



A longitudinal study of mental health before and during the COVID-19 pandemic in Syrian refugees

Aemal Akhtar ^{a,b}, Ahmad Bawaneh^c, Manar Awwad^c, Hadeel Al-Hayek^c, Marit Sijbrandij ^b, Pim Cuijpers ^b and Richard A. Bryant ^a

^aSchool of Psychology, University of New South Wales, Sydney, Australia; ^bDepartment of Clinical, Neuro and Developmental Psychology, World Health Organization Collaborating Center for Research and Dissemination of Psychological Interventions, Amsterdam Public Health Research Institute, Vrije Universiteit Amsterdam, Amsterdam, The Netherlands; ^cJordan Country Office, International Medical Corps, Amman, Jordan

ABSTRACT

Background: The COVID-19 pandemic has resulted in increased anxiety and depression around the world. Refugees may be particularly vulnerable to the mental health effects of the pandemic because of their higher rates of mental health disorders, trauma histories, and daily stressors.

Objectives: This study used data from a controlled trial of a brief behavioural intervention for psychological distress in Syrian refugees living in Azraq Camp in Jordan to examine the psychological effects of the pandemic on refugee mental health.

Method: A total of 410 participants were randomized to either the intervention or control arms of the trial and were assessed at baseline and 3-month follow-up. Half the sample (199; 48.5%) completed their 3-month follow-up assessment after the pandemic restrictions began in Jordan and 211 (51.5%) completed the assessment prior to the pandemic. Refugees were independently assessed for symptoms of PTSD, anxiety, and depression at baseline and follow-up, and pandemic-related worries were assessed at follow-up for those who completed their assessment during the pandemic.

Results: The most commonly reported worries were economic difficulties (82.4%), shortage of essential supplies (71.3%), and infecting others (59.7%) or themselves (51.9%). Refugees who were assessed during the pandemic had less severe PTSD symptoms than those assessed prior to the pandemic. Significant predictors of pandemic-related worries were lower levels of depression prior to the pandemic and greater anxiety during the pandemic.

Conclusion: These findings highlight the specific needs of refugees during the pandemic and suggest that pre-existing mental health issues may not necessarily be the key risk factors for who will experience major mental health issues or worries during the pandemic.

Un estudio longitudinal de la salud mental antes y durante la pandemia por la COVID-19 en refugiados sirios

Antecedentes: La ansiedad y la depresión alrededor del mundo se han incrementado como consecuencia de la pandemia por la COVID-19. Los refugiados pueden ser particularmente vulnerables a los efectos de la pandemia sobre la salud mental a sus tasas más altas de trastornos de salud mental, de antecedentes de trauma y de estresores diarios.

Objetivos: Este estudio empleó los datos del ensayo controlado de una intervención conductual breve para la angustia psicológica en refugiados sirios que vivían en el campo Azraq en Jordania. Se buscó evaluar los efectos psicológicos de la pandemia sobre la salud mental de los refugiados.

Método: Un total de 410 participantes fueron asignados aleatoriamente, bien al grupo de intervención o bien al grupo de control del ensayo, y fueron evaluados al inicio y a los 3 meses de seguimiento. La mitad de la muestra (199; 48,5%) completó la evaluación a los 3 meses de seguimiento después de que comenzaran las restricciones de la pandemia en Jordania, mientras que 211 (51,5%) completaron esta evaluación antes de la pandemia. Los refugiados fueron evaluados de forma independiente para detectar síntomas del TEPT, de la ansiedad y de la depresión al inicio y en el seguimiento. Las preocupaciones relacionadas a la pandemia se evaluaron durante el seguimiento en aquellos que completaron su evaluación durante la pandemia.

Resultados: Las preocupaciones más comúnmente reportadas fueron las dificultades económicas (82,4%), la escasez de suministros esenciales (71,3%) y la infección de otros (59,7%) o de ellos mismos (51,9%). Los refugiados que fueron evaluados durante la pandemia tenían síntomas de TEPT menos severos que aquellos que fueron evaluados antes de la pandemia. Los predictores significativos de las preocupaciones relacionados con la pandemia

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关键词

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HIGHLIGHTS

- This study examined effects of the COVID-19 pandemic on refugee mental health before and after the pandemic.
- PTSD severity decreased more in people exposed to the pandemic than those who were not.
- Great pre-pandemic depression predicted fewer pandemic-related worries.

fueron niveles más bajos de depresión antes de la pandemia y mayor ansiedad durante la pandemia.

Conclusiones: Estos hallazgos destacan las necesidades específicas de los refugiados durante la pandemia y sugieren que los problemas de salud mental preexistentes no necesariamente pueden ser los factores de riesgo clave para aquellos que experimentarán los principales problemas de salud mental o preocupaciones durante la pandemia.

项关于叙利亚难民在 COVID-19 疫情之前和期间心理健康的纵向研究

背景: COVID-19 疫情导致全世界的焦虑和抑郁增加。难民可能特别容易受到疫情的心理影响，因为他们的精神健康障碍，创伤史和日常应激因素的发生率较高。

目的: 本研究使用了一项来自居住在约旦 Azraq 难民营的叙利亚难民心理困扰的简短行为干预对照试验的数据，以考查疫情对难民心理健康的心理影响。

方法: 总共 410 名参与者被随机分配到试验干预组或对照组，并在基线和 3 个月的随访中进行评估。一半的样本 (199; 48.5%) 在约旦开始疫情限制后完成了其 3 个月的随访评估，211 (51.5%) 在疫情之前完成了评估。在基线和随访时独立评估难民的 PTSD，焦虑和抑郁症状，并在随访时评估那些在疫情期间完成评估者的疫情相关担忧。

结果: 最常报告的担忧是经济困难 (82.4%)，必需品短缺 (71.3%)，和感染他人 (59.7%) 或自己 (51.9%)。疫情期间评估的难民的 PTSD 症状不如疫情之前评估的人严重。疫情相关担忧的显著预测因素是疫情之前较低的抑郁程度和疫情期间的较高的焦虑水平。

结论: 这些发现强调了疫情期间难民的特定需求，表明先前存在的心理健康问题可能不一定是谁将在疫情期间遇到重大心理健康问题或担忧的关键风险因素。

1. Introduction

There are approximately 80 million people forcibly displaced from their homes, over 25 million of whom are registered refugees in a foreign country (UNHCR, 2020a). The largest group of refugees are people fleeing the civil war in Syria, with 83% of the nearly 7 million Syrian refugees residing in the directly neighbouring countries of Turkey, Lebanon, and Jordan (UNHCR, 2020b). Refugees represent one of the most psychologically vulnerable groups in the world today. Refugees are known to be significantly exposed to a wide range of traumatic events, including war, imprisonment, torture, forced separation from home and social networks, and dangers during emigration (Morina et al., 2018). The effects of these experiences can be compounded by post-migration stressors in the host country, especially for refugees residing in camps, where they can face restricted movement, limited communications and internet access, scarcity of resources, and limited employment opportunities (Miller & Rasmussen, 2010; Riley, Varner, Ventevogel, Taimur Hasan, & Welton-Mitchell, 2017). Unsurprisingly, there is much evidence that people exposed to these conditions are at greater risk of common mental disorders, such as anxiety, depression, and post-traumatic stress disorder (PTSD) (Charlson et al., 2019).

One of the major concerns since the onset of the COVID-19 pandemic has been the vulnerability of refugees to the effects of restrictions and economic consequences. Many large-scale studies have been published documenting the anxiety and mood problems associated with the pandemic (da Silva & Neto, 2021; Salehi et al., 2021; Wu et al., 2021). Longitudinal cohort studies that assessed people's mental health prior to and during the pandemic have reported marked increases in anxiety, depression, and post-traumatic stress (Pierce et al., 2020).

Interestingly, longitudinal evidence suggests greater increases in psychological distress in people without prior mental disorders relative to those with previous disorders (Pan et al., 2021). Commentators have expressed concerns that refugees may be particularly susceptible to pandemic-related stressors because government initiatives may trigger traumatic memories of persecutory government activities, lockdowns may contribute to social isolation and loneliness, impacts on health services may impede access to mental health services, overcrowding may limit refugees' capacity to follow social distancing, and they may be particularly vulnerable to economic downturns arising from the pandemic (Brickhill-Atkinson & Hauck, 2021; Rees & Fisher, 2020). In this context, multiple studies have indicated elevated rates of depression and anxiety in Middle Eastern countries hosting Syrian refugees during the pandemic, including Jordan (Al-Ajlouni et al., 2020; Naser et al., 2020) and Lebanon (Hajjar & Abu-Sittah, 2021). There is also initial evidence that refugees are experiencing marked anxiety and mood problems during the pandemic (Aragona et al., 2021; Hajjar & Abu-Sittah, 2021).

During the early stages of the COVID-19 pandemic, Jordan imposed strict lockdown measures as a preventative strategy to mitigate the impacts of the virus. The first case of COVID-19 was identified on 2 March 2020 and within 2 weeks, all borders and schools were closed to prevent further spread (Al-Tammemi, 2020). Within 3 weeks, the Jordanian government declared a state of emergency and issued a nationwide lockdown (Khatatbeh, 2021). This had a significant effect on refugee populations, with those residing in camps feeling the impact the greatest as they were effectively left isolated from the rest of the country (Jensehaugen, 2020). Due to

the enforcement of these restrictions, refugees residing in camp settings had minimal movement both within and outside of the camp.

There is a need for a better understanding of how the pandemic is affecting refugee populations, especially those who have been exposed to significant trauma and are still living under conditions of adversity. To this end, this study describes a study of Syrian refugees residing in a camp in Jordan who were assessed prior to the pandemic as part of a clinical trial, and again during the height of the pandemic in Jordan. Half of the sample received their follow-up assessment prior to the pandemic, and half were assessed after Jordan imposed strict COVID-19 measures, including nationwide lockdowns and full-day curfews, border closures, and the banning of large gatherings (Khatatbeh, 2020). This situation allowed for a natural experiment to map the relative effects of the pandemic on mental health impacts over time, and also to determine the relationship between pre-existing mental health issues and subsequent concerns about the pandemic.

2. Methods

2.1. Study design

This two-arm, single-blind RCT was conducted in Azraq Refugee Camp in Jordan. The full trial protocol has been previously published (Akhtar et al., 2020). There are currently more than 650,000 Syrians formally registered as refugees in Jordan; however, it is estimated that more than 1.4 million Syrians are currently residing in the country (Jordan Ministry of Planning and International Cooperation, 2018; United Nations High Commissioner for Refugees (UNHCR), 2019). Azraq Camp is the second largest in Jordan and hosts approximately 36,000 Syrians, of which 60% are children (UNHCR, 2020c). There is limited access to the internet and employment opportunities, and restricted internal and external mobilities due to high levels of camp security. There are currently 8,660 caravans, housing up to a maximum of six family members, that are in use across four residential villages, two of which were used to recruit participants for this study. The trial was approved by the Ministry of Planning and International Cooperation in Jordan, and research ethics were approved by the University of New South Wales and the Institutional Review Board of the King Hussein Cancer Centre. The trial was prospectively registered on the Australian New Zealand Clinical Trials Registry (ACTRN12619000168156) on 5 February 2019. The study was conducted in collaboration with the Jordan country office of International Medical Corps (IMC).

2.2. Participants

Door-to-door screening of consecutive caravans was conducted in the camp by Arabic-speaking assessors

between August and December 2019. Participants were invited to the trial if they met the following criteria: (a) aged ≥ 18 years, b) scored ≥ 16 on the Kessler Psychological Distress Scale (K10 (Kessler et al., 2002)), (c) scored ≥ 17 on the WHO Disability Assessment Schedule 2.0 (WHODAS (WHODAS Group, 2000)), and (d) had a child between the ages 10 and 16 years. Participants were randomly allocated (on a 1:1 ratio) to either a 5-week group behavioural intervention (Group Problem Management Plus (gPM+) (Dawson et al., 2015)) or enhanced usual care (EUC). The gPM+ programme consisted of five 2-hour group sessions conducted weekly, and integrates problem-solving and behavioural activation techniques. Participants in the intervention were taught four strategies: (1) stress management, (2) problem management, (3) behavioural activation, and (4) skills to strengthen social support. Those who were randomized to EUC received a 15-minute home visit from IMC psychosocial support staff and were provided information on the available mental health and psychosocial support services in the camp, as well as information on other health, parenting, and vocational training activities.

The sample size was based on a power analysis that aimed for a medium Cohen's d effect size of 0.4 in the intervention arm at 3-month follow-up (the primary outcome timepoint) and required a minimum sample size of 133 participants per arm (power = 0.90, $\alpha = 0.05$, two-sided). The estimate of a medium effect Cohen's d was based on prior trials of PM+ (Bryant et al., 2017; Rahman et al., 2019). With an expected 35% attrition at 3-month follow-up, a total number of 410 participants were enrolled.

2.3. Assessments

All assessments were conducted by Arabic-speaking Jordanians, who received 4 days of training in research ethics, psychological first aid, the assessment battery, and general interviewing techniques. Assessments were conducted on portable tablets to ensure that data could be reliably collected and uploaded. Questionnaires were administered remotely for half the sample who participated in assessments during the COVID-19 pandemic. Assessments were conducted at baseline, at 6 weeks (1-week post-intervention), and at 18 weeks (3-month post-intervention) (Figure 1); the 18-week assessment was the primary outcome time point. Baseline assessments were conducted between September 2019 and January 2020, 6-week assessments were conducted between November 2019 and March 2020, and 18-week assessments were conducted between January and June 2020. 18-week assessments that were conducted between January and February were considered pre-pandemic follow-up assessments, and assessments conducted in May and June were considered during pandemic assessments. Participants were aware of

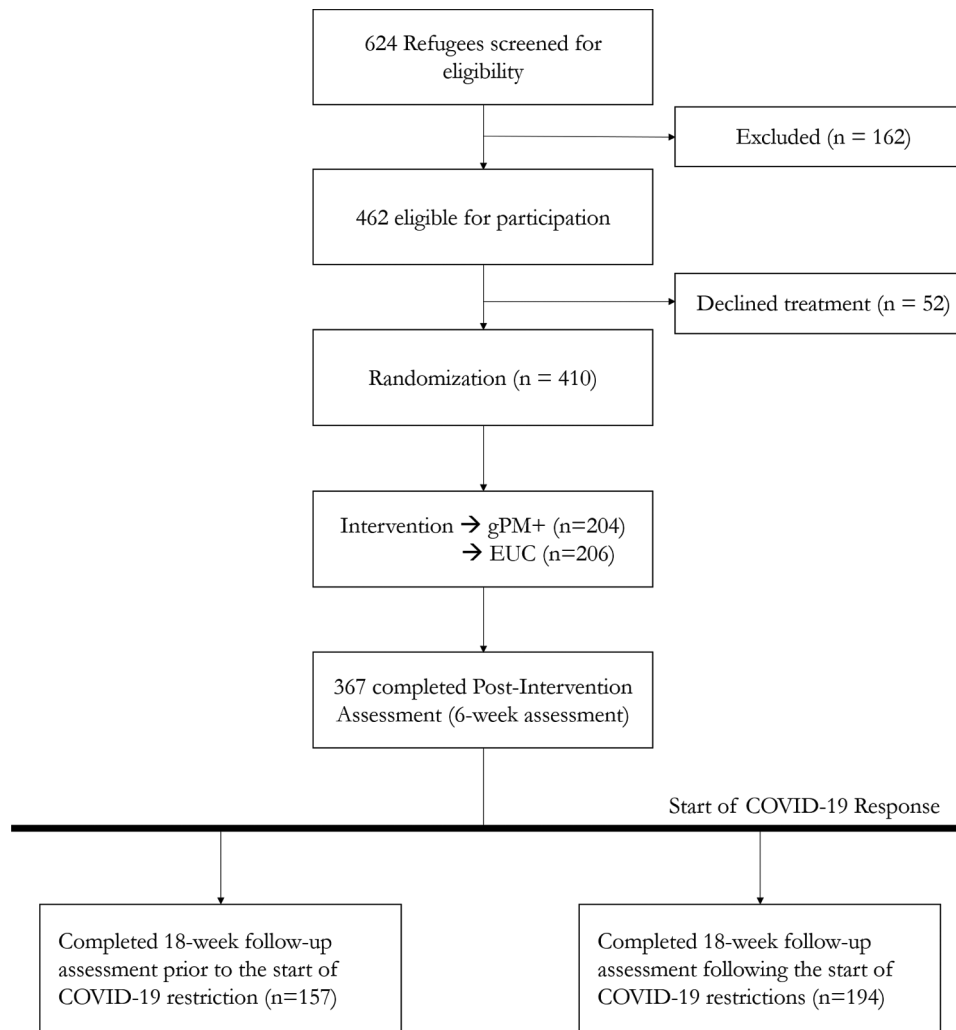


Figure 1. Flow diagram of study procedure.

treatment allocation but research assessors were blinded to treatment condition. All participants completed their baseline and 6-week (post-intervention) assessments prior to the pandemic. Approximately half the sample (199; 48.5%) completed their 18-week assessment during the pandemic and 211 (51.5%) completed theirs prior, which allowed for the calculation of pre- and post-pandemic levels of mental health symptoms.

2.3.1. Outcomes

The primary outcome was the total score for anxiety and depression, respectively, measured by the Hopkins Symptom Checklist-25 (HSCL-25) (Derogatis, Lipman, Rickels, Uhlenhuth, & Covi, 1974). The HSCL-25 comprises 25 questions that are rated on a 4-point scale (1 = *not at all*, 4 = *extremely*), with higher total scores reflecting more impairment or distress caused by symptoms of anxiety and depression. The HSCL-25 has previously been validated across many cultures, including in Arabic contexts (Mahfoud et al., 2013). The internal consistency of the HSCL-25 in the current sample was

robust for the anxiety (Cronbach's alpha = 0.79) and depression (Cronbach's alpha = 0.84) scales, respectively. For the purpose of the current study, we also report secondary outcome measures of PTSD symptoms (Federici, Bracalenti, Meloni, & Luciano, 2017). PTSD symptoms were assessed using the PTSD Checklist for DSM-5 (PCL-5) (Weathers, Keane, Palmieri, Marx, & Schnurr, 2013), which is a 20-item checklist corresponding to the 20 DSM-5 symptoms of PTSD. Items are rated on a 5-point scale, with higher scores indicating worse PTSD symptoms. To assess concerns related to COVID-19, a measure was constructed to index possible concerns that refugees may experience in the wake of the pandemic. Ten items indexed to the extent respondents were worried about a range of pandemic-related stressors on a 5-point scale (0 = *not at all*, 4 = *extremely*), with a higher score reflecting more severe worry; this scale had strong internal consistency in the current sample (Cronbach's alpha = 0.83). An exploratory factor analysis indicated that these items formed a single factor (eigenvalue = 4.64). This scale was only administered at the follow-up (18-week) assessment, when Jordan had

implemented national restrictions in response to the pandemic and only to participants who completed their assessment during this time.

2.4. Statistical analyses

Using a two-way analysis of covariance (ANCOVA), we initially compared the reported severity of anxiety, depression, and PTSD symptoms at 6-week follow-up and 18-week follow-up for participants who completed their follow-up assessments either before or after the pandemic. This approach was taken to determine if the pandemic affected reported levels of psychological problems relative to before. Considering that these data were obtained from participants in a controlled trial, analyses were adjusted for treatment allocation. Additionally, to evaluate whether age, gender, marital status, or the time since participants left Syria impacted the results of ANCOVA, secondary analysis was conducted to adjust for these covariates.

Proportions of participants reporting each pandemic-related worry are also reported; participants were deemed to be sufficiently worried for each item if they recorded a score either a 3 ('quite worried') or 4 ('extremely worried'). Finally, to examine the extent to which pre-existing (i.e. baseline levels) psychological functioning influenced pandemic-related worries, we conducted a hierarchical regression analysis that controlled for intervention arm, baseline PTSD, anxiety, and depression symptom severity, as well as follow-up PTSD, anxiety, and depression symptom severity into the model to predict total score of pandemic worries.

3. Results

3.1. Participant characteristics

There were 624 participants that took part in the screening procedure. Of those who were screened, 446 (71.5%) were female, and the average age was 40.4 years ($SD = 7.1$). A total of 462 (74.0%) met entry criteria, of whom 410 proceeded to randomization. Participant characteristics are presented in Table 1 according to whether they completed their 18-week assessment prior to or during the pandemic. A series of planned comparisons were conducted that adopted a Holm–Bonferroni adjustment to allow for multiple comparisons ($\alpha = 0.005$). Participants who were assessed during the pandemic were more likely to be female and married than those who were assessed pre-pandemic.

3.2. Course of psychological outcomes over time

The means of PCL, HSCL-Anxiety, and HSCL-Depression scores are presented in Table 2. A 2 (Pandemic Affected) \times 2 (Assessment Time) repeated measures ANCOVA, adjusted for intervention arm, of PCL scores indicated main effects for Assessment Time [$F(1, 349) = 38.60, p < .001, \eta^2 = .10$] and a Pandemic Affected \times Assessment Time interaction [$F(1, 349) = 12.65, p < .001, \eta^2 = .04$]. Specifically, there was a greater decrease in PTSD severity in people assessed during the pandemic than those assessed prior to the pandemic. A comparable ANCOVA of HSCL-Anxiety scores indicated a main effect for Assessment Time [$F(1, 349) = 9.64, p = .002, \eta^2 = .03$]. Overall, participants reported less anxiety at follow-up than at baseline. ANCOVA HSCL-Depression

Table 1. Participant characteristics at baseline assessment.

	Follow-up Assessed Before Pandemic (<i>n</i> = 199)	Follow-up Assessed During Pandemic (<i>n</i> = 211)	<i>t</i> / χ^2	<i>p</i> -value
Age (years), mean (SD)	40.56 (7.35)	39.47 (6.47)	−1.59	0.11
Female, <i>n</i> (%)	139 (65.9)	161 (80.9)	11.78	<0.001*
Married, <i>n</i> (%)	203 (96.2)	173 (86.9)	11.58	<0.001*
High school education, <i>n</i> (%)	139 (65.9)	117 (58.8)	2.19	0.14
Time since leaving Syria (years), mean (SD)	6.21 (1.71)	5.53 (1.54)	4.19	<0.001*
Baseline PCL-5 scores, mean (SD)	27.69 (15.76)	24.92 (13.08)	1.93	0.06
Baseline HSCL-Anxiety, mean (SD)	24.59 (6.22)	25.25 (6.15)	1.08	0.28
Baseline HSCL-Depression, mean (SD)	36.98 (9.18)	34.67 (8.83)	2.59	0.01
Trauma exposure total, mean (SD)	7.91 (4.27)	7.41 (3.83)	1.25	0.21

HSCL = Hopkins symptoms checklist, *n* = sample size, PCL-5 = PTSD Checklist for DSM-5, SD = standard deviation. * = significant at 0.05 level adjusted by Bonferroni–Holm method.

Table 2. Mean scores for PTSD, anxiety, and depression severity prior to and during the pandemic.

	Follow-up Assessed Before Pandemic (<i>n</i> = 157)		Follow-up Assessed During Pandemic (<i>n</i> = 194)	
	Post-Assessment	Follow-up	Post-Assessment	Follow-up
PCL-5 scores, mean (SD)	18.64 (15.48)	16.01 (14.51)	15.49 (12.96)	5.85 (10.38)
HSCL-Anxiety, mean (SD)	21.08 (6.87)	20.06 (6.61)	21.41 (6.73)	19.69 (6.52)
HSCL-Depression, mean (SD)	32.32 (10.25)	30.90 (9.70)	30.18 (9.55)	29.54 (9.60)

HSCL = Hopkins symptom checklist, PCL-5 = PTSD Checklist for DSM-5, SD = standard deviation.

scores indicated no effects for Assessment Time or Pandemic Affected status. Adjusting for age, gender, marital status, and time since leaving Syria did not have an impact on the results of the primary analysis.

3.3. Pandemic-related worries

In terms of participants' reports of COVID-19 worries, the most common worries were financial implications (165, 82.9%), shortages of essential supplies (145, 72.9%), infecting others (121, 60.8%), health of family members outside the camp (110, 55.3%), being infected themselves (105, 52.8%), being restricted to one's caravan (94, 47.2%), being quarantined (79, 39.7%), the stigma of being infected (78, 39.2%), government management of the pandemic (72, 36.2%), and capacity of the local health system (65, 32.7%).

3.4. Predictors of pandemic-related worries

Table 3 presents a summary of the hierarchical regression models evaluating predictors of pandemic-related worries. The final model accounted for 21% of the variance. Higher levels of anxiety at follow-up (HSCL-Anxiety; $\beta = 0.52$, $p < .001$) were a significant predictor of pandemic related worries. That is, COVID-19 worries were associated with higher levels of anxiety during the pandemic.

4. Discussion

This study reports the impact of COVID-19 on the mental health of refugees hosted in a secure camp, and therefore subject to a unique set of stressors during the pandemic. Apart from being exposed to a wide array of severe traumatic events in recent years and associated post-traumatic mental health problems, these participants also faced challenges concerning limited access to supplies, inability to practice social distancing, and restricted capacity to learn about the wellbeing of family outside the camp, including those in Syria. The major concerns involved financial concerns, lack of essential supplies, and infection of themselves and others. Concerns about economic wellbeing and capacity to access resources are common among many refugees under normal circumstances (Miller, Omidian, Rasmussen, Yaqubi, & Daudzai, 2008); however, it seems that these worries are exacerbated as a result of problems

Table 3. Summary of hierarchical regression model for pandemic-related worries.

	<i>B</i>	SEB	β	<i>p</i>
Intervention arm	-0.50	1.23	-0.03	.68
Baseline PTSD	0.08	0.06	0.12	.18
Baseline Anxiety	-0.07	0.14	-0.05	.61
Baseline Depression	-0.09	0.10	-0.09	.38
Follow-up PTSD	0.07	0.06	0.08	.29
Follow-up Anxiety	0.73	0.13	0.52	<.001
Follow-up Depression	-0.07	0.10	-0.07	0.48

caused by lockdowns in the camp during the pandemic. It is important to note that refugees in camps such as these cannot seek supplies elsewhere because they are confined to the camp. In turn, they are reliant on the limited supplies made available to them by camp authorities and nongovernmental organizations operating within the camp. Concerns about infection and infecting others were also very common, which may be attributed to the difficulty in maintaining social distancing in the camp. Families of up to six people live within a single caravan, and this level of overcrowding creates marked challenges for achieving the level of distancing that can be maintained in many other settings affected by the pandemic.

Interestingly, refugees who were assessed during the pandemic reported a greater decrease in their PTSD symptom severity than those followed up prior to the onset of COVID-19 in Jordan. This finding was unexpected in the context of numerous commentaries predicting that pre-existing psychological vulnerability would be a significant risk factor for worse mental health during the pandemic (Lancet, 2020; Yao, Chen, & Xu, 2020). The observed finding is consistent to an extent with data from prospective Dutch cohort studies that reported decreases in depression and worry during the pandemic in people who had the most severe mental health problems before the pandemic (Pan et al., 2021). The pattern observed in this study may be attributed to several factors. First, lockdowns in the camp may have limited activities and restricted people to their caravans, which could limit access to triggers that may activate traumatic memories or other PTSD symptoms. Second, restrictions in the camp may have provided a sense of safety for people with PTSD symptoms because remaining in the relative safety of their own home may have provided them with a sense of security (Pelto-Piri, Wallsten, Hylén, Nikban, & Kjellin, 2019). Third, being confined to one's caravan or other limited social activities may have afforded those refugees with pre-existing PTSD symptoms a sense of reassurance; observing restricted lifestyles that other refugees were experiencing during the pandemic may have normalized the limited activity schedules that they were facing, and this development could be reassuring for those refugees whose prior PTSD limited their activities (Brooks et al., 2020).

In terms of the predictors of pandemic worries, the finding that current anxiety was strongly associated with the degree of worry is not surprising considering the overlap of these constructs. Moreover, there is strong evidence that people with higher levels of anxiety are prone to worry (Newman, Llera, Erickson, Przeworski, & Castonguay, 2013), and this relationship has been repeatedly noted in populations affected by the pandemic (Rogers et al., 2021; Taylor, Landry, Paluszek, Rachor, & Asmundson, 2020).

We note several limitations to the study. First, these data were drawn from a controlled trial that was conducted before and during the pandemic. Whilst this afforded us a natural experiment to longitudinally study the effects of the pandemic, it introduced a potential confounding of refugees receiving either the intervention or control arms of the trial. Although we controlled for this factor in all analyses, the randomization into different conditions may have impacted outcomes. Moreover, our design does not allow us to draw inferences about the natural course of mental health prior to and during the pandemic because participants were not representative of all refugees in the camp as they were pre-selected on psychological distress. Relatedly, participation in the trial may have impacted reduced mental health problems in both arms and could be attributed in part to the expected regression of the mean. Second, the measure used to assess pandemic-related worries was developed for this study and lacks psychometric validation. Third, the methodologies used to collect the data differed prior to and during the pandemic as remote telephone assessments for data collection were necessitated due to restrictions in the camp. Finally, for those who completed the 3-month follow-up prior to the onset of the COVID-19 restrictions, the assessment did not discuss stressors that may have occurred following the intervention. In turn, we were unable to control for stressors that this group may have experienced.

In conclusion, this study provides important information that is relevant to refugees worldwide during the pandemic. This group is susceptible to many stressors under normal circumstances, and these stressors can be heightened during the pandemic because of overcrowding, economic restrictions, and shortage of supplies. The current data suggests that pre-existing levels of PTSD and depression symptoms do not necessarily lead to worsened mental health during the pandemic. Instead, many refugees are at risk of excessive worry and anxiety, and those more at risk may be those refugees with less severe psychological distress prior to the pandemic.

Availability of data and materials

All data has been made publicly available via Figshare and can be accessed at DOI 10.6084/m9.figshare.14442758.

Disclosure statement

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ORCID

Aemal Akhtar  <http://orcid.org/0000-0002-8510-3636>
 Marit Sijbrandij  <http://orcid.org/0000-0001-5430-9810>
 Pim Cuijpers  <http://orcid.org/0000-0001-5497-2743>
 Richard A. Bryant  <http://orcid.org/0000-0002-9607-819X>

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