified that the measure demonstrated a one factor structure with strong internal reliability and discriminant validity. Critically the study also identified rates of 36% and 60% of problematic anger across adult and adolescent community samples respectively in Syria.

These findings indicate significant rates of problematic anger in the adult and adolescent population in Syria and therefore the importance of assessing anger across clinical and service planning contexts. A limitation to this study was the absence of the use of a measure of concurrent validity, such as the STAXI-II which was used in the initial validation of the measure. As indicated by Saadi et al ( ) the inclusion of the STAXI-II as an additional long questionnaire in this study would have significantly impacted participation rates and the fidelity of the responses. In addition there is only one study examining the Arabic version of the initial STAXI and with a limited sample size (27). The DAR-5-A (as seen in Table 1) therefore represents a quick and easy to use tool in the public domain to assess anger for use by any researcher or clinician working with Arabic speaking clients in either Syria or any Arabic speaking population. It represents a potential valuable addition to research and clinical practice protocols either as a screening tool, a component of multifaceted assessment or as part of a minimum data set treatment outcome battery.

## Declarations

- **Ethics approval and consent to participate:**

Online informed consent was taken before proceeding with the survey for participating in the research, and for using and publishing the data. We assured to maintain confidentiality and asked no questions that might reveal the person's identity. No subjects were under age of 14. For subjects under age of 16 years, an online informed consent was taken that the guardian agreed that the subjects can participate in the survey as this method was agreed in the study protocol.

Our study protocol and ethical aspects were reviewed and approved by Damascus University deanship, Damascus, Syria.

- **Consent for publication:**

Online consent for using and publishing the data were taken before participating in the research.

- **Availability of data and materials:**

The data can be made available upon reasonable request.

- **Competing interests:**

We have no conflict of interest to declare.

- **Funding:**

No funding was received for this study

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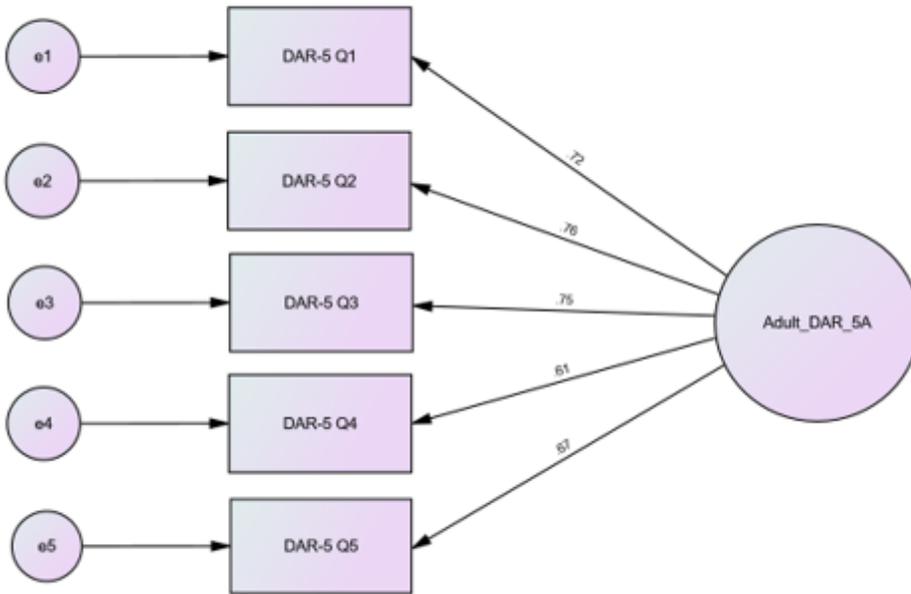


Figure 1

CFA of adults

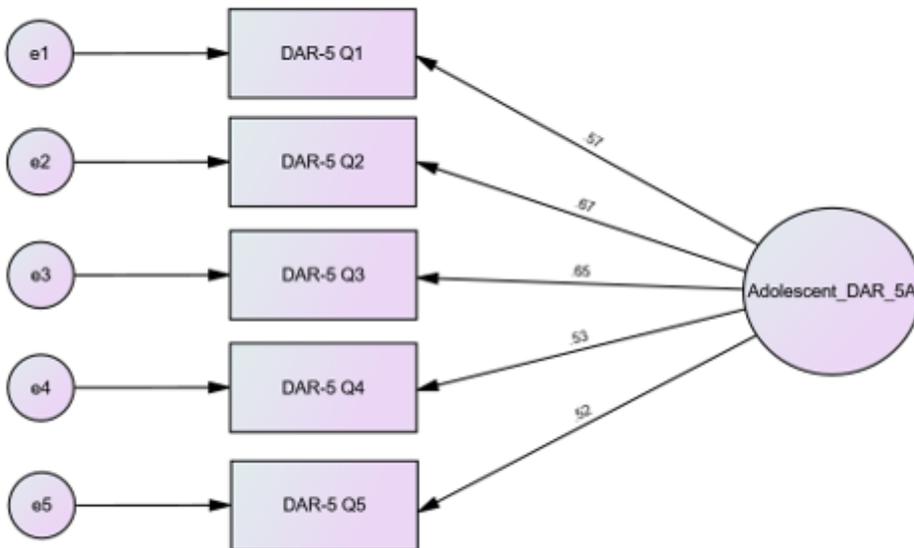


Figure 2

CFA of adolescents