

Psychometric Evaluation of the Fear of COVID-19 Scale among Syrian Population

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Abstract

Fear is a common emotional reaction to an impending threat like the pandemic caused by the COVID-19 virus. A fear of COVID-19 Scale has been developed to evaluate the severity of COVID-19 related fear. This study investigated the psychometric characteristics a Syrian Arabic version of the scale to give additional validation for the Arabic FCV-19S using an online survey of 1637 Syrian individuals. The results were compared with their responses to the Depression, Anxiety and Stress Scale and the Satisfaction with Life scale. Cronbach's alpha for the Syrian version of the fear of COVID-19 scale was determined to 0.84.

The scale's ratings showed a significant negative relationship with life satisfaction and a significant positive association with sub-scales of the Depression, Anxiety and Stress Scale.

Confirmatory factor analysis revealed that the Syrian version of the fear of COVID-19 Scale has a unidimensional structure which fits the data well. The scale has useful psychometric characteristics and can be employed to evaluate the severity of fear of COVID-19 among Syrian populations.

Keywords: Fear • COVID-19 • Syria • Anxiety stress and depression scale • Life satisfaction scale

Abbreviations

(COVID-19) Coronavirus 2019 Disease; (FCV-19S) Fear of COVID-19 Scale; (DASS-21) Depression Anxiety and Stress; (SWLS 12) Life Satisfaction was Evaluated using the Satisfaction with Life Scale; (EFA) Exploratory Factor Analysis; (CFA) Confirmatory Factor Analysis; (SPSS) Statistical Package for the Social Sciences; (GFI) Goodness of Fit Index; (TLI) Tucker-Lewis Index; (CFI) Comparative Fit Index; (RMSEA) Root Mean Square Error of Approximation; (SRMR) The Standardized Root Mean Square Residual.

Introduction

The outbreak of coronavirus 2019 disease (COVID-19) with its rapid transmission rate and a significant rate of infection has attracted the attention of academic communities, researchers, and experts worldwide [1]. After confirming the first COVID-19 case in Syria on March 22, 2020, the Syrian government took several measures including quarantine, tighter border control, lockdowns, and contact tracing to control the spread of the disease. It also implemented several public health measures, such as promoting handwashing, physical distancing, and self-isolation in an attempt to slow the disease's spread [2]. Almost 350 million coronavirus infections have been reported worldwide, causing 5.5 million deaths.

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Note: Fater A. Khadour and Younes A. Khadour contributed equally to this work, so they will be chosen to have joint first authorship (share first co-authorship)

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In Syria, according to the Coronavirus Resource Center, there had been almost 51,000 recorded cases and 2968 COVID-19 deaths. Vaccination against COVID-19 began in 2020, and a total of 9.6 billion doses of various vaccines have been administered worldwide to date writing of this article [3]. As of November 2021, 2,277,523 persons (13.0 percent of the Syrian population) had received one vaccination dose, while 932,422 (5.6 percent) had received two doses [3].

Fear, stress, depression, anxiety and other mood disorders have been reported as the result of COVID-19's persistence. All negatively impact people's health, psychological well-being and life satisfaction [1,4,5].

During the pandemic, some people placed in quarantine have developed mental health concerns such as anxiety, anger, or even post-traumatic stress disorder [6-8], and many studies have shown a significant association between social isolation and symptoms of anxiety and depression in both older and younger persons [9-11]. As during previous epidemics, negative psychosocial implications of anxiety have been recorded, indicating that people typically fluctuate between denial and phobia [12-16].

The COVID-19 disease itself and health measures such as quarantine, lockdown and their subsequent effects such as losing a job, financial difficulties and impacted daily activities would be expected to have a negative effect on life satisfaction, well-being and mental health [17]. Concerns about infection and the rising number of people infected lead to increasing fear of the virus, which in turn leads to an increased anxiety, depression, and stress [18,19]. That there is no credible prediction of how long the epidemic will last contributes to the feelings of uncertainty [20].

Recently, several studies have provided evidence confirming these concerns. For example, A survey of 52,730 individuals in China revealed that about one-third had some degree of psychological distress [21]. Another survey of 7236 individuals found that 35% of them had anxiety symptoms, and 20% had experienced depression [22].

Fear is considered among the pandemic's most prominent mental health impacts [23]. This may be fear of infection, fear of coming into contact with infected people, fear of transmitting the infection to others, the fear

engendered by the repeated emergence of new strains of the virus, or some combination [18,24]. Most previous studies of the COVID-19 pandemic have focused on diagnosis, prevention, vaccines, and therapies [19,25]. Few have focused on the psychological impacts of the COVID-19 pandemic, such as fear [18,25]. And most of the previous research which has dealt with the pandemic's psychological impacts has used generic or self-report scales such as the Impact of Event Scale or the short-form 36 questionnaire. Such scales are not specific to a particular driver like COVID-19 or to a particular response such as fear. As a result, a suitable evaluation tool was required to assess people's level of fear at the time of the pandemic and the psychological effects of the COVID-19 epidemic. The seven item Fear of COVID-19 Scale was developed in response to these requirements [18]. This is a short, unidimensional instrument which is simple to implement, easy to understand, and appropriate for all ages and genders [26].

The FCV-19S has been translated into Turkish [20], Arabic [27], Spanish [28], Japanese [29], Chinese [30], and other languages, and studies have been carried out in different countries to assess the instrument's psychometric features. Where all of the previous studies had satisfied psychometric features and shown internal consistency (measured by Cronbach's alphas) ranged between .80 and .92.

This study was designed to define the factor structure of the FCV-19S and evaluate its psychometric features among a Syrian population seeking to give additional validation of the Arabic version of the FCV-19S. The study addressed construct and concurrent validity and checked the instrument's reliability with that population.

Methods

Participants

There were 1637 participants who completed the survey. Their demographic characteristics are shown in Table 1. The majority of the respondents were married (57.7%), female (53.1%) and employed (59%). A substantial minority had at least a diploma level education (39.2%). Almost half of the respondents were between the ages of 31 and 50. About one-third earned between 100 and 150 Syrian lira per month. The western part of Syria was the most represented (31.7% of the respondents). About twenty percent of the sample reported having a chronic physical illness and 6.0% reported a mental illness. Fully 9.8% reported having been previously diagnosed with COVID-19, and 12% of the sample reported that a family member had died because of that virus. One-fourth of the participants claimed to have been vaccinated.

Table 1. Demographic characteristics of the participants.

Demographic characteristic		n	%
Age	Less than 30 years	362	22.1
	31–40 years	607	37.1
	41–50 years	444	27.1
	More than 50 years	224	13.7
Gender	Male	768	46.9
	Female	869	53.1
Marital Status	Single	277	16.9
	Married	944	57.7
	Divorced	269	16.4
	Widowed	147	9.0

Education Level	Primary School	42	2.6
	Secondary School	160	9.8
	High School	346	21.1
	Diploma	641	39.2
	Bachelor	382	23.3
	Postgraduate	66	4.0
Employment	Student	100	6.4
	Employed	966	59.0
	Unemployed	434	26.5
	Retired	137	8.3
Monthly Income	<LS50 thousand	85	5.2
	LS50–100 thousand	226	13.8
	LS100–150 thousand	651	39.8
	LS150–200 thousand	522	31.9
	>LS 200 thousand	153	9.3
Region	Northern Region	183	11.2
	Eastern Region	321	19.6
	Central Region	430	26.3
	Western Region	519	31.7
	Southern Region	184	11.2
Chronic Physical illness	Yes	335	79.5
	No	1302	20.5
Mental health illness	Yes	98	94.0
	No	1639	6.0
Previously diagnosed with COVID-19	Yes	161	9.8
	No	1476	90.2
Any of family members died because COVID-19	Yes	196	12.0
	No	1441	88.0
Vaccinated against COVID-19	Yes	415	25.4
	No	1222	74.6

Notes: n=1637 All data self-reported without verification

Measures

Fear of COVID-19 was assessed using a unidimensional seven-item scale developed specifically to measure the level of fear resulting from this pandemic [18]. For example, item 6 was "I cannot sleep because I'm worrying about getting the coronavirus". The statements were graded on a 5-point Likert scale, and the overall score was the sum of the scores on all of the items. The total score could range from 7 to 35, with higher scores indicating greater fear.

Psychological distress was evaluated using the Depression Anxiety and Stress (DASS-21) instrument [31]. The DASS-12 is a self-assessment scale that seeks to evaluate the symptoms of depression, anxiety, and stress experienced by the respondent during the previous week. The scale has 21 items, with 3 subscales consisting of 7 items each. The items are graded on a 4-level scale. The validated Arabic version applied in this study has shown

good internal consistency ($\alpha=0.80$) [32,33] (Appendix 1).

Life satisfaction was evaluated using the Satisfaction with Life Scale (SWLS)

Appendix 1. English version of the Depression, Anxiety and Stress Scale. Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement. The rating scale is as follows: 0 did not apply to me at all 1 Applied to me to some degree, or some of the time 2 Applied to me to a considerable degree or a good part of time 3 Applied to me very much or most of the time.

1	I found it hard to wind down	0	1	2	3
2	I was aware of the dryness of my mouth	0	1	2	3
3	I couldn't seem to experience any positive feeling at all	0	1	2	3
4	I experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion)	0	1	2	3
5	I found it difficult to work up the initiative to do things	0	1	2	3
6	I tended to over-react to situations	0	1	2	3
7	I experienced trembling (e.g. in the hands)	0	1	2	3
8	I felt that I was using a lot of nervous energy	0	1	2	3
9	I was worried about situations in which I might panic and make a fool of myself	0	1	2	3
10	I felt that I had nothing to look forward to	0	1	2	3
11	I found myself getting agitated	0	1	2	3
12	I found it difficult to relax	0	1	2	3
13	I felt down-hearted and blue	0	1	2	3
14	I was intolerant of anything that kept me from getting on with what I was doing	0	1	2	3
15	I felt I was close to panic	0	1	2	3
16	I was unable to become enthusiastic about anything	0	1	2	3
17	I felt I wasn't worth much as a person	0	1	2	3
18	I felt that I was rather touchy	0	1	2	3
19	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat)	0	1	2	3
20	I felt scared without any good reason	0	1	2	3
21	I felt that life was meaningless	0	1	2	3

12). That self-assessment instrument seeks to quantify general satisfaction with life through asking respondents to rate statements such as, "The conditions of my life are excellent." The instrument's 7 items are rated on

a 7-point Likert scale [34]. The SWLS showed a good internal consistency ($\alpha=0.76$) in this study (Appendix 2).

Appendix 2. English version of the satisfaction with Life Scale (SWLS). Instructions: Below are five statements that you may agree or disagree with. Indicate your agreement with each item by tapping the appropriate box, from strongly agree, to strongly disagree. Please be open and honest in your responding.

	Strongly agree	Agree Slightly	Agree	Neither agree nor disagree	Slightly disagree	Disagree Strongly	Disagree
In most ways my life is close to my ideal.	7	6	5	4	3	2	1
The conditions of my life are excellent.	7	6	5	4	3	2	1
I am satisfied with my life.	7	6	5	4	3	2	1
So far, I have gotten the important things I want in life.	7	6	5	4	3	2	1
If I could live my life over, I would change almost nothing.	7	6	5	4	3	2	1

Arabic adaptation of the fear of COVID-19 scale

This study's survey was carried out in Syria. Forward and backward translation was performed following approved guidelines and protocols for cross cultural adaptation as the original version of the scale was translated into Syrian Arabic [18]. The survey was first translated into Arabic by a bilingual medical translator not otherwise involved in the study. That draft of the Arabic version was then reviewed by one of the authors who is fluent in both languages (Arabic and English), and any unclear items, words or

sentences were discussed with the independent medical translator. The consensus Arabic version was then converted back to English by another independent translator unfamiliar with the original English version. After the versions' equivalence and the cultural compatibility of the Arabic version was agreed upon, the approved Arabic version was distributed as a pilot to 20 Syrian persons recruited through Facebook to evaluate the survey's readability and highlight any possible ambiguities. There were no obvious problems, and no more modifications were deemed necessary. The final Arabic version of the FCV-19S is presented in (Appendix 3).

Appendix 3. English version of the COVID-19 fear scale. Please respond to each item by ticking (✓) one of the five (5) responses that reflects how you feel, think or act toward COVID-19.

Fear of COVID-19 Items		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1	I am most afraid of Corona					
2	It makes me uncomfortable to think about Corona					
3	My hands become clammy when I think about Corona					
4	I am afraid of losing my life because of Corona					
5	When I watch news and stories about Corona on social media, I become nervous or anxious.					
6	I cannot sleep because I'm worrying about getting Corona.					
7	My heart races or palpitates when I think about getting Corona.					

Scoring The participants indicates their level of agreement with the statements using a five- item Likert type scale. Answers included “strongly disagree,” “disagree,” “neutral” “agree” and “strongly agree”. The minimum score possible for each question is 1, and the maximum is 5. A total score could be calculated by adding up each item score (ranged from 7 to 35)

Procedure

This study was conducted using a cross sectional design. An anonymous online survey questionnaire was used to collect the data via Google Forms to assure a wide reach and ease of access. The link to the survey was publicized using social media and several online platforms such as WhatsApp and Facebook. Snowball sampling was used to recruit participants. The data collection spanned October 18 to December 10, 2021. Before filling out the questionnaire, a brief introduction explained the aim of the research, the procedures, and how the dataset would be used. Informed consent was then obtained online. The questions solicited demographic information and information about the respondents' self-perceived, self-reported anxiety, depression, and stress and life satisfaction. They were required to answer all of the questions before they could submit their survey, which ensured no missing data. Participation was voluntary and self-selected, and the respondents received no compensation for participating.

Data analysis

This study's statistical analysis used descriptive statistics, reliability, and construct and concurrent validity. Distributions of the responses, including kurtosis and skew were computed. Internal consistency was quantified using Cronbach's alpha [35,36]. Content validity was determined by assessing the linear correlation between the FCV 19S and subscales of the DASS and life

satisfaction instruments.

The dimensionality of the Syrian FCV-19S was evaluated through exploratory factor analysis (EFA), and confirmatory factor analysis (CFA) was used with maximum likelihood to evaluate the model's suitability using version 21 of the AMOS software suite. Other data analyses were carried out with the help of version 25.0 of the SPSS software package.

Results

The previously summarized demographic characteristics of the participants are shown in detail in Table 1. Table 2 presents some statistics describing the means, standard deviations, kurtosis, and skew of the responses. All were normally distributed with skew and kurtosis close to zero; according to Byrne and Campbell, a normal distribution could be achieved when the skewness and kurtosis values are near to zero (from -1.5 to 1.5) [37]. The internal consistency of the Syrian FCV 19S was computed as 0.84. Table 2 presents the values of Cronbach's alpha when an item is deleted (range 0.81 to 0.83) and the factor loading values (range 0.67 to 0.78). These results indicate that the scale was consistently distributed and did not have any over dependency on any one item. Table 3 shows the inter item correlations. The range (from 0.55 to 0.68) shows that there was a strong positive association among the items.

Table 2. Descriptive statistics for the items of the FCV-19S.

Item	Mean	S.D.	Factor loading	Variance	Skew	Kurtosis	Cronbach's alpha with the item deleted
Item 1	3.88	1.19	.764	1.42	-.91	-.10	.815
Item 2	3.95	1.20	.687	1.45	-.100	-.00	.829
Item 3	3.23	1.21	.731	1.47	-.09	-.94	.821
Item 4	3.84	1.16	.784	1.35	-.71	-.48	.810
Item 5	3.13	.88	.683	.77	-.75	-.26	.830
Item 6	3.17	1.26	.676	1.58	-.07	-1.01	.831
Item 7	3.03	1.04	.726	1.09	-.33	-.68	.822

Note: S.D. standard deviation

Table 3. Inter-item Pearson correlation matrix and corrected item-total correlations.

Item	Item 1	Item 2	Item 3	Item 4	Item 5	Item 6	Item 7	Corrected item total correlations
Item 1	1.000							.646

Item 2	.500**	1.000						.559
Item 3	.472**	.298**	1.000					.613
Item 4	.566**	.617**	.428**	1.000				.680
Item 5	.497**	.407**	.410**	.446**	1.000			.550
Item 6	.359**	.328**	.515**	.434**	.315**	1.000		.555
Item 7	.432**	.331**	.569**	.433**	.404**	.501**	1.000	.612

**Statistically significant at the $p \leq 0.01$ level of confidence (2-tailed)

The FCV-19S's construct validity in the Syrian context was evaluated in terms of the linear correlation between FCV 19S ratings and subscales of the DASS and life satisfaction instruments. The FCV-19S results were substantially associated with the three subscales of the DASS, with the highest association being with the anxiety subscale ($r=0.25$, $p \leq 0.001$),

followed by the stress subscale ($r=0.20$, $p \leq 0.001$), and the depression subscale ($r=0.15$, $p \leq 0.001$). The association between FCV-19S responses and life satisfaction was also found to be substantial in this study ($r=-0.37$, $p \leq 0.001$) (Table 4).

Table 4. Correlation between FCV-19S and validating variables.

		1	2	3	4	5
1	Fear of COVID-19	1.000				
2	DASS Anxiety subscale	.223**	1.000			
3	DASS Stress subscale	.205**	.703**	1.000		
4	DASS Depression subscale	.154**	.531**	.530**	1.000	
5	Life satisfaction	-.371**	.128**	.091**	.271**	1.000

**Statistically significant at the $p \leq 0.01$ level of confidence (2-tailed)

The exploratory factor analysis (EFA) was used to confirm the unidimensionality of the Arabic version's factor structure. The confirmatory factor analysis (CFA) with maximum likelihood estimation was used to evaluate the fit of the model using the goodness of fit index (GFI ideally 0.80), the Tucker-Lewis index (TLI 0.90), the comparative fit index (CFI

0.90), the root mean square error of approximation (RMSEA 0.08), and the standardized root mean square residual (SRMR 0.06) [38]. Model (1) of CFA shows the fit indices of the initial model before modification. All of the items were within a permissible level except the SRMR and RMSEA (>0.10) and the TLI (<0.90) (Table 5).

Table 5. Model fit indices for a one-factor model of the Arabic FCV-19S instrument.

Model	GFI	TLI	CFI	RMSEA	SRMR
Model 1 (Initial model)	0.95	0.73	0.82	0.09	0.11
Model 2 (Modified model)	0.99	0.97	0.99	0.05	0.02

CFI comparative fit index, TLI Tucker-Lewis index, RMSEA root mean square error of approximation, SRMR standardized root mean squared residual

The patterns of modification indices and inter item correlations revealed the existence of significant error variance within the group comprising items 2–7. Model (2) shows the items after the correlation of the error variance. The RMSEA and SRMR decreased significantly (they were below the acceptable cut-off value 0.06), and the TLI had increased significantly Table 5. The factor solutions for models (1) and (2) are depicted in (Figures 1 and 2). The figures show that the factor loadings for model (1) (from 0.67 to 0.78) were slightly higher than those for model (2) (from 0.58 to 0.77), but in both cases they indicate the scale's good psychometric performance.

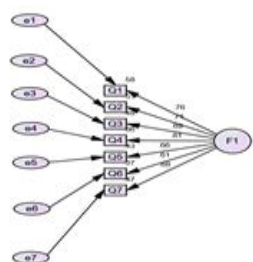


Figure 1. Baseline model with no covariances correlated F1: FVC-19S, Q: the question of the FCV-19 S, e: observed variables.

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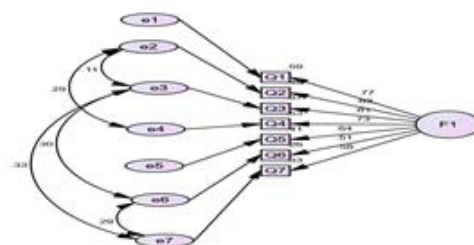


Figure 2. Model 2 with covariances between Q2, Q3, Q4, Q5, Q6, and Q7 F1: FVC-19S, Q: the question of the FCV-19 S, e: observed variables.

Discussion

The study's objective was to assess whether or not the Syrian Arabic version of the FCV-19S might be a reliable tool for validly evaluating the severity of fear of COVID-19 among the general population in Syria. Tests with 1637 Syrians showed that the Syrian Arabic FCV-19S has a uni-dimensional

structure, satisfactory internal consistency, and acceptable concurrent and construct validity.

The instrument's internal consistency was computed as 0.84. That is in line with the findings of previous studies in which internal consistencies of $\alpha=0.91$ were reported in the United States [39] and Jordan, $\alpha=0.89$ [40] in Malaysia [41], 0.88 in Saudi Arabia [27] and Spain [28], 0.87 in Italy [42], Bangladesh [26], Greece [43] and Egypt [44], 0.86 in Israel [24], 0.85 in Turkey [20], and $\alpha=0.82$ in Japan [29].

In terms of concurrent validity, the data show that the FCV-19S has a significant positive association with the anxiety, depression, and stress items of the DASS-21. People feeling strongly fearful are much more susceptible to experiencing depression, anxiety, or at least stress [28]. This reinforces the conclusions of previous research to the effect that prolonged infections are fertile ground for the emergence of psychophysical and mental health problems such as phobias, depression, anxiety, and fear [7,16,23,43,45-47]. Higher FCV-19S scores predict higher DASS subscale scores. Despite being meaningful, but the correlations between FCV-19S and the anxiety ($r=.25$), stress ($r=.20$), and depression ($r=.15$) were moderate. This demonstrates that the FCV-19S and DASS subscales have considerable unshared variation, implying that they represent more than one underlying construct. The FCV-19S may thus provide some variation to the constructs of total depression and anxiety [47]. The data also show that FCV-19S readings have a significant negative association with life satisfaction (as measured using the SWLS). That too confirms the findings of previous research [44,48].

The EFA results confirm that the Syrian Arabic version of the FCV-19S developed here has a one factor structure, and the CFA findings show that the one factor model has good fit. A similar one factor structure has been observed in the Bangladeshi [26], Italian [42], Saudi Arabian [49], American [47], Greek [43], Malaysian [41] and Egyptian [44] versions. A two factor structure has, however, been observed in studies conducted in Israel [24], Japan [29], China [29], and Spain [28].

The impacts of this pandemic are not only psychological and physical. It raises a lot of social and economic issues, especially in a country like Syria burdened by civil war. The poor and deteriorating economic and health situation must surely increase stress and fear among the population, especially the lack of sufficient beds and medical equipment to deal with COVID-19 patients. Such fear ultimately affects negatively both medical personnel and the general population [38,50]. Additionally, stress and fear are associated with an increased use of alcohol and drugs [42]. That too can negatively impact people's health, making them vulnerable to infection [42].

These findings provide concrete evidence for the psychometric characteristics of the Syrian Arabic FCV-19S instrument, supplementing the psychometric assessments conducted in Egypt [44], Jordan [40], and Saudi Arabia [49]. They also further support the FCV-19S studies undertaken in Bangladesh [26], Italy [42], the U.S [39], Iran [18], Japan [29], Spain [28], Turkey [20], Malaysia [41], and China [30]. They will help researchers to perform national and international comparative studies on fear of COVID-19 among different populations.

The findings of this study should, however, be considered in light of certain limitations. First, self-reporting always entails a risk of biases. Socially desirable responding is always a risk. Future studies should use different protocols to check on this. Also, this survey adopted a cross-sectional design in a specific geographic region. Certainly, the data represent only perceptions at a particular time and place. Future longitudinal studies with a wide geographic scope are recommended to generate clearer findings. And of course, snowball sampling always poses a risk of selection bias. Only people who received the link from a friend had the opportunity to participate in this survey.

Conclusion

In conclusion the Syrian Arabic version of the FCV-19S instrument has acceptable validity and reliability. It can be used to assess the fear of COVID-19 among Syrians. For Syrians, fear of COVID-19 has a substantial negative association with life satisfaction and a positive association with depression, anxiety, and stress.

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Conflicts of Interest

Authors have no conflict of interests to declare.

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Data Availability

The generated dataset from this trial is available from the corresponding author on reasonable request.

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