

Mental health in selected MENA countries during COVID-19: an empirical investigation

Pakinam Mahmoud Fikry

Faculty of Economics and Political Science, Cairo University, Giza, Egypt

Abstract

Purpose – The outbreak of COVID-19 not only had serious negative impacts on the world economy but also on the global mental health because of the psychological disorders associated with the spread of the pandemic, the increased degree of uncertainty and the unprecedented measures taken by different countries to face the pandemic's spread. This paper analyses the mental health well-being of individuals in selected MENA countries (Jordan, Morocco, Tunisia and Egypt) during the pandemic.

Design/methodology/approach – The study employs a pooled OLS model using the Economic Research Forum (ERF) COVID-19 MENA Monitor Survey panel dataset collected during 2020 and 2021.

Findings – The findings show that there is no association between the mental health of individuals in the selected countries and their age, gender, family size, marital status, receipt of social support and participation in care work. Mental health improved at higher levels of education, being employed, being a rural area resident and living in Morocco or Tunisia compared to living in Jordan while it worsened as income declined, food insecurity and anxiety about being infected with Covid-19 increased, being a resident in camps, and during waves 4 and 5. Based on these results, it is recommended that suitable financial, physical and human resources should be directed towards the provision of mental health care services in the region. Also, mental health care services should be accessible to different population groups, with a special focus towards the most vulnerable since they are more prone to mental illnesses, especially during health crises and economic shocks. This should be accompanied by increasing awareness about the provided services and reducing stigma against mental illnesses. Furthermore, introduction of policies targeted towards reducing food insecurity and income instability can play a key role in enhancing mental well-being.

Originality/value – Although few papers have previously investigated the impact of COVID-19 on mental health in MENA countries, most of them have focused on a country-level analysis and adopted a gender perspective. Hence, this paper aims at exploring the association between mental health well-being and socio-economic factors in selected MENA countries during the pandemic.

Keywords Mental health, COVID-19, MENA countries, WHO-5 well-being index

Paper type Research paper

Introduction

The outbreak of Covid-19 had an unprecedented impact not only on the world economy, mortality, and morbidity but also on the mental well-being of individuals. Its negative repercussions on mental distress were associated with the lockdowns, quarantine, school closures, domestic violence upsurge, the fear of being infected with the pandemic or losing loved ones and movement restrictions imposed by different governments around the world which had led to separation from family and/or friends and restricted the individuals' freedom. This has been exacerbated by its adverse effect on local and global economies through the disruption of economic activity that led to business closures, contraction in



JEL Classification — I10, I18, C33

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production, job loss and a high degree of uncertainty about the future (Dong and Bouey, 2020; Shuwiekh *et al.*, 2022; UN Women, 2021).

Since the beginning of the outbreak, the World Health Organization had emphasized the significant negative impact of that health crisis on human health and well-being and has warned that it shall lead to an upsurge in mental and psychological distress; such as loneliness, anxiety, depression, self-harm and suicidal behavior (Al-Dhaheri *et al.*, 2021; Ben Salah *et al.*, 2022; Kumar and Nayar, 2021). Similar impacts were witnessed during the spread of the severe acute respiratory syndrome (SARS) epidemic in 2003, where anxiety, distress and depression were some of the main psychological disorders that resulted from it, yet its impact was less severe than that of COVID-19. Moreover, the traumatic stress of COVID-19 is a continuous ongoing stress that affected both those who did not suffer from mental health problems and those with a mental health history and hence shall lead to more severe post-traumatic stress disorder symptoms as evidenced by research on SARS and Middle East respiratory syndrome (Boden *et al.*, 2021).

Only few studies have tackled the impact of COVID-19 on mental health in the MENA region, mainly through a gender perspective, although the region is a very sensitive area that faces multiple economic and political challenges. In addition to that, the MENA countries suffered from a higher than the global average burden of mental health before the outbreak of COVID-19 where the Arab Barometer's survey reported that around 35% of the respondents suffered from stress and 29% suffered from depression. Also, the share of mental disorders in the Eastern Mediterranean region reached 5.6% of the total disease burden in 2013. Hence, the region was already suffering from poor mental health before the pandemic and which is expected to have exacerbated after its outbreak (Ibrahim, 2021; Spinardi *et al.*, 2022; Thomas, 2019).

Moreover, the region has been suffering from historical traumas due to political turmoil that resulted from the Iraqi gulf wars, the Arab spring, and Syrian and Libyan civil wars. Hence, COVID-19's traumatic stress is expected to be exacerbated in those countries especially in light of the negative impact of the Russian-Ukrainian war on the region. Accordingly, special attention needs to be directed towards mental health in the region (Shuwiekh *et al.*, 2022; Süß and Weipert-Fenner, 2022).

Hence, the paper aims at investigating the association between mental health and the socio-economic factors in selected MENA countries (Jordan, Morocco, Tunisia and Egypt) during the pandemic. That relationship shall be estimated through employing a pooled OLS model where the Economic Research Forum (ERF) COVID-19 MENA Monitor Household Survey collected over five waves during 2020 and 2021 will be utilized and the WHO-5 mental well-being index will be used to measure mental health during the study period. The paper will be divided into 4 sections. Section I will review the literature and explore the key findings reached by previous studies. Section II will provide a description of the survey data and the methodology employed in the study. This will be followed by Section III which will present a descriptive and an empirical analysis of the association between mental health and the socio-economic factors during the pandemic. And the last section concludes the paper with policy implications and data limitations.

Literature review

Although the impact of COVID-19 on mental health has been studied extensively in the literature in both developed and developing countries, it has been under-researched in the MENA region. Furthermore, most of the studies focused on evaluating the impact of COVID-19 on mental health of the general population in contrast to few studies that focused on the mental health of subgroups in the population, such as women (Farrell *et al.*, 2020; Wu *et al.*, 2020; Ravaldi *et al.*, 2020; Sieverding *et al.*, 2023; Spinardi *et al.*, 2022) and health care workers (Azam *et al.*, 2022; Davico *et al.*, 2021; García-Fernández *et al.*, 2022; Sabbah, 2022; Shreffler *et al.*, 2020).

Throughout those studies, the dependent variable is mental health and is mainly measured through the Impact of Event Scale-Revised; the Depression, Anxiety and Stress Scale; WHO Well-being Index; Personality Inventory for DSM-5-Brief Form-Adult and General Anxiety Disorder-7. The independent variables utilized included a wide range of socio-economic factors; such as marital status, age, educational level, employment, place of residence and household size.

Across different countries, mental health was found to have worsened during the pandemic, however the mental stressors and individuals' characteristics suffering from mental disorders have differed. Although anxiety and depression were found to be key stressors that affected the mental health of individuals in most studies (Cayo-Rojas, 2021; Lee *et al.*, 2021; Mmanga *et al.*, 2023; Verma, 2020; Villatoro *et al.*, 2022; Wang *et al.*, 2020; Zhang and Ma, 2020), other stressors included loneliness (Chandola *et al.*, 2020; Lee *et al.*, 2021) and stress (Ma *et al.*, 2020; Wang *et al.*, 2020).

Age and gender were found to be key factors that were associated with suffering from mental disorders in most studies where females and youth were found to be affected by the pandemic more than men and the elderly (Davico *et al.*, 2021; Mmanga *et al.*, 2023; Qiu *et al.*, 2020; Wang *et al.*, 2020). However, no significant impact was found for age and gender on the mental health of 403 Peruvian dentistry students by Cayo-Rojas *et al.* (2021).

Having a history of mental illness and medical problems, being infected with a chronic disease, and having an infected relative with Covid-19 increased the severity of mental disorders during the pandemic (Mazza *et al.*, 2020). Also, attaining higher levels of education were found to have an adverse effect on mental health (Mmanga *et al.*, 2023). Students were found to be among the most affected population groups due to a wide variety of reasons related to the fear of losing loved ones, lack of activity, worries about finances and future jobs in addition to taking care of families. Furthermore, long school closures and the uncertainties associated with online education exacerbated the negative consequences of the pandemic (Lee *et al.*, 2021; Wang *et al.*, 2020). Results regarding the marital status and employment were inconclusive. Although Ma *et al.* (2020) found a positive impact of marital status on mental health of 728 individuals in mainland China during April 2020, Cayo-Rojas (2021) did not find any significant impact. Similarly, Ma *et al.* (2020) did not find any significant impact of employment on mental health in contrast to Chandola *et al.* (2020) who found a negative impact of unemployment on mental health and Pierce *et al.* (2020) who found a negative impact of employment on mental health.

In accordance with the global literature, the literature in the MENA region has reached similar results. Anxiety, depression and stress were found to be the key stressors in Egypt, Qatar and Iran (El-Zoghby *et al.*, 2020; Farrell *et al.*, 2020; Shahriarirad *et al.*, 2021). Mental distress was found to be most prevalent among females, youth, university students, urban area residents, individuals suffering from chronic diseases, being employed, watching/reading news about the pandemic, lack of emotional support from family and society and after introduction of the quarantine measures (Alkhamees *et al.*, 2020; Arafa *et al.*, 2021; Farrell *et al.*, 2020; Fawaz and Samaha, 2020).

In contrast, no significant impact of age and gender was found on mental health in Saudi Arabia (Alsaqri *et al.*, 2020) and among university students in the United Arab Emirates (Drissi *et al.*, 2020). Also, Shahriarirad *et al.* (2021) found that being more informed about the disease and being older had a protective impact against mental disorders, while being a member of a large family increased the risk of suffering from anxiety among the general population in Iran. Furthermore, he found that higher education had a positive impact on mental health similar to the results reached among a panel of 18 MENA countries by Al-Dhaheri *et al.* (2021) and in Saudi Arabia by Alkhamees *et al.* (2020). However, Abdel-Fattah *et al.* (2020) concluded that medium-educated participants suffered from higher levels of anxiety and depression compared to low and high educated participants in Cairo and Giza during the period (October 2019–April 2020).

Results regarding the marital status were inconclusive. Although [Shahriarirad et al. \(2021\)](#) found a positive impact on mental health in Iran, [Alsaqri et al. \(2020\)](#) found a negative impact. On the other hand, [Al-Dhaheri et al. \(2021\)](#) did not find any significant impact. Also, previous mental health problems or pregnancy complications were found to have no significant impact on the mental health of perinatal women in Qatar during June and July 2020 ([Farrell et al., 2020](#)). Moreover, health care workers were found to suffer more from mental disorders ([Alkhamees et al., 2020](#); [Shariarid et al., 2021](#)) in contrast to the results reached by [Davico et al. \(2021\)](#).

Using a panel of 7 Arab countries, the impact of COVID-19 on mental health was examined by [Shuwiekh et al. \(2022\)](#) through conducting a survey that covered 1374 participants during April and May 2020. Similar to previous studies, the pandemic was found to have a negative impact on mental health in most Arab countries, especially Egypt, which was significantly affected by income, religion and age in contrast to education. From a gender perspective, [Barsoum and Majbouri \(2021\)](#) and [Sieverding et al. \(2023\)](#) analyzed the impact of the pandemic on women's subjective well-being in Jordan, Egypt, Morocco, Tunisia and Sudan. Worse subjective well-being for women was associated with employment, income loss, limitations in food access and time spent on housework while no significant impact was found for transfer payments. In contrast, [Spinardi et al. \(2022\)](#) did not find any significant impact of shifts in the labor market status, income loss and number of coping strategies on the mental well-being of women while food insecurity had a negative impact similar to previous studies.

Furthermore, systematic reviews were conducted by [Serafini et al. \(2020\)](#), [Semo and Frissa \(2020\)](#), [Xiong et al. \(2020\)](#), [Lu and Lin \(2021\)](#) and [OECD \(2021\)](#). Prevalence of mental health problems was found to be associated with unemployment due to the pandemic, income uncertainty, salary reduction and suffering from chronic diseases or disabilities. Also, mental health problems were found to be more prevalent among women, privately employed individuals, the disadvantaged groups and those who are frequently exposed to social media; however, results regarding age and gender were inconclusive.

Also, [Singh et al. \(2020\)](#) reviewed the impact of the pandemic on the mental health of children and adolescents. They concluded that children and adolescents were affected by the pandemic due to school closures associated with disruption in education and lack of socialization opportunities, an increase in child labor for underprivileged families and the incapability of poor families' children of having an adequate access to online learning offered during the pandemic. This has been associated with violence against children due to financial difficulties faced by poor families and separation of children from their families because of being infected with COVID-19. Similar results were reached by [Nearchou et al. \(2020\)](#) and [Panchal et al. \(2021\)](#).

To conclude, although the impact of the pandemic on mental health has been widely investigated globally, the results were inconclusive especially in the MENA region. Most studies have focused on analyzing that relationship on a country-level while only a few examined it across a number of countries in the MENA region and mainly adopted a gender perspective. However, gendered roles were proven to have less impact than expected in selected countries in the region by [Sieverding et al. \(2023\)](#). Hence, this study aims at gaining a more holistic and comprehensive understanding of that relationship across selected MENA middle-income countries.

Materials and methods

This paper utilizes the ERF COVID-19 MENA Monitor Household Survey where a panel dataset was collected by the ERF using a series of short panel mobile phone surveys over five waves between June 2020 and August 2021 ([OAMD, 2021](#)). The survey was conducted in five MENA countries, which are: Jordan, Morocco, Tunisia, Egypt and Sudan, where between two to four surveys were conducted in each country starting with an initial sample of around 2000 individuals. The study will focus on Jordan, Morocco, Tunisia and Egypt since they are lower

middle-income while Sudan will be excluded since it is a low-income country. Table 1 shows the number of participants in each country per wave.

Participants in the survey were mobile phone users aged 18–64 years. The sample was selected based on random digit dialing, with up to three attempts if a phone number was not picked up/answered, was disconnected or busy, or picked up but could not complete the interview at that time. Weights were created to account for the sampling strategy and non-response by observable characteristics relative to the population of 18–64-year-old phone owners in nationally representative pre-COVID-19 in-person surveys.

The survey covered topics such as demographic and household characteristics, education and children, employment characteristics, social distancing, mental health in addition to a number of other indicators and modules related to farmers, workers, women and household enterprises. The survey considered the key demographic and socio-economic characteristics of each country in the questionnaires’ design to understand the different distributional consequences of the COVID-19 impact and responses to it.

The data collection procedure underwent Institutional Research Board (IRB) approval. The survey was harmonized by the ERF to create comparable data that can facilitate cross-country and comparative research. All the COVID-19 MENA Monitor Surveys incorporate similar survey designs, with data on households and individuals within those households.

In order to estimate the association between different socio-economic factors and mental health during the pandemic in the MENA region, a descriptive analysis shall be presented in addition to estimating a pooled OLS model using STATA 14. Pooled OLS is adopted to capture the association between both time variant and time invariant variables with the mental well-being. Also, country and time dummies are added to the model to account for unobserved heterogeneities across countries and variations over time and sampling weights are used in the estimation procedure.

The pooled OLS model takes the following form:

$$Y_{it} = \alpha + x'_{it}\beta + \varepsilon_{it}$$

Where

- Y_{it} : dependent variable
- α : intercept
- x'_{it} : vector of independent variables
- β : vector of parameters to be estimated
- ε_{it} : error term

Table 1.
COVID-19 MENA
Monitor Survey by
country and wave

Wave	Jordan	Morocco	Country Tunisia	Egypt	Total
W1:Jun-2020				1923	1923
W1: Nov-2020		2007	2000		4007
W2:Feb-2021	2549	2002	2077	2000	8628
W3:Apr-2021		2105	2057		4162
W4:Jun-2021	2503	2006	2009	2007	8525
W5:Aug-2021	2573				2573
Total	7625	8120	8143	5930	29,818

Source(s): Prepared by the author

The dependent variable (mental health) is measured through using the World Health Organization's five-question module to measure self-reported mental well-being. The five component questions aimed at evaluating the feelings of an individual during the pandemic on a scale from 0 "at no time" to 5 "all of the time" through inquiring about the following:

- (1) Felt cheerful and in good spirits;
- (2) Felt calm and relaxed;
- (3) Felt active and vigorous;
- (4) Woken up feeling fresh and rested;
- (5) Felt their daily life has been filled with things that interest them.

In order to create a single variable that measures the mental health of the respondents in the study, the WHO-5 mental well-being index is calculated through summing the scores of each individual for each one of the five questions which scores from 0 (worst possible quality of life) to 25 (best possible quality of life). Then the result is multiplied by four to have a 0–100 scale, with 100 representing the best mental well-being. A score below or equal 50 indicates poor mental well-being which may be secondary to a depressive disorder or other etiology and hence further investigation needs to be made especially regarding suffering from depression (Psychiatric Center North Zealand, 2022).

The index has been validated in various contexts as a representative of the individual's mental health (Downs *et al.*, 2017; Krieger *et al.*, 2014; Topp *et al.*, 2015). It has also been validated internally through the utilization of the Cronbach's alpha test which showed a coefficient greater than 0.7 indicating a high degree of internal consistency in addition to fulfilling the Mokken analysis for scalability (De Wit *et al.*, 2007; Omani-Samani *et al.*, 2019; Tavakol and Dennick, 2011). Furthermore, the items included in the index resemble some of the subscales used by SF-36 and ICD-10 in measuring mental health disorders (Bech *et al.*, 2003).

Table 2 provides a description of the independent variables. The choice of the independent variables was based on previous studies conducted both globally and on a regional level and that were discussed in the previous section. Mixed results have been reached regarding the association between the chosen independent variables and mental health across different countries and hence they were chosen to analyze the association between them in the context of the MENA region. Age, gender, marital status, place of residence, educational level and employment have been used as independent variables in most of the studies.

Variables related to household size, anxiety about being infected with Covid-19, income, food insecurity, social assistance, and care work during the study period shall also be utilized. Results were mixed regarding household size, where Shahriarirad *et al.* (2021) found a negative impact of larger household size on mental health in contrast to Sempungu *et al.* (2023) who found a positive relationship.

Although anxiety about being infected with Covid-19 could have a negative impact on mental well-being due to the exposure to news about the pandemic through different platforms of social media and its devastating impact on health (Arafa *et al.*, 2021), it could also enhance mental well-being through an increase in awareness about it and the ways through which infection could be reduced or avoided (Shahriarirad *et al.*, 2021).

Food insecurity has been a major cause of mental disorders and has exacerbated since the onset of the pandemic (Amare *et al.*, 2021; Jones, 2017; Sieverding *et al.*, 2023; Spinardi *et al.*, 2022). Care work has been increased during the pandemic due to lockdowns and school closures and which mainly affected the mental health of females due to carrying out most of that type of work (Craig and Churchill, 2021; Hendy and Yassin, 2022; Möhring *et al.*, 2021). However, results were inconclusive where Seck *et al.* (2021) found a negative impact while Barsoum and Majbouri (2021) did not find any significant impact.

Table 2.
Independent variables’
description

Independent variable	Description
Gender	Dummy variable that takes the value of 1 if the participant is a female and 0 if the participant is a male
Age	Age of the participant in years
Household size	A continuous variable that shows the number of individuals in a household
Place of residence	Categorical variable that takes the value of 1 if the place of residence is urban, 2 if the place of residence is rural and 3 if the place of residence is in a camp (Jordan only)
Educational level	Categorical variable that takes the following values (less than basic education, basic education, secondary education, higher education)
Marital status	Categorical variable that takes the following values (never married, currently married, widowed/divorced)
Employment	Dummy variable that takes the value of 1 if the participant is employed and 0 if the participant is non-employed
Income	Categorical variable that measures the change in household’s total monthly income compared to February 2020 and takes the following values (decreased by more than 25%, decreased by 1–25%, stayed the same, increased by 1–25%, increased by more than 25%)
Anxiety	Categorical variable that measures anxiety about being infected with COVID-19 and takes the following values (not at all worried, a little worried, rather worried, very worried, I had it already)
Food security	Count variable that measures the level of food insecurity faced by anyone in the household during a week before due to five key limitations in access to food, which are: mobility restrictions, food shortages in markets, price increases, decline in income and reduced meals/portions. The variable ranges from (0–5)
Social support	Dummy variable that takes the value of 1 if the individual received irregular social assistance during the past month in the form of food, cash or other and 0 in case he did not receive it
Care work	Dummy variable that takes the value of 1 if women participated in housework (cooking, cleaning, house repairs, shopping or transporting family, tending children aged 0–5 years, caring for children aged 6–17 years, caring for adult ill/dependents) during the past seven days and 0 if they did not participate in any housework
Country	Categorical variable that takes the following values (Jordan, Morocco, Tunisia, Egypt)
Wave	Categorical variable that takes the following values (wave 1, wave 2, wave 3, wave 4, wave 5)
Source(s): Prepared by the author	

During the pandemic, labor markets have witnessed significant changes that led to an increase in the number of the unemployed where [Khamis *et al.* \(2021\)](#) found that around 34% of workers, on average, lost their jobs in 39 countries and the situation was not different in the MENA region where the unemployment levels increased compared to the pre-COVID levels ([Elbehairy *et al.*, 2022](#)). Hence, income was found to be a key indicator that affected mental health due to its impact on access to food and other goods and services ([Alkhamees *et al.*, 2020](#); [Sieverding *et al.*, 2023](#); [Shuwiekh *et al.*, 2022](#)). Although social assistance was provided to individuals during the pandemic, through an increase in regular assistance programs or through irregular assistance programs, as a way of providing financial protection against its negative repercussions, results reached by previous studies were mixed where a significant impact was found by [Tham *et al.* \(2021\)](#) and [Ward and Lee \(2022\)](#) in contrast to [Sieverding *et al.* \(2023\)](#).

Empirical results

Around 71% of the respondents were found to suffer from mental health problems with a mental health score of less than or equal 50. Based on Table 3, the prevalence of poor mental health problems was higher among females in Morocco and Egypt while it was slightly higher among males in Tunisia and Jordan. Regarding education, poor mental health was more prevalent among individuals with secondary education (71.9%) followed by those with less than basic education (70.4%), basic education (69.1%), and higher education (67.9%). Poor mental health was also more prevalent among those who resided in camps (84.8%) while it was less prevalent in rural areas (71.6%) and urban areas (71.4%).

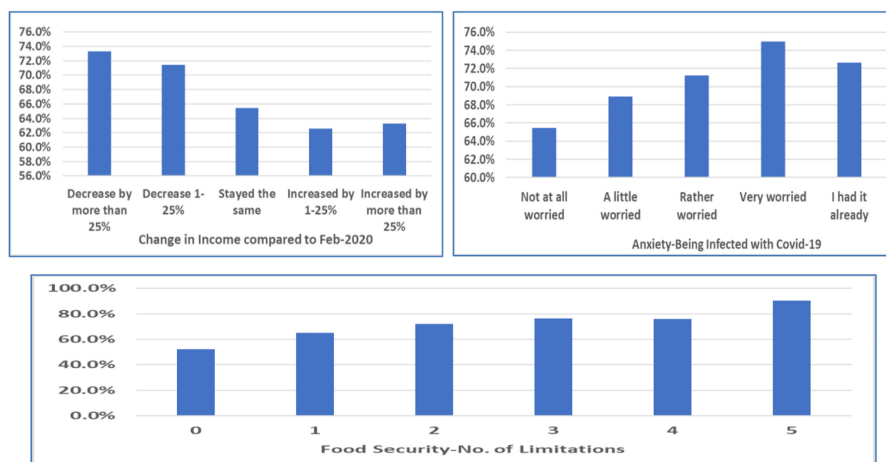
Prevalence of poor mental health reached 73.3% among the non-employed compared to the employed (66.6%) and among the married (72.2%) compared to the widowed or divorced (71.3%) and the never married (65.2%). Also, it was more prevalent among individuals who witnessed a decline in their income (73%), who were very worried about being infected with COVID-19 (75%) and who faced a larger number of limitations in access to food where it reached 91% among those who faced five limitations (Figure 1). Although the studied sample across Jordan, Morocco, Tunisia and Egypt suffered from poor mental health through different waves of the pandemic, there was a significant increase during wave 4 as shown in Figure 2.

Results of the pooled OLS model are displayed in Table 4. Similar to previous studies, gender, age and household size did not have a significant impact on mental well-being (Alsaqri *et al.*, 2020; Cayo-Rojas, 2021; Davico *et al.*, 2021; Drissi *et al.*, 2020; Ma *et al.*, 2020; Shahriarirad *et al.*, 2021), while a positive significant relationship was found between residing in rural areas compared to living in urban areas in contrast to living in camps which had a negative impact on mental health with 8.6% points (Ma *et al.*, 2022; Menculini *et al.*, 2021;

Country	Male	Female
Jordan	70.5%	69.9%
Morocco	59.3%	68.6%
Tunisia	72.1%	71%
Egypt	78.1%	82.8%

Source(s): Prepared by the author

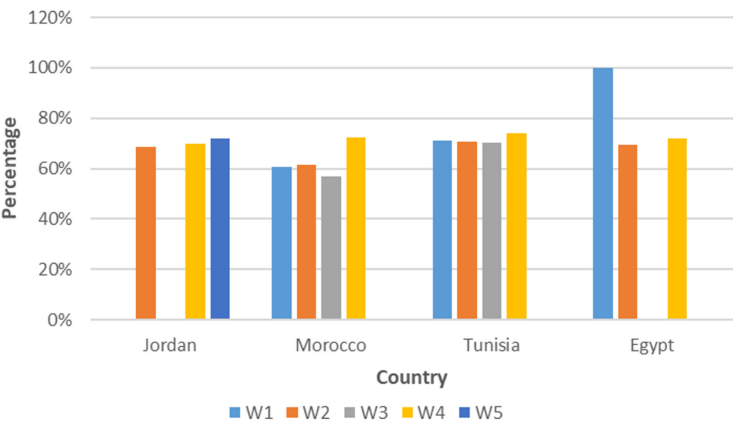
Table 3.
Prevalence of mental
health problems by
country and gender



Source(s): Prepared by the author

Figure 1.
Poor mental health
prevalence by income,
anxiety and food
insecurity

Figure 2.
Poor mental health
prevalence across
different countries
by wave



Source(s): Prepared by the author

[Sagar et al., 2022](#)). This might be explained by the over crowdedness, high levels of pollution, reduced access to green areas, increased economic stressors and reduced social support in urban areas ([Srivastava, 2009](#)). In camps, refugees are more prone to suffer from poor mental health due to past trauma and ongoing stress accompanied with social isolation, language and employment barriers and financial hardships in addition to poor access to health care services including mental health services ([Nowak et al., 2023](#); [Van de Wiel et al., 2021](#)).

Regarding the level of education, an improvement was witnessed in mental health as the educational level increased, since having a secondary or higher education increased the mental score by 1.8 and 1.4% points respectively compared to those who had a less than basic level of education in accordance with previous studies ([Boden et al., 2021](#); [Qiu et al., 2020](#)). This might be due to the positive impact of attaining higher levels of education on physical health and improved health behavior and knowledge in addition to the increased level of awareness about the pandemic among individuals with higher levels of education and their better ability to adopt suitable coping strategies due to their greater economic and social resources ([Di Crosta et al., 2020](#); [Kondirolli and Sunder, 2022](#)).

Marital status did not have a significant impact on mental health in line with previous studies ([Al-Dhaheri et al., 2021](#); [Cayo-Rojas, 2021](#)). Being employed enhanced the mental health score by around 1.6% points compared to those who are non-employed similar to [Barsoum and Majbouri \(2021\)](#) and [Xiong et al. \(2020\)](#). This might be explained by the reduced anxiety about suffering from financial distress due to having a secure source of income ([Lu and Lin, 2021](#)).

Mental well-being was not affected by the irregular social assistance provided during the pandemic, which illustrates that the assistance might have been insufficient in coverage or scope in addition to the short-term nature of the assistance schemes that might have affected the capability of detecting any effects of the irregular assistance on mental health ([Asaad et al., 2022](#); [Sieverding et al., 2023](#)). Also, social care work carried out by women did not have a significant impact on their mental health. The extra work carried out by women might have been outweighed with the positive impact of care work represented in family appreciation and cohesion in addition to gaining a sense of self-worth and accomplishment ([Boye, 2010](#); [Krantz et al., 2005](#); [Noor, 1997](#)).

The decline in income compared to February 2020 had a negative impact on mental well-being which might be explained by the financial insecurity associated with uncertainty about

Variable	Coefficient	S.E.	Mental health in selected MENA countries
<i>Gender (reference category: male)</i>			271
Female	−3.935	3.347	
Age	−0.0295	0.027	
HH size	−0.117	0.116	
<i>Place of residence (reference category: urban)</i>			
Rural	1.560**	0.617	
Camp	−8.585**	4.240	
<i>Educational level (reference category: less than basic education)</i>			
Basic	1.217	0.802	
Secondary	1.840***	0.652	
Higher Education	1.360*	0.717	
<i>Marital status (reference category: never married)</i>			
Currently married	0.243	0.742	
Widowed/divorced	−0.840	1.412	
<i>Employment (reference category: non-employed)</i>			
Employed	1.628***	0.604	
<i>Income (reference category: stayed the same)</i>			
Decreased by more than 25%	−3.334***	0.677	
Decreased by 1–25%	−1.162*	0.674	
Increased by 1–25%	1.066	1.201	
Increased by more than 25%	1.453	1.644	
<i>Anxiety (reference category: not worried about being infected with COVID-19)</i>			
A little worried	−1.892***	0.680	
Rather worried	−1.905***	0.718	
Very worried	−3.998***	0.770	
Had been infected	−6.285***	1.110	
<i>Food security (reference category: no limitations/no change)</i>			
1 limitation	−7.757***	0.875	
2 limitations	−10.955***	0.816	
3 limitations	−12.727***	0.862	
4 limitations	−13.559***	0.940	
5 limitations	−17.579***	1.007	
<i>Social support (reference category: did not receive irregular social support)</i>			
Received support	0.0101	1.093	
<i>Care work (reference category: no care work)</i>			
Carrying out care work	4.884	3.332	
<i>Country (reference category: Jordan)</i>			
Morocco	3.183***	0.909	
Tunisia	2.160**	0.846	
Egypt	0.507	0.710	
<i>Wave (reference category: wave 1–2020)</i>			
Wave 2 (Feb-21)	−0.940	0.953	
Wave 3 (Apr-21)	0.473	1.083	
Wave 4 (Jun-21)	−2.904***	0.937	
Wave 5 (Aug-21)	−3.892***	1.214	
Constant	50.745***	1.783	
Note(s): *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$			Table 4. Pooled OLS model estimation
Source(s): Prepared by the author			

the pandemic's future economic consequences in addition to its impact on food insecurity, limited access to health-promoting goods and services and loss of control over the individuals' lives (Lu and Lin, 2021; Spinardi *et al.*, 2022; Yang *et al.*, 2022). Also, limitations in access to food negatively affected the mental well-being which worsened as the number of limitations experienced increased in accordance with the results reached by Shepherd (2022) regarding increased depression in South Africa due to anxiety about food access and shame of the methods adopted in access to food such as relying on others. Anxiety about being infected with COVID-19 worsened mental health especially if the individual had been infected by the pandemic which is consistent with the results reached by Xie *et al.* (2022).

Furthermore, mental health well-being declined during waves 4 (June 2021) and 5 (August 2021) compared to wave 1. This might be due to the increase in the number of infected individuals in addition to the decline in the economic performance of the studied countries during those waves compared to the pre-pandemic period.

Living in Tunisia and Morocco enhanced the mental well-being by around 2.2 and 3.2% points compared to living in Jordan, respectively. Extensive infrastructure for the delivery of public health services, including mental health, has been developed by Morocco, Tunisia and Jordan, yet resource constraints still prevail especially in the latter. Tunisia and Morocco had a score of 3 out of 5 on a summary scale of mental health integration in primary health care services while Jordan scored 2. The mental health facilities have reached 0.11 and 0.10 with 9.35 and 5.86 beds and 88.11 and 59.82 admissions per 100,000 population in Tunisia and Morocco respectively compared to 0.04 facilities, 3.70 beds and 28.62 admissions per 100,000 population in Jordan in 2019. Also, the mental health workforce per 100,000 population has reached around 8 in Tunisia and 6 in Morocco compared to 4 in Jordan. Morocco was also successful in reaching the six targets of the comprehensive mental health action plan [1] set out by the World Health Assembly in contrast to 4 and 2 targets achieved by Jordan and Tunisia, respectively (Economist Impact, 2023; World Health Organization, 2022).

In addition to that, the number of refugees and asylum seekers in Jordan has reached around 757,805 from Syria (88.5%), Iraq (8.8%), Yemen (1.7%) and other countries (1%) in 2021. Moreover, Jordan hosts more than 2 million Palestinians due to the Palestinian-Israeli conflict. Those traumatized individuals were found to suffer from mental health problems due to financial and structural barriers in access to mental health care services and widespread stigma in the community against mental illnesses. This has been exacerbated during COVID-19 due to isolation, social distancing, and loss of income (World Health Organization, 2023).

Furthermore, Morocco witnessed a growth rate of around 8% compared to 4.3% in Tunisia, 3.3% in Egypt and 2.2% in Jordan in 2021 (World Bank, 2023). Also, the unemployment rate declined in Morocco from 30% in November 2020 to 22% in April 2021 before rising to 28% in June 2021 due to seasonal changes in the agricultural sector. Similar reductions were witnessed in Tunisia where unemployment reduced from 38% in November 2020 to 28% in June 2021 (Krafft *et al.*, 2022; Marouani *et al.*, 2022). This might be explained by the adoption of both countries for a mix of support policies to firms and workers through emergency plans, extension of loan guarantees to firms, provision of interest rate subsidies, deferral of tax payments and social insurance contributions which might have had a positive impact on reducing mental disorders during the pandemic. Moreover, the Moroccan government adopted an action plan that included the provision of economic and social support to the population and was successful in targeting the poorest quartiles (Krafft *et al.*, 2021).

Discussion and conclusion

Being ranked as the ninth cause of the global burden of disease in 2017, global mental health disorders are a growing concern, and the MENA region is not an exception since it suffered from a higher than the global average burden of mental health prior to the outbreak of

COVID-19 (Ibrahim, 2021). Thus, the study explored the association between different socio-economic factors and mental health in selected MENA countries during the pandemic. Mental health was found to have worsened among individuals who are less educated, non-employed, whose income decreased, who faced a larger number of limitations to food access, who lived in camps, who had been infected with COVID-19, during waves 4 and 5 and who lived in Jordan compared to Morocco and Tunisia. However, no significant impact was found for gender, age, household size, marital status, care work and social support.

Based on the study's results, a number of policies are recommended. Suitable financial, physical, and human resources should be directed towards the provision of mental health care services in the region since only 2% of the government's health budget is currently allocated to mental health. Mental health services should be accessible to different population groups, with a special focus towards the most vulnerable, such as the less educated individuals, the non-employed and those who reside in camps since they are more prone to mental illnesses, especially during health crises and economic shocks. This should be accompanied by increasing awareness about the provided services and reducing stigma against mental illnesses (Ibrahim, 2021; Economist Impact, 2023; Witteveen *et al.*, 2022; World Health Organization, 2010). Also, policies related to food security should be adopted through the provision of in-kind food and vouchers for food purchase as well as increasing investment in social safety net programs. Support programs for businesses and individuals during disruptions and crises shall reduce the risk of job loss and decline in income and hence lessen the level of uncertainty and anxiety (Hoogeveen and Lopez-Acevedo, 2021; Spinardi *et al.*, 2022).

Similar to previous studies that investigated mental health during the pandemic, a key limitation of the study is utilizing self-reported questionnaires which might lead to respondent's bias or misreporting of data. Also, the survey data was collected based on representatives of mobile phone users aged (18–64) years and hence individuals aged less than 18 and greater than 64 might have had different experiences during the pandemic.

The study has analyzed the association between different socio-economic factors and mental health in selected MENA countries during COVID-19, where it adds to the previous literature in providing a comprehensive analysis regardless of the gendered roles. This shall assist the selected countries in drawing up policies related to enhancing mental health in general and in case of disruptions that affect the population's health. However, further research is needed to investigate the causality between different factors and mental health to gain a better understanding of the determinants of poor mental health in the region and in the studied countries.

Note

1. <https://www.emro.who.int/mnh/mental-health-action-plan/index.html>

References

- Abdel-Fattah, H.M., Hussein, K.A. and Bahary, H. (2020), "Covid-19 impact on mental health of Egyptians patients", *Journal of Psychiatry and Psychiatric Disorders*, Vol. 4, pp. 87-93.
- Al-Dhaheri, A.S., Bataineh, M.F., Mohamad, M.N., Ajab, A., Al Marzouqi, A., Jarrar, A.H., Habib-Mourad, C., Abu Jamous, D.O., Ali, H.I., Al Sabbah, H., Hasan, H., Stojanovska, L., Hashim, M., Abd Elhameed, O.A., Shaker Obaid, R.R., ElFeky, S., Saleh, S.T., Osaili, T.M. and Cheikh Ismail, L. (2021), "Impact of COVID-19 on mental health and quality of life: is there any effect? A cross-sectional study of the MENA region", *PloS One*, Vol. 16 No. 3, e0249107, pp. 1-17, doi: [10.1371/journal.pone.0249107](https://doi.org/10.1371/journal.pone.0249107).
- Alkhamees, A.A., Alrashed, S.A., Alzunaydi, A.A., Almohimeed, A.S. and Aljohani, M.S. (2020), "The psychological impact of COVID-19 pandemic on the general population of Saudi Arabia", *Comprehensive Psychiatry*, Vol. 102, 152192, pp. 1-10, doi: [10.1016/j.comppsy.2020.152192](https://doi.org/10.1016/j.comppsy.2020.152192).

- Alsaqri, S.H., Alkwiese, M.J., Aldalaykeh, M.K., Hamzi, M.I., Mahdi, M.M. and Shafie, Z.M. (2020), "Anxiety among the general population during Coronavirus-19 disease in Saudi Arabia: implications for a mental support program", *medRxiv*, pp. 1-9, doi: [10.1101/2020.05.07.20090225](https://doi.org/10.1101/2020.05.07.20090225).
- Amare, M., Abay, K.A., Tiberti, L. and Chamberlin, J. (2021), "COVID-19 and food security: panel data evidence from Nigeria", *Food Policy*, Vol. 101, 102099, pp. 1-13, doi: [10.1016/j.foodpol.2021.102099](https://doi.org/10.1016/j.foodpol.2021.102099).
- Arafa, A., Mohamed, A., Saleh, L. and Senosy, S. (2021), "Psychological impacts of the COVID-19 pandemic on the public in Egypt", *Community Mental Health Journal*, Vol. 57 No. 1, pp. 64-69, doi: [10.1007/s10597-020-00701-9](https://doi.org/10.1007/s10597-020-00701-9).
- Assaad, R., Krafft, C., Marouani, M.A., Kennedy, S., Cheung, R. and Wahby, S. (2022), *Egypt COVID-19 Country Case Study*, International Labor Organization and Economic Research Forum, Cairo.
- Azam, F., Latif, M.F., Bashir, S., Tirmazi, S.H., Bukhari, N., Al-Selwi, W., AlShamsi, H.O., Ibnshamsah, F. and Zekri, J. (2022), "Impact of COVID-19 pandemic on psychological wellbeing of Oncology clinicians in the Middle East and North Africa (MENA) region", *European Review for Medical and Pharmacological Sciences*, Vol. 26 No. 3, pp. 1049-1055, doi: [10.26355/eurrev_202202_28015](https://doi.org/10.26355/eurrev_202202_28015).
- Barsoum, G. and Majbouri, M. (2021), *A Time of Great Intensity: The Pandemic Effect on Work, Care Work, and Subjective Wellbeing in MENA Countries*, (working paper series no. 1528), Economic Research Forum.
- Bech, P., Olsen, L.R., Kjoller, M. and Rasmussen, N.K. (2003), "Measuring well-being rather than the absence of distress symptoms: a comparison of the SF-36 Mental Health subscale and the WHO-Five Well-Being Scale", *International Journal of Methods in Psychiatric Research*, Vol. 12 No. 2, pp. 85-91, doi: [10.1002/mp.145](https://doi.org/10.1002/mp.145).
- Ben Salah, A., DeAngelis, B.N. and Al'Absi, M. (2022), "Uncertainty and psychological distress during COVID-19: what about protective factors?", *Current Psychology*, Vol. 42 No. 25, pp. 1-8, doi: [10.1007/s12144-022-03244-2](https://doi.org/10.1007/s12144-022-03244-2).
- Boden, M., Zimmerman, L., Azevedo, K.J., Ruzek, J.I., Gala, S., Abdel Magid, H.S., Cohen, N., Walser, R., Mahtani, N.D., Hoggatt, K.J. and McLean, C.P. (2021), "Addressing the mental health impact of COVID-19 through population health", *Clinical Psychology Review*, Vol. 85, 102006, pp. 1-14, doi: [10.1016/j.cpr.2021.102006](https://doi.org/10.1016/j.cpr.2021.102006).
- Boye, K. (2010), "Time spent working: paid work, housework and the gender difference in psychological distress", *European Societies*, Vol. 12 No. 3, pp. 419-442, doi: [10.1080/14616691003716928](https://doi.org/10.1080/14616691003716928).
- Cayo-Rojas, C.F., Castro-Mena, M.J., Agramonte-Rosell, R.C., Aliaga-Mariñas, A.S., Ladera-Castañeda, M.I., Cervantes-Ganoza, L.A. and Cervantes-Liñán, L.C. (2021), "Impact of COVID-19 mandatory social isolation on the development of anxiety in Peruvian dentistry students: a logistic regression analysis", *Journal of International Society of Preventive and Community Dentistry*, Vol. 11 No. 2, pp. 222-229, doi: [10.4103/jispcd.JISPCD_52_21](https://doi.org/10.4103/jispcd.JISPCD_52_21).
- Chandola, T., Kumari, M., Booker, C.L. and Benzeval, M. (2020), "The mental health impact of COVID-19 and lockdown-related stressors among adults in the UK", *Psychological Medicine*, Vols 1-10 No. 14, pp. 2997-3006, doi: [10.1017/S0033291720005048](https://doi.org/10.1017/S0033291720005048).
- Craig, L. and Churchill, B. (2021), "Dual-earner parent couples' work and care during COVID-19", *Gender, Work and Organization*, Vol. 28 No. 1, pp. 66-79, doi: [10.1111/gwao.12497](https://doi.org/10.1111/gwao.12497).
- Davico, C., Ghiggia, A., Marcotulli, D., Ricci, F., Amianto, F. and Vitiello, B. (2021), "Psychological impact of the COVID-19 pandemic on adults and their children in Italy", *Frontiers in Psychiatry*, Vol. 12, 572997, pp. 1-8, doi: [10.3389/fpsyt.2021.572997](https://doi.org/10.3389/fpsyt.2021.572997).
- De Wit, M., Pouwer, F., Gemke, R.J., Delemarre-van de Waal, H.A. and Snoek, F.J. (2007), "Validation of the WHO-5 Well-Being Index in adolescents with type 1 diabetes", *Diabetes Care*, Vol. 30 No. 8, pp. 2003-2006, doi: [10.2337/dc07-0447](https://doi.org/10.2337/dc07-0447).
- Di Crosta, A., Palumbo, R., Marchetti, D., Ceccato, I., La Malva, P., Maiella, R., Cipi, M., Roma, P., Mammarella, N., Verrocchio, M.C. and Domenico, A.D. (2020), "Individual differences, economic

- stability, and fear of contagion as risk factors for PTSD symptoms in the COVID-19 emergency", *Frontiers in Psychology*, Vol. 11, 56736, pp. 1-9, doi: [10.3389/fpsyg.2020.567367](https://doi.org/10.3389/fpsyg.2020.567367), PMID:33013604.
- Dong, L. and Bouey, J. (2020), "Public mental health crisis during COVID-19 pandemic, China", *Emerging Infectious Diseases*, Vol. 26 No. 7, pp. 1616-1618, doi: [10.3201/eid2607.200407](https://doi.org/10.3201/eid2607.200407).
- Downs, A., Boucher, L.A., Camp-bell, D.G. and Polyakov, A. (2017), "Using the WHO-5 well-being index to identify college students at risk for mental health problems", *Journal of College Student Development*, Vol. 58 No. 1, pp. 113-117, doi: [10.1353/csd.2017.0008](https://doi.org/10.1353/csd.2017.0008).
- Drissi, N., Alhmoudi, A., Al Nuaimi, H., Alkhyeli, M., Alsalami, S. and Ouhbi, S. (2020), "Investigating the impact of COVID-19 lockdown on the psychological health of university students and their attitudes toward mobile mental health solutions: two-part questionnaire study", *JMIR Formative Research*, Vol. 4 No. 10, e19876, pp. 1-14, doi: [10.2196/19876](https://doi.org/10.2196/19876).
- Economist Impact (2023), *Mental Health in the Middle East: Measuring Progress Towards Integrated, Accessible and Equitable Mental Health*, The Economist.
- El-Zoghby, S.M., Soltan, E.M. and Salama, H.M. (2020), "Impact of the COVID-19 pandemic on mental health and social support among adult Egyptians", *Journal of Community Health*, Vol. 45 No. 4, pp. 689-695, doi: [10.1007/s10900-020-00853-5](https://doi.org/10.1007/s10900-020-00853-5).
- ElBehairy, H., Hendy, R. and Yassin, S. (2022), *The Impact of COVID-19 on MENA Labor Markets: a Gendered Analysis from Egypt, Tunisia, Morocco, and Jordan*, (working paper series no. 1559), Economic Research Forum.
- Farrell, T., Reagu, S., Mohan, S., Elmidany, R., Qaddoura, F., Ahmed, E.E., Corbett, G., Lindow, S., Abuyaqoub, S.M. and Alabdulla, M.A. (2020), "The impact of the COVID-19 pandemic on the perinatal mental health of women", *Journal of Perinatal Medicine*, Vol. 48 No. 9, pp. 971-976, doi: [10.1515/jpm-2020-0415](https://doi.org/10.1515/jpm-2020-0415).
- Fawaz, M. and Samaha, A. (2020), "COVID-19 quarantine: post-traumatic stress symptomatology among Lebanese citizens", *The International Journal of Social Psychiatry*, Vol. 66 No. 7, pp. 666-674, doi: [10.1177/0020764020932207](https://doi.org/10.1177/0020764020932207).
- García-Fernández, L., Romero-Ferreiro, V., López-Roldán, P.D., Padilla, S., Calero-Sierra, I., Monzó-García, M., Pérez-Martín, J. and Rodríguez-Jimenez, R. (2022), "Mental health impact of COVID-19 pandemic on Spanish healthcare workers", *Psychological Medicine*, Vol. 52 No. 1, pp. 195-197, doi: [10.1017/S0033291720002019](https://doi.org/10.1017/S0033291720002019).
- Hendy, R. and Yassin, S. (2022), *COVID-19 ... Who Will Wash the Dishes and Change the Diapers? Evidence from a Post COVID-19 Time Use Survey on Egypt*, working paper series no.1565, Economic Research Forum.
- Hoogeveen, J.G. and Lopez-Acevedo, G. (2021), *Distributional Impacts of COVID-19 in the Middle East and North Africa Region*, World Bank, Washington, DC, doi: [10.1596/978-1-4648-1776-2](https://doi.org/10.1596/978-1-4648-1776-2).
- Ibrahim, N.K. (2021), "Epidemiology of mental health problems in the Middle East", in Laher, I. (Ed.), *Handbook of Healthcare in the Arab World*, Springer, Cham, pp. 133-149, doi: [10.1007/978-3-030-36811-1_12](https://doi.org/10.1007/978-3-030-36811-1_12).
- Jones, A.D. (2017), "Food insecurity and mental health status: a global analysis of 149 countries", *American Journal of Preventive Medicine*, Vol. 53 No. 2, pp. 264-273, doi: [10.1016/j.amepre.2017.04.008](https://doi.org/10.1016/j.amepre.2017.04.008).
- Khamis, M., Prinz, D., Newhouse, D., Palacios-Lope, A., Pape, U. and Weber, M. (2021), *The Early Labor Market Impacts of COVID-19 in Developing Countries: Evidence from High-frequency Phone Surveys*, (Jobs working paper no. 58), World Bank, Washington, DC.
- Kondiroli, F. and Sunder, N. (2022), "Mental health effects of education", *Health Economics*, Vol. 31 No. S2, pp. 22-39, doi: [10.1002/hec.4565](https://doi.org/10.1002/hec.4565).
- Krafft, C., Assaad, R. and Marouani, M. (2021), *The impact of COVID-19 on Middle Eastern and North African Labor Markets: Glimmers of Progress but Persistent Problems for Vulnerable Workers*, (ERF Policy Brief No.57), Economic Research Forum.

- Krafft, C., Marouani, M.A., Cheung, R., LaPlante, A., Omar, I. and Wahby, S. (2022), *Morocco COVID-19 Country Case Study*, International Labor Organization and Economic Research Forum, Cairo.
- Krantz, G., Berntsson, L. and Lundberg, U. (2005), "Total workload, work stress and perceived symptoms in Swedish male and female white-collar employees", *European Journal of Public Health*, Vol. 15 No. 2, pp. 209-214, doi: [10.1093/eurpub/cki079](https://doi.org/10.1093/eurpub/cki079).
- Krieger, T., Zimmermann, J., Huffziger, S., Ubl, B., Diener, C., Kuehner, C. and Grosse Holtforth, M. (2014), "Measuring depression with a well-being index: further evidence for the validity of the WHO Well-Being Index (WHO-5) as a measure of the severity of depression", *Journal of Affective Disorders*, Vol. 156, pp. 240-244, doi: [10.1016/j.jad.2013.12.015](https://doi.org/10.1016/j.jad.2013.12.015).
- Kumar, A. and Nayar, K.R. (2021), "COVID 19 and its mental health consequences", *Journal of Mental Health*, Vol. 30 No. 1, pp. 1-2, doi: [10.1080/09638237.2020.1757052](https://doi.org/10.1080/09638237.2020.1757052).
- Lee, J., Solomon, M., Stead, T., Kwon, B. and Ganti, L. (2021), "Impact of COVID-19 on the mental health of US college students", *BMC Psychology*, Vol. 9 No. 1, 95, pp. 1-10, doi: [10.1186/s40359-021-00598-3](https://doi.org/10.1186/s40359-021-00598-3).
- Lu, X. and Lin, Z. (2021), "COVID-19, Economic impact, mental health, and coping behaviors: a conceptual framework and future research directions", *Frontiers in Psychology*, Vol. 12, 759974, pp. 1-9, doi: [10.3389/fpsyg.2021.759974](https://doi.org/10.3389/fpsyg.2021.759974).
- Ma, Z.F., Zhang, Y., Luo, X., Li, X., Li, Y., Liu, S. and Zhang, Y. (2020), "Increased stressful impact among general population in mainland China amid the COVID-19 pandemic: a nationwide cross-sectional study conducted after Wuhan city's travel ban was lifted", *The International Journal of Social Psychiatry*, Vol. 66 No. 8, pp. 770-779, doi: [10.1177/0020764020935489](https://doi.org/10.1177/0020764020935489).
- Ma, L., Huang, Y. and Liu, T. (2022), "Unequal impact of the COVID-19 pandemic on mental health: role of the neighborhood environment", *Sustainable Cities and Society*, Vol. 87, 104162, pp. 1-11, doi: [10.1016/j.scs.2022.104162](https://doi.org/10.1016/j.scs.2022.104162).
- Marouani, M.A., Krafft, C., Assaad, R., Kennedy, S., Cheung, R., Latifi, A.D. and Wojcieszynski, E. (2022), *Tunisia COVID-19 Country Case Study*, International Labor Organization and Economic Research Forum, Cairo.
- Mazza, C., Ricci, E., Biondi, S., Colasanti, M., Ferracuti, S., Napoli, C. and Roma, P. (2020), "A nationwide survey of psychological distress among Italian people during the COVID-19 pandemic: immediate psychological responses and associated factors", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 9, 3165, pp. 1-14, doi: [10.3390/ijerph17093165](https://doi.org/10.3390/ijerph17093165).
- Menculini, G., Bernardini, F., Attademo, L., Balducci, P.M., Sciarra, T., Moretti, P. and Tortorella, A. (2021), "The influence of the urban environment on mental health during the COVID-19 pandemic: focus on air pollution and migration-A narrative review", *International Journal of Environmental Research and Public Health*, Vol. 18 No. 8, 3920, pp. 1-13, doi: [10.3390/ijerph18083920](https://doi.org/10.3390/ijerph18083920).
- Mmanga, C., Ndasauka, Y., Kainja, J., Kondowe, F., Mchenga, M., Maliwichi, L. and Nyamali, S. (2023), "The world is coming to an end! COVID-19, depression, and anxiety among adolescents in Malawi", *Frontiers in Psychiatry*, Vol. 1, 1024793, pp. 1-11, doi: [10.3389/fpsyg.2022.1024793](https://doi.org/10.3389/fpsyg.2022.1024793).
- Möhring, K., Naumann, E., Reifenscheid, M., Wenz, A., Rettig, T., Krieger, U., Friedel, S., Finkel, M., Cornesse, C. and Blom, A. (2021), "The COVID-19 pandemic and subjective wellbeing: longitudinal evidence on satisfaction with work and family", *European Societies*, Vol. 23 suppl, pp. S601-S617, doi: [10.1080/14616696.2020.1833066](https://doi.org/10.1080/14616696.2020.1833066).
- Nearchou, F., Flinn, C., Niland, R., Subramaniam, S.S. and Hennessy, E. (2020), "Exploring the impact of COVID-19 on mental health outcomes in children and adolescents: a systematic review", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 22, 8479, pp. 1-19, doi: [10.3390/ijerph17228479](https://doi.org/10.3390/ijerph17228479).
- Noor, N. (1997), "The relationship between wives' estimates of time spent doing housework, support and wives' well-being", *Journal of Community and Applied Social Psychology*, Vol. 7 No. 5, pp. 413-423, doi: [10.1002/\(sici\)1099-1298\(199712\)7:53.0.co;2-j](https://doi.org/10.1002/(sici)1099-1298(199712)7:53.0.co;2-j).

- Nowak, A.C., Nutsch, N., Brake, T., Gehrlein, L. and Razum, O. (2023), "Associations between postmigration living situation and symptoms of common mental disorders in adult refugees in Europe: updating systematic review from 2015 onwards", *BMC Public Health*, Vol. 23 No. 1, p. 1289, doi: [10.1186/s12889-023-15931-1](https://doi.org/10.1186/s12889-023-15931-1).
- OAMDI (2021), "COVID-19 MENA monitor household survey (CCMMHH), Version 5.0 of the licensed data files", CCMMHH_Nov-2020-Aug-2021, available at: <http://www.erfdataportal.com/index.php/catalog> (accessed 30 March 2022).
- OECD (2021), *Tackling the Mental Health Impact of the COVID-19 Crisis: an Integrated, Whole-Of-Society Response*, Author, Paris.
- Omani-Samani, R., Maroufizadeh, S., Almasi-Hashiani, A., Sepidarkish, M. and Amini, P. (2019), "The WHO-5 well-being index: a validation study in people with infertility", *Iranian Journal of Public Health*, Vol. 48 No. 11, pp. 2058-2064, doi: [10.18502/ijph.v48i11.3525](https://doi.org/10.18502/ijph.v48i11.3525).
- Panchal, U., Salazar de Pablo, G., Franco, M., Moreno, C., Parellada, M., Arango, C. and Fusar-Poli, P. (2021), "The impact of COVID-19 lockdown on child and adolescent mental health: systematic review", *European Child and Adolescent Psychiatry*, Vol. 32 No. 7, pp. 1-27, doi: [10.1007/s00787-021-01856-w](https://doi.org/10.1007/s00787-021-01856-w).
- Pierce, M., Hope, H., Ford, T., Hatch, S., Hotopf, M., Kontopantelis, E., Webb, R., Wessely, S., McManus, S. and Abel, K.M. (2020), "Mental health before and during the COVID-19 pandemic: a longitudinal probability sample survey of the UK population", *The Lancet Psychiatry*, Vol. 7 No. 10, pp. 883-892, doi: [10.1016/S2215-0366\(20\)30308-4](https://doi.org/10.1016/S2215-0366(20)30308-4).
- Psychiatric Center North Zealand (2022), "WHO-five well-being index (WHO-5)", available at: <https://www.psykiatri-regionh.dk/who-5/Pages/default.aspx> (accessed 26 December 2022).
- Qiu, J., Shen, B., Zhao, M., Wang, Z., Xie, B. and Xu, Y. (2020), "A nationwide survey of psychological distress among Chinese people in the COVID-19 epidemic: implications and policy recommendations", *General Psychiatry*, Vol. 33 No. 2, e100213, pp. 1-4, doi: [10.1136/gpsych-2020-100213](https://doi.org/10.1136/gpsych-2020-100213).
- Ravaldi, C., Ricca, V., Wilson, A., Homer, C. and Vannacci, A. (2020), "Previous psychopathology predicted severe COVID-19 concern, anxiety, and PTSD symptoms in pregnant women during 'lockdown' in Italy", *Archives of Women's Mental Health*, Vol. 23 No. 6, pp. 783-786, doi: [10.1007/s00737-020-01086-0](https://doi.org/10.1007/s00737-020-01086-0).
- Sabbah, S. (2022), *Effect of COVID-19 on the Wellbeing of Healthcare Professionals in Public Isolation Hospitals in Egypt*, [Master's Thesis, The American University in Cairo]. AUC Knowledge Fountain, available at: <https://fount.aucegypt.edu/etds/1899>
- Sagar, S., Nusrat, F., Rashid, Md., Ghosh, P., Sultana, M., Ahsan, A., Pinky, S., Mahboob, R., Nayon, S., Shariful Islam, S. and Hossain Hawlader, M. (2022), "Mental health status of married women during COVID-19 pandemic in Bangladesh: a cross-sectional study", *Helion*, Vol. 8 No. 1, e08785, pp. 2405-8440, doi: [10.1016/j.heliyon.2022.e08785](https://doi.org/10.1016/j.heliyon.2022.e08785).
- Seck, P.A., Encarnacion, J.O., Tinonin, C. and Duerto-Valero, S. (2021), "Gendered impacts of Covid-19 in Asia and the Pacific: early evidence on deepening socioeconomic inequalities in paid and unpaid work", *Feminist Economics*, Vol. 27 Nos 1-2, pp. 1-16, doi: [10.1080/13545701.2021.1876905](https://doi.org/10.1080/13545701.2021.1876905).
- Semo, B.W. and Frissa, S.M. (2020), "The mental health impact of the COVID-19 pandemic: implications for Sub-Saharan Africa", *Psychology Research and Behavior Management*, Vol. 13, pp. 713-720, doi: [10.2147/PRBM.S264286](https://doi.org/10.2147/PRBM.S264286).
- Sempungu, J.K., Choi, M., Lee, E.H. and Lee, Y.H. (2023), "Changes in household size in the Republic of Korea and depression: a temporal analysis", *Asia Pacific Journal of Public Health*, Vol. 35 Nos 2-3, pp. 214-216, doi: [10.1177/10105395231160340](https://doi.org/10.1177/10105395231160340).
- Serafini, G., Parmigiani, B., Amerio, A., Aguglia, A., Sher, L. and Amore, M. (2020), "The psychological impact of COVID-19 on the mental health in the general population", *QJM: Monthly Journal of the Association of Physicians*, Vol. 113 No. 8, pp. 531-537, doi: [10.1093/qjmed/hcaa201](https://doi.org/10.1093/qjmed/hcaa201).

- Shahriarirad, R., Erfani, A., Ranjbar, K., Bazrafshan, A. and Mirahmadizadeh, A. (2021), "The mental health impact of COVID-19 outbreak: a nationwide survey in Iran", *International Journal of Mental Health Systems*, Vol. 15 No. 1, 19, pp. 1-13, doi: [10.1186/s13033-021-00445-3](https://doi.org/10.1186/s13033-021-00445-3).
- Shepherd, D.L. (2022), "Food insecurity, depressive symptoms, and the salience of gendered family roles during the COVID-19 pandemic in South Africa", *Social Science and Medicine*, Vol. 301, 114830, doi: [10.1016/j.socscimed.2022.114830](https://doi.org/10.1016/j.socscimed.2022.114830).
- Shreffler, J., Petrey, J. and Huecker, M. (2020), "The impact of COVID-19 on healthcare worker wellness: a scoping Review", *The Western Journal of Emergency Medicine*, Vol. 21 No. 5, pp. 1059-1066, doi: [10.5811/westjem.2020.7.48684](https://doi.org/10.5811/westjem.2020.7.48684).
- Shuwiekh, H.A.M., Kira, I.A., Sous, M.S.F., Ashby, J.S., Alhuwailah, A., Baali, S.B.A., Azdaou, C., Oliemat, E.M. and Jamil, H.J. (2022), "The differential mental health impact of COVID-19 in Arab countries", *Current Psychology (New Brunswick, N.J.)*, Vol. 41 No. 8, pp. 5678-5692, doi: [10.1007/s12144-020-01148-7](https://doi.org/10.1007/s12144-020-01148-7).
- Sieverding, M., Krafft, C., Selwaness, I. and Nassif, A.A. (2023), "Impacts of the COVID-19 pandemic on subjective wellbeing in the Middle East and North Africa: a gender analysis", *PLoS ONE*, Vol. 18 No. 5, e0286405, pp. 1-16, doi: [10.1371/journal.pone.0286405](https://doi.org/10.1371/journal.pone.0286405).
- Singh, S., Roy, D., Sinha, K., Parveen, S., Sharma, G. and Joshi, G. (2020), "Impact of COVID-19 and lockdown on mental health of children and adolescents: a narrative review with recommendations", *Psychiatry Research*, Vol. 293, 113429, doi: [10.1016/j.psychres.2020.113429](https://doi.org/10.1016/j.psychres.2020.113429).
- Spinardi, A., Isamiddinova, N., Clavijo, I. and Henkens, K. (2022), *Mental Health and Gender Inequality in the MENA Region: an Analysis of Shock Related Factors within the Context of the COVID-19 Pandemic*, (working paper no.248), Agence Française de Développement.
- Srivastava, K. (2009), "Urbanization and mental health", *Industrial Psychiatry Journal*, Vol. 18 No. 2, pp. 75-76, doi: [10.4103/0972-6748.64028](https://doi.org/10.4103/0972-6748.64028).
- Süß, C.A. and Weipert-Fenner, I. (2022), "One crisis among many: russia's war in Ukraine and its implications for the MENA region", *Z Friedens und Konfliktforsch*, Vol. 11 No. 2, pp. 255-265, doi: [10.1007/s42597-022-00081-9](https://doi.org/10.1007/s42597-022-00081-9).
- Tavakol, M. and Dennick, R. (2011), "Making sense of Cronbach's alpha", *International Journal of Medical Education*, Vol. 2, pp. 53-55, doi: [10.5116/ijme.4dfb.8dfd](https://doi.org/10.5116/ijme.4dfb.8dfd).
- Tham, W.W., Sojli, E., Bryant, R. and McAleer, M. (2021), "Common mental disorders and economic uncertainty: evidence from the COVID-19 pandemic in the U.S", *PLoS ONE*, Vol. 6 No. 12, e0260726, doi: [10.1371/journal.pone.0260726](https://doi.org/10.1371/journal.pone.0260726) PMID:34855850.
- Thomas, K. (2019), *Challenges of Healthcare in the Middle East and North Africa*, Princeton University, Arab Barometer.
- Topp, C.W., Østergaard, S.D., Søndergaard, S. and Bech, P. (2015), "The WHO-5 Well-Being Index: a systematic review of the literature", *Psychotherapy and Psychosomatics*, Vol. 84 No. 3, pp. 167-176, doi: [10.1159/000376585](https://doi.org/10.1159/000376585).
- UN Women (2021), "The shadow pandemic: violence against women and girls and COVID-19", available at: <https://www.unwomen.org/en/news/in-focus/gender-equality-in-covid-19-response/violence-against-women-during-covid-19> (accessed 29 January 2023).
- Van de Wiel, W., Castillo-Laborde, C., Francisco Urzúa, I., Fish, M. and Scholte, W. (2021), "Mental health consequences of long-term stays in refugee camps: preliminary evidence from Moria", *BMC Public Health*, Vol. 21 No. 1, p. 1290, doi: [10.1186/s12889-021-11301-x](https://doi.org/10.1186/s12889-021-11301-x).
- Verma, K. (2020), "The mental health impact of the COVID-19 epidemic on college students in India", *Asian Journal of Psychiatry*, Vol. 53, 102398, pp. 1-3, doi: [10.1016/j.ajp.2020.102398](https://doi.org/10.1016/j.ajp.2020.102398).
- Villatoro, A.P., Wagner, K.M., Salgado de Snyder, V.N., Garcia, D., Walsdorf, A.A. and Valdez, C.R. (2022), "Economic and social consequences of COVID-19 and mental health burden among Latinx young adults during the 2020 pandemic", *Journal of Latinx Psychology*, Vol. 10 No. 1, pp. 25-38, doi: [10.1037/lat0000195](https://doi.org/10.1037/lat0000195).

- Wang, C., Pan, R., Wan, X., Tan, Y., Xu, L., McIntyre, R.S., Choo, F.N., Tran, B., Ho, R., Sharma, V.K. and Ho, C. (2020), "A longitudinal study on the mental health of general population during the COVID-19 epidemic in China", *Brain, Behavior, and Immunity*, Vol. 87, pp. 40-48, doi: [10.1016/j.bbi.2020.04.028](https://doi.org/10.1016/j.bbi.2020.04.028).
- Ward, K.P. and Lee, S.J. (2022), "Associations of food insecurity and material social support with parent and child mental health during COVID-19", *Children and Youth Services Review*, Vol. 140, 106562, pp. 1-8, doi: [10.1016/j.chilcyouth.2022.106562](https://doi.org/10.1016/j.chilcyouth.2022.106562) PMID:35698461.
- Witteveen, A.B., Young, S., Cuijpers, P., Ayuso-Mateos, J.L., Barbui, C., Bertolini, F., Cabello, M., Cadorin, C., Downes, N., Franzoi, D., Gasior, M., John, A., Melchior, M., McDaid, D., Palantza, C., Purgato, M., Van der Waerden, J., Wang, S. and Sijbrandij, M. (2022), "Remote mental health care interventions during the COVID-19 pandemic: an umbrella review", *Behaviour Research and Therapy*, Vol. 159, 104226, pp. 1-13, doi: [10.1016/j.brat.2022.104226](https://doi.org/10.1016/j.brat.2022.104226).
- World Bank (2023), "World development indicators", available at: <https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG?locations=JO-MA-EG-TN> (accessed 23 January 2023).
- World Health Organization (2010), *Mental Health Systems in the Eastern Mediterranean Region-Report Based on the WHO Assessment Instrument for Mental Health Systems*, WHO Regional Office for the Eastern Mediterranean, Cairo.
- World Health Organization (2022), *Mental Health Atlas 2020: Review of the Eastern Mediterranean Region*, WHO Regional Office for the Eastern Mediterranean, Cairo.
- World Health Organization (2023), *Refugee And Migrant Health Country Profile: Jordan*, WHO Regional Office for the Eastern Mediterranean, Cairo.
- Wu, Y., Zhang, C., Liu, H., Duan, C., Li, C., Fan, J., Li, H., Chen, L., Xu, H., Li, X., Guo, Y., Wang, Y., Li, X., Li, J., Zhang, T., You, Y., Li, H., Yang, S., Tao, X., Xu, Y., Lao, H., Wen, M., Zhou, Y., Wang, J., Chen, Y., Meng, D., Zhai, J., Ye, Y., Zhong, Q., Yang, X., Zhang, D., Wu, X., Chen, W., Dennis, C.L. and Huang, H.F. (2020), "Perinatal depressive and anxiety symptoms of pregnant women during the coronavirus disease 2019 outbreak in China", *American Journal of Obstetrics and Gynecology*, Vol. 223 No. 2, pp. 240.e1-240.e9, doi: [10.1016/j.ajog.2020.05.009](https://doi.org/10.1016/j.ajog.2020.05.009).
- Xie, Y., Xu, E. and Al-Aly, Z. (2022), "Risk of mental health outcomes in people with Covid-19: cohort study", *BMJ*, Vol. 376, e068993, doi: [10.1136/bmj-2021-068993](https://doi.org/10.1136/bmj-2021-068993).
- Xiong, J., Lipsitz, O., Nasri, F., Lui, L.M.W., Gill, H., Phan, L., Chen-Li, D., Iacobucci, M., Ho, R., Majeed, A. and McIntyre, R.S. (2020), "Impact of COVID-19 pandemic on mental health in the general population: a systematic review", *Journal of Affective Disorders*, Vol. 277, pp. 55-64, doi: [10.1016/j.jad.2020.08.001](https://doi.org/10.1016/j.jad.2020.08.001).
- Yang, D., Hu, B., Ren, Z. and Li, M. (2022), "Impact of income on mental health during the COVID-19 pandemic: based on the 2020 China family panel survey", *Frontiers in Psychology*, Vol. 13 No. 977609, pp. 1-12, doi: [10.3389/fpsyg.2022.977609](https://doi.org/10.3389/fpsyg.2022.977609).
- Zhang, Y. and Ma, Z.F. (2020), "Impact of the COVID-19 pandemic on mental health and quality of life among local residents in Liaoning Province, China: a cross-sectional study", *International Journal of Environmental Research and Public Health*, Vol. 17 No. 7, 2381, pp. 1-12, doi: [10.3390/ijerph17072381](https://doi.org/10.3390/ijerph17072381).

Corresponding author

Pakinam Mahmoud Fikry can be contacted at: pakinam_fikry@feps.edu.eg, pakinam_fikry@cu.edu.eg

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