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REVIEW

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# The epidemiology of common mental disorders in Libya: a systematic review

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## Abstract

**Introduction:** There has been a global increase in the prevalence of common mental disorders (CMD), particularly in conflict hotspots. The limited amount of resources is one of the key barriers to effective treatment within Low- and Middle-income countries (LAMICs). The lack of service provision for mental health disorders in LAMICs has resulted in limited opportunities to conduct mental health research. Libya is a North African country that has suffered from ongoing conflict with the current political unrest in Libya further impacting the mental health of the population.

**Main text:** The aim of this review is to conduct a synthesis of evidence regarding the estimated prevalence and associated risk factors of CMD in Libya. A search was completed in the academic databases; PubMed, Medline, EMBASE, PsychINFO, CINHALL, and the Institute for Development, Research, Advocacy and Applied Care (IDRAAC) from inception to March 2020. Only studies that investigated prevalence and associated risk factors of CMD in Libya were included. A total of 219 studies were identified of which 15 met the inclusion criteria for the review. There were ( $n = 3$ ) papers investigated the prevalence of depression, ( $n = 4$ ) studies were focused on stress-related disorders and the remaining papers looked at both anxiety and depression. Statistically, sample sizes of the included studies ranged from ( $n = 41-13,031$ ) for the prevalence studies (mean = 1188.6, median = 233).

**Conclusion:** The status of Libya as a conflict hotspot has led to a reduced level of epidemiological data on mental health, with a vital need to conduct research in CMD. Libya requires better clinical governance which can allow for more scientific research into CMD and enabling the Libyan government to develop evidence-based policy initiatives for CMD.

**Keywords:** Anxiety, Depression, Libya, Mental health, Psychiatric, Prevalence, Risk factors

## Introduction

The prevalence of Common Mental Disorders (CMD) has been increasing globally, with areas in the in-conflict zones, in particular experiencing considerable morbidity and mortality due to CMD [1, 2]. The limited research and epidemiological data from low resource settings is a major barrier to the delivery of effective treatment approaches within Low- and Middle-Income Countries (LAMICs) [3]. In addition, civil war and political unrest further increases the challenges of carrying out robust

research [4]. Libya has been fragmented by civil war since February 2011, with limited research data regarding the current situation of CMD within this setting [5].

CMD are one of the leading causes of disability in the global burden of disease [6–8]. CMD includes depressive and anxiety disorders, which make up a significant proportion of morbidity seen within health care services [9]. Morbidity due to CMD has been reported to have a negative impact on wider socioeconomic health outcomes [1]. The prevalence of CMD shows large variations, particularly reported to be higher in LMICs [10] and is significantly more prevalent among women than men and those with comorbid physical illnesses [11].

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In Libya the political unrest has led to the inadequate availability of health services, particularly mental health services [5, 12]. Lack of resources and health care provision further limits access to evidence-based mental health treatments. In addition, mental health disorders are associated with several risk factors, such as childhood trauma, low socioeconomic status, neglect, stressful life events and other trauma [13–15]. In Libya, the civil war may have caused significant complex trauma and is leading to an increase in the incidence of mental health disorders [5].

Furthermore, in Libya, Okasha and colleagues [16] reported that per 100,000 population, the country has approximately 0.2 psychiatrists, 5 psychologists, 0.05 psychiatric nurses and 1.5 social workers, highlighting the scarcity of trained mental health professionals to meet the needs of the estimated population of 6.73 million [5, 12]. This coupled with the limited access to psychiatric services both within inpatient and community mental health settings, results in an urgent need for research to bridge this mental health treatment gap [5]. In addition, Libya is a country consisting of mainly remote and rural settings, which requires the strengthening of mental health service provision, by providing broader geographical coverage while still being cost-effective [5]. This includes the integration of mental health care into primary care services which can help reduce the treatment gap within LMICs, such as Libya [17]. A lack of stable healthcare infrastructure, poor clinical governance and limited research capacity strengthening initiatives, is the current situation being experienced in conflict settings, particularly Libya [4]. Therefore, a service user led approach may act as the required building blocks when changing the way mental health care is provided in Libya. Taking into account the limited availability of epidemiological data in Libya, the present systematic review aimed to conduct a synthesis of the available evidence on the estimated prevalence and associated risk factors of CMD in Libya.

## Main text

### Aim

The aim of this review is to conduct a synthesis of evidence regarding the estimated prevalence and associated risk factors of CMD in Libya.

## Methods

### Search strategy

A search was conducted on the following databases: PubMed, Medline, EMBASE, PsychINFO, CINHAI and Institute for Development, Research, Advocacy and Applied Care (IDRAAC) from database inception to

March 2020. The search strategy consisted of Medical Subject Headings (MeSH) and search terms related to “Libya”, “depression”, “anxiety”, “psychiatric” and “mental disorders”. The use of these specific keywords was adapted from a previous literature review conducted by Mirza and colleagues [18] (See Additional file 1 for full search strategy).

### Inclusion and exclusion criteria

The main variables of interest for the search were the identified prevalence and associated risk factors of CMD in Libya. The systematic review included papers which had a focus on (a) CMD, as outlined in Mirza and colleagues [18] and (b) were conducted within Libya. Studies were excluded if they were published as poster publications, conference abstracts or did not have an outcome which was associated with CMD.

### Data synthesis

On completion of the search the data gathered was extracted from the online databases. First, two reviewers (AR and MA) screened the relevant studies by reviewing the titles and abstracts of the identified papers. In the second stage, the reviewers evaluated and assessed the full manuscripts of all selected papers independently. The reviewers then independently evaluated the study characteristics including first author, year of publication, sample size and setting to determine the suitability of the paper for inclusion. Any disagreements were resolved by senior author (NH).

### Use of hand search

Due to the limited availability of research literature in relation to mental health in Libya [12], we removed all date and language restrictions to ensure a broad search of the available evidence. A hand search was conducted to examine any grey literature that could be obtained either online or by direct contact with identifiable authors. This involved screening the reference lists of all eligible publications for further published reports and citations of unpublished research. Other sources internet search engines (Google, Google Scholar) were also explored for research related to the key words. However, the Google Scholar search was limited to the first 150 most relevant articles. In addition, there were multiple attempts to contact experts in the field from Libya for any unpublished papers.

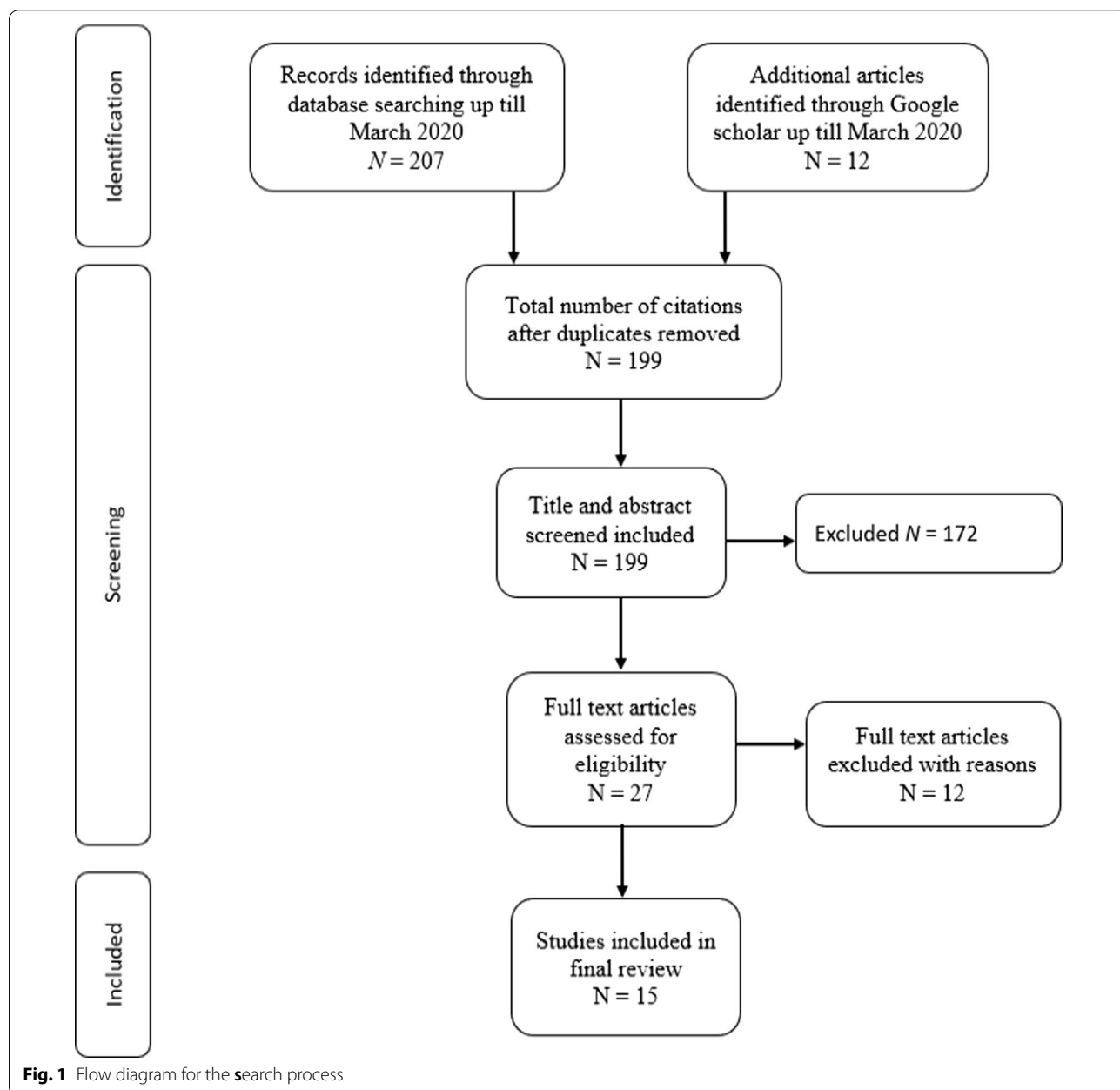
The search results of the grey literature were then examined against the inclusion criteria of the review. To keep the process both replicable and transparent, the unfiltered search results were saved and retained for future potential re-analysis. However, due to the

ongoing political unrest, we were not able to contact some experts in the field in Libya for ( $n=2$ ) articles published in the Jamahiriya Medical Journal. Our grey literature search was unable to retrieve unpublished materials or grey literature.

Overall, a total of ( $n=15$ ) papers met the inclusion criteria and were included as part of the review which included all original research papers that focused on CMD, primarily anxiety and/or depression in Libya. (See Consort diagram for further details of included/excluded studies).

**Results**

The initial search identified 219 papers, of which fifteen were non-duplicated papers that met the inclusion criteria of the review. A total of fourteen were cross sectional studies and one was a case-control study which is shown in Fig. 1. We did not find any prospective studies on the natural course of CMD or rigorously controlled trials which provided estimates of prevalence data. The sample sizes of the included studies ranged from ( $n=41-13,031$ ) for prevalence studies (mean=1188.6, median=233).



Furthermore, the total sample size for all studies was ( $n=19,017$ ) with an age range of 5–75 years.

### Study characteristics

The majority of the studies were conducted within urban settings in the following locations: Benghazi city ( $n=3$ ), Sebha city ( $n=3$ ) and Tripoli city ( $n=2$ ). There were ( $n=10$ ) papers that discussed CMD prevalence, while ( $n=8$ ) provided information on the associated psychosocial risk factors on mental health. There were ( $n=2$ ) papers that discussed maternal wellbeing, with ( $n=1$ ) assessing the relationship between anaemia in pregnant women and mental health during pregnancy.

There were ( $n=2$ ) papers that met the initial screening criteria, however, did not meet the systematic review inclusion criteria. A cross-sectional study by Nieporent and colleagues [19] investigated the relationship between harsh environmental factors, such as living in the Sahara desert and developing a mental health condition. However, we excluded this study as it only included United State of America army personnel who were stationed in Libya and came from a different cultural and social background. In addition, Stanford and colleagues [20] conducted a feasibility study on the efficacy of a 10-week peer-led group-based recovery intervention for post-traumatic stress disorder (PTSD) due to war-related trauma. This paper primarily targeted the likelihood of completing the intervention successfully rather than focusing on using a valid clinical diagnostic tool to identify psychiatric prevalence or associated risk factors.

### Methodological quality of included studies

Due to the lack of papers identified as part of the search with varying primary outcome measures, we did not conduct a formal assessment of the methodological assessment of quality. However, we have provided an overview of the methodological quality of the studies using the Mirza and colleagues [18] Checklist (see Table 1) which has been used in a similar review conducted in Iran [21]. Out of the ( $n=15$ ) papers, there were only three papers that gave adequate details of the methodology used. Therefore, it was challenging to accurately comment on any possible biases. Furthermore, none of the studies implemented any measure to control for selection bias and only two described their chosen group as a random sample. This also negatively affected representativeness of the data to draw a general conclusion. The Elmenfi and colleagues [22] paper was the only study that discussed and interpreted its null results in terms of its statistical significance, while all the remaining papers did not describe their null findings. There were two papers [23, 24] that did not mention or comment on the generalisability of its results to the wider population of Libya.

### Prevalence of CMD

A total of ( $n=3$ ) papers investigated the prevalence of depression. Avasthi and colleagues [25] conducted a cross-sectional study in a psychiatric hospital at Benghazi city. The study reviewed patient care records to examine if the participant had a diagnosis of neurotic depression, based on the diagnostic criteria of the International Classification of Diseases, 9th revision (ICD-9), with overall prevalence of 58.6% depression reported by Avasthi and colleagues [25]. El Gatit and colleagues [24] also investigated the prevalence of depression in patients undergoing anticoagulation therapy for cardiac valve replacement. The study was conducted in Misurata city and focused on depression associated with chronic disease and evaluated the impact of depression on treatment adherence. El Gatit and colleagues [24] used a self-report questionnaire in a sample of ( $n=62$ ) cardiac patients to determine depressive symptoms, with the prevalence of depression being reported as 35.5%. Finally, Alan-sari [26] conducted a study in Sebha city, using the Beck Depression Inventory in undergraduate university students, reporting a mean score (SD) for depression of 22.7 ( $\pm 12.6$ ). All three papers were cross sectional studies but used varied depression assessment tools which ranged from diagnostic criteria such as ICD-9 or Beck Depression Inventory to brief screening instruments such as Center for Epidemiologic Studies Depression Scale (CES-D). Table 2 provides data on the estimated prevalence of anxiety and depressive disorders in the included studies.

There were a number of studies which examined both anxiety and depression ( $n=6$ ) within a specified population in Libya. These studies were completed in differing samples, including undergraduate university students ( $n=3$ ), dental patients ( $n=1$ ), paediatric dermatology ( $n=1$ ) and maternal and obstetrics ( $n=1$ ). The studies conducted by Salam and colleagues [27], El Ansari and colleagues [28] and Khalil [29] investigated the relationship between mental wellbeing in undergraduate students and analysed a range of associated variables, such as general health status, socio-demographics and health behaviours, respectively. The studies all used a cross-sectional study design, including outcome measures, such as the EuroQoL (EQ-5D) and Self-rated Health Questionnaire to estimate the prevalence of depression and anxiety [28, 29]. Therefore, it was not possible to use the data from these studies to provide exact figures of CMD in the youth population at university level. However, the study by Al-Okali, and colleagues [30] investigated participants from a younger age group (6–14 years) and used a validated tool, the standardized Arabic version of the Children Depression Inventory to explore the correlation between common dermatological conditions in children and likelihood of developing anxiety or depression. The

**Table 1** Checklist for quality of studies included in systematic review of evidence on CMD in Libya

Reference	Explicit aims	Sample size justification or adequate	Justification sample representative of population	Inclusion and exclusion criteria stated	Reliability and validity of measures justified	Response rate and drop out specified	Data adequately described	Statistical significance assessed	Discussion of generalizability	Null findings interpreted
[25]	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	NA
[26]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	NA
[24]	Yes	Yes	Yes	No	Yes	No	Yes	Yes	No	NA
[30]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	NA
[31]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	NA
[27]	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	NA
[28]	Yes	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	NA
[33]	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	NA
[34]	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	NA
[23]	Yes	Yes	Yes	No	No	No	Yes	Yes	No	NA
[29]	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	NA
[22]	Yes	Yes	Yes	No	Yes	No	Yes	Yes	Yes	Yes
[32]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA
[36]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA
[35]	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	NA

Adapted from Mirza and colleagues [18]

**Table 2** Published papers on the prevalence and associated risk factors from inception to March 2020

Author	Aim	Relevant Disorder	Study design	Settings	Study population (sexes), age range (years)	Outcome measures	Key findings
[25]	Present sociodemographic and diagnostic characteristics of psychiatric inpatients in Eastern Libya	Neurotic depression based on ICD-9 classification	Cross sectional	Psychiatric hospital, Benghazi city	1009 psychiatric patients (both), ≥ 15	ICD-9 manual	Prevalence: 58.6% (65/111) of patients with neurotic disorders developed neurotic depression The key risk factors identified: young age, being single and doing military services Mean (SD) = 22.7 (± 12.6) The scale could be a successful rapid screening device for depression and especially useful in future epidemiological/ prevalence studies
[26]	Examining the adequacy and consistency of Beck Depression Inventory second edition in Arabic population	Depression	Cross sectional	Sebha city	298 Undergraduate students, (both), 18–25	Beck Depression Inventory using an Arabic version of the BDH-II	Prevalence: 35.5% (22/62) with mean age (SD) = 51 (± 7.1)
[24]	Assessing the relationship between depression and non-adherence to anticoagulant therapy after valve replacement	Depression	Cross sectional	Anhour Clinic, Red Crescent, Misurata city	62 cardiac patients (both), 38–60	CES-D and Spielberger State-Trait Anxiety Inventory	Prevalence: Mean score (SD) of depression is 12.1 (± 4) in dermatology children, while it is 9.7 (± 3.3) in control group at P value < 0.05 Mean score (SD) of anxiety is 19.9 (± 6.4) in dermatology children, while it is 13.2 (± 5.6) in control ones at (P < 0.05) The key risk factors identified: dermatological conditions such as acne (that are associated with cosmetic impact) increase vulnerability to develop depressive disease. Female gender.
[30]	To assess depression and anxiety in children with some skin diseases	Anxiety and depression	Case-control	Al Wahda hospital and Community Health Center, Derna city	100 children, (both), 6–14	Standardized Arabic version of CDI and anxiety assessment using anxiety manifest scale for children	The was no general conclusion that was drawn from this study
[31]	Investigating the differences between high academic achievement and of low academic achievement students in the variables of intelligence and exam anxiety	Anxiety	Cross sectional	Zawia city	302 Undergraduate students, (both), ≥ 15	Arabic version of STAI	



**Table 2** (continued)

Author	Aim	Relevant Disorder	Study design	Settings	Study population (sexes), age range (years)	Outcome measures	Key findings
[27]	To assess the physical, mental, emotional and social health status of adolescents and youths attending university and to determine variables associated with their health status	Anxiety and depression	Cross sectional	Benghazi city	383 Undergraduate students, (both), 17–24	EQ-5D questionnaire	Prevalence: 62.7% (240/282) Males: 51.3% (79/154) and females: 70.3% (161/229) The key risk factors identified: Smoking and low levels of physical activity, especially among women
[28]	To assess the frequencies of self-reported students' symptoms and two stressors (educational related and general overall) To examine the associations between certain health complaints and students' socio-demographics and health behaviours/lifestyle features	Anxiety and depression	Cross sectional	Cross Libya (Misurata, Sabha, Zawea, Sirt, Al Bida, Benghazi and Tripoli cities)	1567 Undergraduate students, (both), ≥ 15	General student health survey	Prevalence: 749/1300 (57.6%) depressive mood, 738/1300 (56.85%) difficulties to concentrate The key risk factors identified: female gender, academic performance, income insufficiency
[33]	To investigate the association of mental well-being and depression with periodontal clinical attachment loss among young adults in post-war urban population	Anxiety and depression	Cross sectional	Sebha city	Random 147 participants (both), 15–35	Arabic version of WHO five well-being index and major depression inventory	Prevalence: 40.81% had poor mental well-being The key risk factors identified: depression is more common in female (73.3%) but its severity is more linked with male gender
[34]	To determine the degree of anaemia among pregnant women and to assess the depression, anxiety and stress among the anaemia in pregnancy women	Anxiety and depression	Cross sectional	Sebha city	258 pregnant women, no exact data	DASS 21	Prevalence: depression 43.4% (112/258), anxiety 25% (65/258) and stress 31.4% (81/258)
[23]	Not stated clearly compared the rates of preterm, low-birthweight and caesarean-section births in ware-zone area)	Anxiety (psychosocial stress)	Cross sectional	Al-Jamhouria hospital, Benghazi city	13,031 pregnant women, (mean age of mothers delivering in the conflict period was 30.1 years, whereas the average pre-conflict age was 30.4	NA	NA



**Table 2** (continued)

Author	Aim	Relevant Disorder	Study design	Settings	Study population (sexes), age range (years)	Outcome measures	Key findings
[29]	To determine the rates of anxiety and depression among higher education students in Libya so basic data can be provided to the university health program for planning related to the health need for students	Anxiety and depression	Cross sectional	Cross Libya	Random 1300 undergraduate students; (both), 17–34	Self-rated health questionnaire derived from the ACHA (2005) "Within the last school year, have you been diagnosed with anxiety?" "Within the last school year, have you been diagnosed with depression?"	Prevalence: anxiety was 8.8% (114/1300) and depression was 4.3% (56/1300) Key risk factors identified: insufficient social support and female gender
[22]	To investigate the effect of social evaluation on Public Speaking Anxiety of English foreign language learners	Anxiety (Public Speaking Anxiety)	Cross sectional	Omar Al-Mukhtar university, Al Bayda city	Random 111 undergraduate students; (both), ≥ 15	Self-designed questionnaire asking student how they felt	NA
[32]	To cross-culturally adapt the PASS-20 questionnaire for use in Libya	Anxiety	Cross sectional	Ibn Sina hospital, Sirt city	208 (patients and unpaid undergraduate Students), (both) (42 women)	Arabic PASS-20 and the Arabic Pain Rating Scales	NA
[36]	To investigate whether Libyan primary and secondary schoolteachers experience depression, anxiety and stress manifestation throughout job programmers	Anxiety and depression	Cross sectional	Tripoli city	200 primary and secondary school teachers, (both), 22–65	Arabic version of DASS-21	Prevalence: depression: 44.5% (89/200), anxiety 56% (112/200) and stress: 39.5% (79/200) The key risk factors identified: career as teacher (DAS), low teaching experience (DAS), smoking (anxiety), high workload demand (DAS)
[35]	To examine the effects of psychoeducation and stress management techniques on PTSD symptoms in Libya	Anxiety (PTSD)	Cross sectional	Tripoli city	41 volunteers, (both), 19–51	PTSD Checklist (PCL) which correspond to the DSM-5 criteria B, C, and D, respectively (A cut off point of 35 to 50 is PTSD diagnosis) Coping Inventory for Stressful Situations (CISS) developed by Endler and Parker (1990)	Prevalence: 15% met the diagnostic criteria for PTSD

Adapted from Mirza and colleagues [18]

ICD-9 International Classification of Diseases Ninth revision, BDI-II Beck Depression Inventory 1–2, CES-D Centre of Epidemiological Studies Depression scale, CDI Children Depression Inventory, EQ-5D EuroQoL, STAI Spielberger State–Trait Anxiety Inventory, WHO World Health Organization, DASS 21 Depression, Anxiety and Stress Scale—21 Items, ACHA American College Health Association Survey, PASS-20 Pain Anxiety Symptoms Scale-20, PTSD Posttraumatic Stress Disorder (PTSD), Standard Deviation (SD)

outcomes of this paper were reported as a mean score (SD) for depression of 12.1 ( $\pm 4$ ) in children with skin disease, while the mean score (SD) was 9.7 ( $\pm 3.3$ ) in the control group ( $P < 0.05$ ).

#### **Undergraduate education and mental health**

A total of ( $n=7$ ) studies [22, 26–29, 31, 32] used cross-sectional design and explored different presentations of CMD in undergraduate students. However, only ( $n=3$ ) of these studies focused on anxiety alone and tried to analyse its impact on students. The first one was Almazghoob [31] study which investigated stress on academic achievement, while Elmenfi and colleagues [22] looked at the relationship between the performance of English foreign language learners and anxiety. The final one by Tashani and colleagues [32] was cross-cultural study that investigated the Pain Anxiety Symptoms Scale-20 (PASS-20) questionnaire in sample of Libyan students.

#### **Oral health and mental disorders**

One of the included studies examined mental health in a dental clinic in Sebha city [33]. This study was conducted on a random sample of 147 individuals within an urban setting in post-war Libya and investigated the mental well-being of a periodontal clinical population. A total of 40.8% of participants reported poor mental well-being using the Arabic versions of the World Health Organization (WHO) five-item well-being index and Major Depression Inventory.

#### **Maternal Mental Health**

Jiji and colleagues [34] and Bodalal and colleagues [23] looked at the association between anaemia in pregnancy and mental health, while the second paper explored the correlation between traumatic stress from living in a war-zone area and rates of preterm, low-birthweight and caesarean-section births. Unlike, Bodalal and colleagues [23] study which lacked the use of a validated psychological tool to diagnose anxiety or depression, the Jiji and colleagues [34] study used the DASS 21 survey which allowed for an estimation of the prevalence of anxiety and depression. The results of the study found no significant difference in terms of correlation between CMD (depression 43.4% and anxiety 25%) and developing anaemia.

#### **War trauma and PTSD**

The only paper which investigated an anxiety-related disorder in association with ongoing war in Libya was conducted by Mughairbi and colleagues [35]. The study aimed at assessing the effectiveness of psychoeducation and stress management techniques on PTSD symptoms. The study involved a sample of ( $n=41$ ) volunteers from the capital Tripoli and assessed each participants

exposure to the February 2011 events. A total of 15% of the sample were reported as experiencing PTSD based on the Diagnostic and Statistical Manual of Mental Disorders (DSM–5) criteria Mughairbi and colleagues [35].

#### **Risk factors**

Factors such as the female gender was reported as a potential risk factor for CMD in the Libyan population. This was evident in El Ansari and colleagues [28] and Khalil [29] studies which were conducted in undergraduate students from different Libyan institutions and cities. The studies showed a significant positive association between CMD and being a female student. Al-Okali, and colleagues [30] study reported a higher level of poor mental health among Libyan women in comparison to men even though the gender difference in this paper did not reach a statistical significance. There were few explanations why being a woman could increase your risk of CMD. Khalil [29] stated females were more likely to struggle with an increased pressure especially from their study so they are less able to cope well, while Al-Okali, and colleagues [30] study stated that dermatological conditions such as psoriasis are associated with social stigma and make females more sensitive in self-esteem. On the other hand, the Avasthi and colleagues [25] study found an association between male gender and developing depressive symptoms which was attributed to the high proportion of men who represented the majority of patients in an inpatient psychiatric unit. Furthermore, it was outlined it was more culturally acceptable for Libyan women to seek traditional healers.

The other risk factor that was associated with CMD in Libya was cigarette smoking. Tobacco was found to be a significant predictor of mental ill-health among Libyan men [36]. Out of the 200 secondary school teachers in Tripoli who were involved in the study, 18.5% of them reported cigarette smoking. Participants in the study who smoked were significantly more likely to experience a higher level of anxiety compared with non-smokers [36]. Similarly, the Salam and colleagues [27] study conducted in undergraduate students at the University of Benghazi reported 17.2% of the participants were cigarette smokers. However, Salam and colleagues [27] did not report any significant association with poor mental health status and smoking. Both El ansari and colleagues [28] and Salam and colleagues [27] highlighted that unlike alcohol consumption and drug misuse, smoking was socially acceptable in Libyan society especially for males [27, 28].

Certain occupations, especially those that require high work demand such as teaching and military service were linked to an increased risk of developing CMD [25, 36]. The later study showed teachers in the Tripoli educational area were experiencing high levels of depression,

stress, and anxiety. In addition, they were also more likely to use negative coping mechanisms, such as excess tea/coffee consumption and smoking. In addition, the Avasthi and colleagues [25] study, reported that working in the Libyan Army was one of the strongest risk factors (37%) for developing neurotic disorders, such as depression in comparison to students (6%) or individuals who were unemployed (6%). Mental health and economic circumstances were strongly interconnected, with El Ansari and colleagues [28] reporting a significant association between income insufficiency especially for students who financially support themselves during university and poor mental health. Moreover, the study by El Ansari and colleagues [28] found students who have high academic expectations are more likely to experience CMD.

## Discussion

The aim of the systematic review was to conduct a synthesis of evidence regarding the prevalence and associated risk factors of CMD in Libya. The main findings of the systematic review were the prevalence of CMD which ranged from 4.3 to 58.6% for depression and 8.8–56% for anxiety. However, the results need to be interpreted with caution due to the paucity of robust epidemiological research related to psychiatric morbidity in Libya [12]. This systematic review is the first to investigate the prevalence of CMD in Libya, a Middle East and North African (MENA) nation which has suffered from ongoing conflict and political unrest since February 2011 [37]. It was also noticeable that most of the research was conducted in Urban settings across three major cities in Libya; Benghazi [23, 25, 27], Sebha city [26, 33, 34] and Tripoli [35, 36] which could be due to lack of mental health service provision within rural settings.

The included papers consisted of a variety of outcome measures for CMD from basic socio-economic data to diagnostic tools for CMD [24, 26, 30]. Several depression assessment tools were used ranging from gold standard measures, such as ICD-9 [25], a self-report measure of depressive symptoms [Center for Epidemiologic Studies Depression Scale, (CES-D)] [24] and the Beck Depression Inventory [26]. The last study by Alansari [26] utilised a validated measure of depression in the Arabic language which made it linguistically and culturally appropriate for investigating CMD within this population [38].

From the results, it is evident that maternal mental and physical health has been affected by Libya's war-zone status [23, 34]. PTSD was found to be correlated with pre-term, low-birthweight and caesarean-section births [23]. However, in terms of CMD and physical health conditions there was no correlation found between the prevalence of CMD and anaemia in the Jiji and colleagues [34] study. One of the studies examined the mental health of

dental patients and concluded that 40.8% had poor mental wellbeing [33].

There are an increasing number of young people who are going to university as completing a university education has become an important factor for employment and financial independence [39]. As a result, there is more fund for improving student's wellbeing at university and more interest in developing student's mental health for better academic performance. This was evident on this systematic review as seven out of the fifteen studies were conduct on undergraduate students.

The results of the systematic review suggest that the associated risk factors for CMD have potentially been influenced by political unrest and Libya's war-zone status [5]. Unfortunately, Libya has been involved in many different military conflicts, such as the Egypt–Libya war (1977), Chadian–Libyan conflict (1978–1987), United Nation Sanctions on Libya (1992–1999) and the ongoing Libyan Civil (2011–present). In addition, the significant political unrest has decreased opportunities for the development of mental health service provision and policy initiatives.

The common reported risk factors found in systematic review were smoking, low health awareness, poor socio-economic status and female gender. The significance of sex has also described in other systematic reviews, such as Abdul Razzak and colleagues [40] which was conducted in United Arab Emirates (UAE) and Bener and colleagues [41] which was conducted in Qatar, which also found female sex as a common contributing factors for poor mental health. It is worth mentioning that most studies analysed both depression and anxiety as combined a condition for poor mental health and the associated risk factors were not thoroughly analysed by most of the studies and did not follow a particular pattern.

## Strengths and limitations

Despite the limited availability of prevalence data on CMD within Libya, ( $n = 10$ ) of the included studies were conducted in the Arabic language [23, 24, 26, 29–33, 35, 36] ensuring that the measures used were culturally and linguistically appropriate for the target population. Previous research using validated outcome measures has shown the importance of culturally sensitive language tests when conducting research in non-English speaking countries [42]. The majority of research in mental health is conducted in the west. Therefore, robust methods of culturally validating instruments for the Libyan population is needed. Despite years of turmoil in Libya there were only a handful of studies on mental health that provided limited evidence on the mental health morbidity in this population. The study strengths include a synthesis of the existing data on CMD in Libya and associated risk

factors. The limited resource availability is an issue that should be tackled [12]. Particularly there is little evidence on psychological interventions and research should be carried out in this area which may help in reducing the huge mental health treatment gap.

### Mental Health Research in Libya: the way forward

The results of the systematic review highlight the limited availability of mental health research in Libya. The issue of high psychiatric morbidity is not only in Libya but across the Arab world [16]. The importance of mental health is now being acknowledged; however, appropriate mental health system research, robust mental health epidemiological data and intervention research are urgently needed. The present systematic review has provided an important means of synthesising the available evidence for CMD in Libya, contributing to the evidence base for the prevalence of mental health disorders in a MENA population. An important consideration is that the current pandemic may have led to a rise on mental health problems [43], due to bereavement of loved ones or self-isolation and feelings of loneliness [44]. We consider it will be important to include patients and the public in discussions around improving mental health care through a service-lead care approach in which patient's user lead care approach in which patients' feedback influences the development and strengthening of the healthcare system.

### Conclusions

Mental health is yet to be acknowledged in Libya as a key priority area for research. Understanding the epidemiological basis of mental health disorders can have important implications for the development of mental health services in Libya. Research should focus on the development of culturally sensitive mental health services and the timely translation of research findings into policy and legislative initiatives to support those with mental health difficulties in Libya.

### Abbreviations

CES-D: Center for Epidemiologic Studies Depression Scale; CMD: Common Mental Disorders; DASS: Depression Anxiety Stress Scale; EQ-5D: EuroQoL Questionnaire; LMICs: Low- and Middle-Income Countries; IDRAAC: Institute for Development, Research, Advocacy and Applied Care; ICD-9: International Classification of Diseases, 9th revision; MENA: Middle East and North Africa; NICE: National Institute for Health and Care Excellence; PASS-20: Pain Anxiety Symptoms Scale-20; SD: Standard deviation; WHO: World Health Organization.

### Supplementary Information

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**Additional file 1.** Search strategy.

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### Authors' contributions

MA played a key role in the conception, design of the study, collecting the data, previous literature review, researches regarding this topic and is a key contributor in writing the manuscript. AR was the first person who had an idea about the topic of this systematic review, contributed to structuring the method section and follow-up the writing process. NG is a major contributor in writing the manuscript and the design of the study. AA wrote the introduction section and helped with structuring the references. UA sorted out the data search and ensured the replication of the results. NH provided feedback on the writing process of the manuscript. All authors read and approved the final manuscript.

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### Declarations

#### Ethics approval and consent to participate

Not applicable.

#### Consent for publication

Not applicable.

#### Competing interests

The authors declare that they have no competing interests.

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