

# Mental Health During COVID-19: An Evaluation of Academic Universities' Contribution to Existing Research

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**Abstract:** Increases in mental health problems have been observed during COVID-19 pandemic. Therefore, this topic of research became a priority, especially at the academic level. The objectives of this review were to summarize academic contribution to mental health research during the era of COVID-19. A scoping review of studies conducted at different academic institutions and examining alterations in mental health during the pandemic during the last three years was conducted. Fifty-five studies were included. These focused on different mental health changes that occurred in the era of COVID-19 such as changes in work habits or existing psychological conditions, COVID-19-related fear depression, anxiety and stress. Most of the included studies were observational (76.7%). The majority of the publications were published in Scimago Journal Rank Q1 journals (57.1%). The average number of citations per publication was  $15.3 \pm 30.13$  [0–125]. The number of citations was higher in papers with international collaboration of authors ( $p = 0.031$ ). Publications with COVID-19 as a main objective were more cited than papers not directly related to this subject ( $25.9 \pm 39.45$  vs  $4.14 \pm 3.2$ ;  $p = 0.044$ ). Mental health problems are a common response to the COVID-19 pandemic. The contribution of academic universities to different mental health research studies that took place during COVID-19 outbreak have underlined this reality. However, more representative research from other institutional settings will be needed, particularly in vulnerable populations.

**Keywords:** mental, health, research, contribution, evaluation, COVID-19

## Introduction

Since its outbreak at the end of 2019, the novel coronavirus (SARS-CoV-2) has rapidly spread to be declared a pandemic by the World Health Organization in March 2020.<sup>1</sup> This disease has impacted public health in various forms<sup>2</sup> and affected negatively different health outcomes such as cardiovascular,<sup>3,4</sup> hematological,<sup>5,6</sup> or nephrologic.<sup>7</sup> In parallel, concerns were also raised over a potential mental health crisis fueled by the pandemic and the associated social restrictions imposed by governments to reduce virus transmission.<sup>8,9</sup> Many researchers have described the increased psychological distress and investigated the underlying causes of the deterioration of the quality of life of patients in relation to coronavirus disease (COVID-19).<sup>10,11</sup> Data from the United Kingdom revealed that about 72% of the population were concerned about the effects of COVID-19 on their life, many showed a higher degree of anxiety and a disrupted well-being.<sup>12</sup> Furthermore, a recent systematic review analyzing the effect of the COVID-19 pandemic on mental health showed that the prevalence of signs of adverse mental results was higher when compared to the prevalence before the pandemic.<sup>13</sup> On the other hand, studies have also indicated that socio-economic factors such as poor economic status and unemployment are also considered crucial in the development of symptoms of mental disorders during COVID-19.<sup>14–16</sup> These conditions are considered to be lower in developed countries when compared to developing ones.<sup>17,18</sup> Lebanon, a developing country in the middle eastern region, is currently suffering from the worst socio-economic crisis related to the mismanagement of the country's resources and political instability and manifested by

inflation, poverty, and a rapid devaluation of the Lebanese currency.<sup>19–22</sup> The pandemic also relentlessly damaged the country's economy due to the strict containment measures imposed by the government to limit the spread of the infection<sup>23–25</sup> which severely affected the health and educational systems. Therefore, a research topic priority in the era of COVID-19 along with its consequences on the mental health became a must, especially at the academic level. Previous research identified a number of potential benefits of universities participating in global research.<sup>26</sup> These benefits include gains in science interest, which will help in building both a better understanding and a better relationship between the public and higher education.<sup>27</sup> In fact, Lebanon's research universities represent some of the most concentrated communities of scholars and collective expertise engaged in educational and research activities. In an incredibly short time after the identification of the coronavirus and with the proliferation of information from a variety of sources that contributed to the spread of panic, Lebanese universities, emerged as the most credible and reliable sources of information as highly qualified personnel can address the pandemic and its economic, political and mental health consequences. The history of education in higher educational universities has been revolutionary in response to new knowledge and opportunities for improvement. Faculties are faced with the need to evolve, in part because current problems demand updates in knowledge and approaches, and in part because of scientific advances and the increased understanding of the determinants of health and their interactions.<sup>28</sup> This upward trend is the result of a deliberate effort exerted by different Lebanese universities to collaborate to research, especially during pandemics. Keeping this fact in mind, the current review was designed to summarize Lebanese universities' contribution to mental health research during the era of COVID-19. Moreover, it also enabled identifying the correlation between authors and journal characteristics and citation score using bibliometric analysis in order to check the institution's outreach and contribution to global research. Consequently, the following research questions were addressed:

1. What are the most commonly used tools to assess the mental health of the patients?
2. What were the different populations which were most psychologically affected by the pandemic?
3. What type of journals were chosen by scholars to publish relevant health-related papers?
4. What type of authorship and contribution were the most prevalent?
5. What are the bibliometric characteristics that may affect citation count of the included studies?

## Methodology

### Selection Criteria

In this scoping review, we searched for peer-reviewed articles describing mental health alterations in the era of COVID-19 within Lebanese institutional settings that are made available online in different libraries as of January 1, 2020. The data set was extracted from the following electronic databases: PubMed, Scopus and Web of Science. All published research in the pre-mentioned years was included in the current study. A bibliometric analysis method was used to describe and compare published works and find a correlation between the citation score, authors, and journal characteristics. For this sake, we adopted the CiteScore as the main technique for citation counts; CiteScore is one of the most utilized metrics systems reflecting the yearly average number of citations to recent articles published in academic journals.<sup>29,30</sup> Scimago Journal rank (SJR) Quartiles (Q) were searched for and described depending on the citation-based metric system.

Included studies assessed all mental health outcomes that were related directly to COVID-19 transmission or occurred concomitantly with the pandemic without any direct relation. Mental health outcomes could be quantitatively or qualitatively measured, and/or derived from a) child, adolescent, and adult, either as a self-report or from caregivers; b) healthcare professionals; c) school or college students, d) teachers or professors, and e) patients with concomitant or without psychological diseases. We approached mental health as broadly as possible, including studies that focused on changes in the symptoms of mental illness, overall mental well-being, mental health service utilization, and other emotional or behavioral characteristics or changes in quality of life.

To do this, search was filtered by one of the following keywords: “Mental” “Psychology”, “Psychiatry”, “Depression”, “Anxiety”, “Quality”, “Satisfaction”, “Stress” and “COVID-19”, “novel coronavirus”, and “nCoV” in

the “subject”, with the idea of knowing how many papers had been published to date. Boolean operators “AND” and “OR” were used to combine search terms where relevant. Grey literature and non-English language articles were not eligible for inclusion. Conference proceedings, letters to editors, abstracts, notes and book series were also removed during screening.

Since the majority of the included studies were observational and heterogenic, it was not possible to conduct a systematic review or meta-analysis. It was instead decided to conduct a narrative scoping review, giving priority to the observational and qualitative studies available and briefly summarizing the salient themes from the other publication types.

## Data Screening and Extraction and Analysis

A data extraction template was created in Microsoft excel to coordinate article screening and remove duplicate entries, erratum and corrections. In a two-stage process, two coders first reviewed article abstracts and then full-text manuscripts for eligibility. They also completed a data extraction template for each article screened for inclusion. This template included fields for: (i) article title, (ii) author names, (iii) author count, (iv) citations count, (v) journal name, (vi) study location, period, design, target population and sample size, measurement tools, and mental health outcomes, and (vii) keywords. Search was continued to include more relevant data such as: (i) quartile of the journal, (ii) authors characteristics such as gender, work status, tenure-track and faculty affiliation and (iii) type of the collaboration whether institutional, national (co-authors do not belong to the same institution but to same region of residence) or international (co-authors do not share the same country of residence). Quality assessment of the included studies was completed according to the Grading of Recommendations, Assessment, Development and Evaluation (GRADE) tool.<sup>31</sup> We graded each potential source of bias as very low, low, intermediate, high, or unclear, according to the respective study design: randomized trials, downgraded or upgraded observational studies, case series/reports (very low). Unclear risk of bias is judged if design and methods were unclear.

## Data Analysis

Main findings from studies were reviewed using narrative methods, characterizing studies based on different psychological outcomes. Results of data extraction were summarized using SPSS version 23 (IBM SPSS Software, Chicago, IL, USA). Analysis using bibliometric data was applied to disclose emerging trends in the included studies and uncover journal performance, collaboration patterns, and research constituents.<sup>32,33</sup>

Continuous measures were summarized by means and standard deviation or by medians and interquartile range where appropriate; categorical measures were summarized by numbers and percentages. Continuity correction chi-square tests were used for the comparison of categorical variables between groups. The conformity of continuous variables to normal distribution was evaluated using visual histogram and probability graphs. Independent-samples *t* test and ANOVA were used for the comparison of data which were normally distributed for the variables.

The relationship between number of citations and other parameters such as authors count, rank, etc. and citation count were evaluated using Pearson’s or Spearman correlation analysis. Correlation coefficients of <0.3, 0.3–0.6, and >0.6 were considered to indicate weak, moderate, and strong correlations, respectively.<sup>34</sup> A *p*-value  $\leq 0.05$  was considered to be statistically significant.

## Patient and Public Involvement

There were no human participants in this review, therefore there was no need to obtain any informed consent.

## Results

### Study Selection

A total of 254 publications that focused on health research were identified through initial searches, out of which 102 studies conducted between 2020 and 2022 focused on mental health research regardless of COVID-19 outbreak. Following screening by title and removing abstracts, 82 papers were included in the full-text review after removing duplicates. Ultimately, 55 studies were found to meet inclusion criteria. The most common reasons for excluding articles after full text review were that some of the articles were redundant works or correction to erratum. A PRISMA flow-diagram is presented in [Figure 1](#) to illustrate the study selection process ([Figure 1](#))

## Study Design and Quality Assessment

As indicated earlier, a total of 55 publications related to the fields of mental health were indexed in Pubmed, Scopus and Web of Science databases between 2020 and 2022. Figure 2 displays the number of publications per year. There was a gradual increase in the number of publications from the year 2020 to 2021 where it reached its highest level (38.2%) to drop again in 2022 to reach 34.5% (Figure 2). The vast majority of the studies that focused on mental health were cross-sectional or qualitative studies (n = 43; 76.7%). Two studies were meta-analyses and longitudinal cohort studies (3.6%), and the others were either literature reviews (10.5%), modeling studies (7%) or case-reports (1.8%). Almost half of these studies discussed the impact of COVID-19 on psychological health in their main objective (49.1%) while others were conducted regardless of the pandemic (50.9%). An adaption of GRADE evaluation was used for primary outcomes of included studies and classified the quality of evidence of interventional studies as high, and observational studies as medium-to-low whereas the quality of evidence of literature reviews was considered very low.

## Study Objectives and Endpoints

The different studies in our review focused on different mental health outcomes that were categorized as follows: changes in behavior and work habits (13/56); changes in existing psychological conditions and their treatment (12/56); general mental health and COVID-19-related fear (11/56), symptoms of depression and cognitive impairment (8/56 studies); anxiety and suicidal ideation (3/56); life or work satisfaction (4/56), stress level (2/56), and quality of life impact (2/56). Contextual factors such as pandemic control measures; social connection; family relationships; technology use and media consumption; and additional work resilience were the also endpoints of the included studies.

A variety of standardized tools were used across studies to assess mental and psychological health outcomes. The most commonly used tools included the Generalized Anxiety Disorder Scale (7/56), the Patient Health Questionnaire (5/56), and Trait Emotional Intelligence Score. Other scores were used such as 3D-Work Fatigue Inventory, Beck Depression Inventory, Hospital Anxiety and Depression scale, Liebowitz Self-scoring Scale Fear, Rosenberg Self-esteem Scale, Perceived Stress Scale, Hamilton Anxiety Rating Scale and Hamilton Depression Rating Scale. The majority of the studies focused entirely on the general adult populations >18 years of age (n = 24; 42.1%) whereas 5 studies focused on adolescents and children (9.1%). More details about population sub-groups distribution are found in Figure 3.

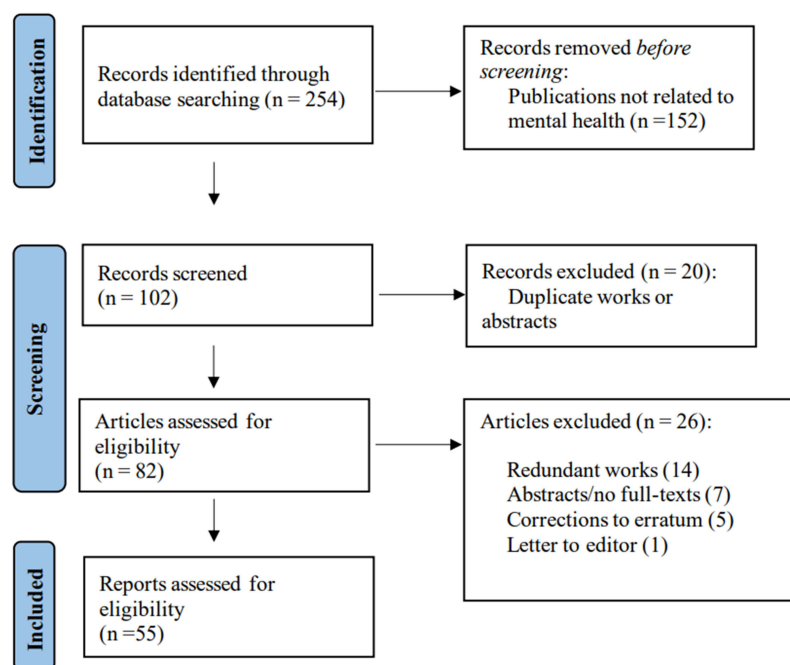
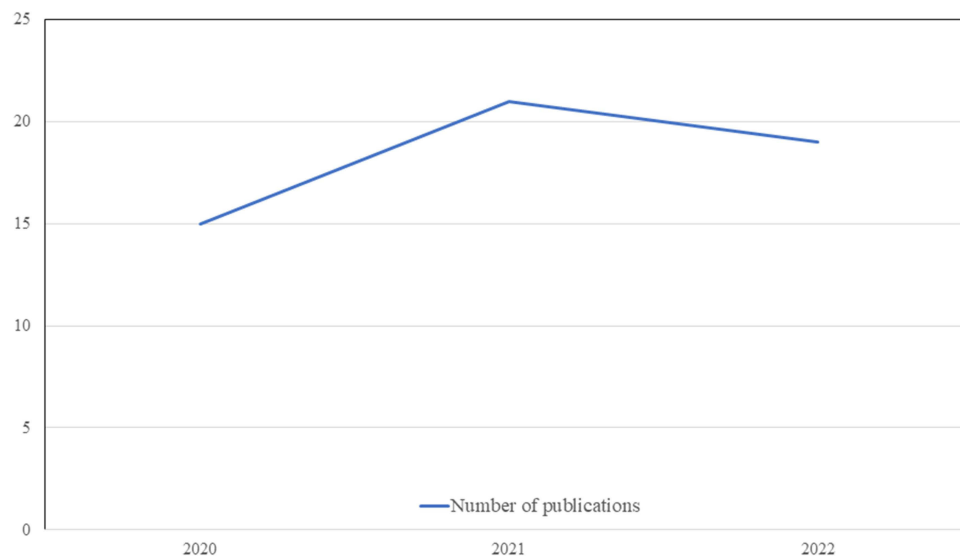
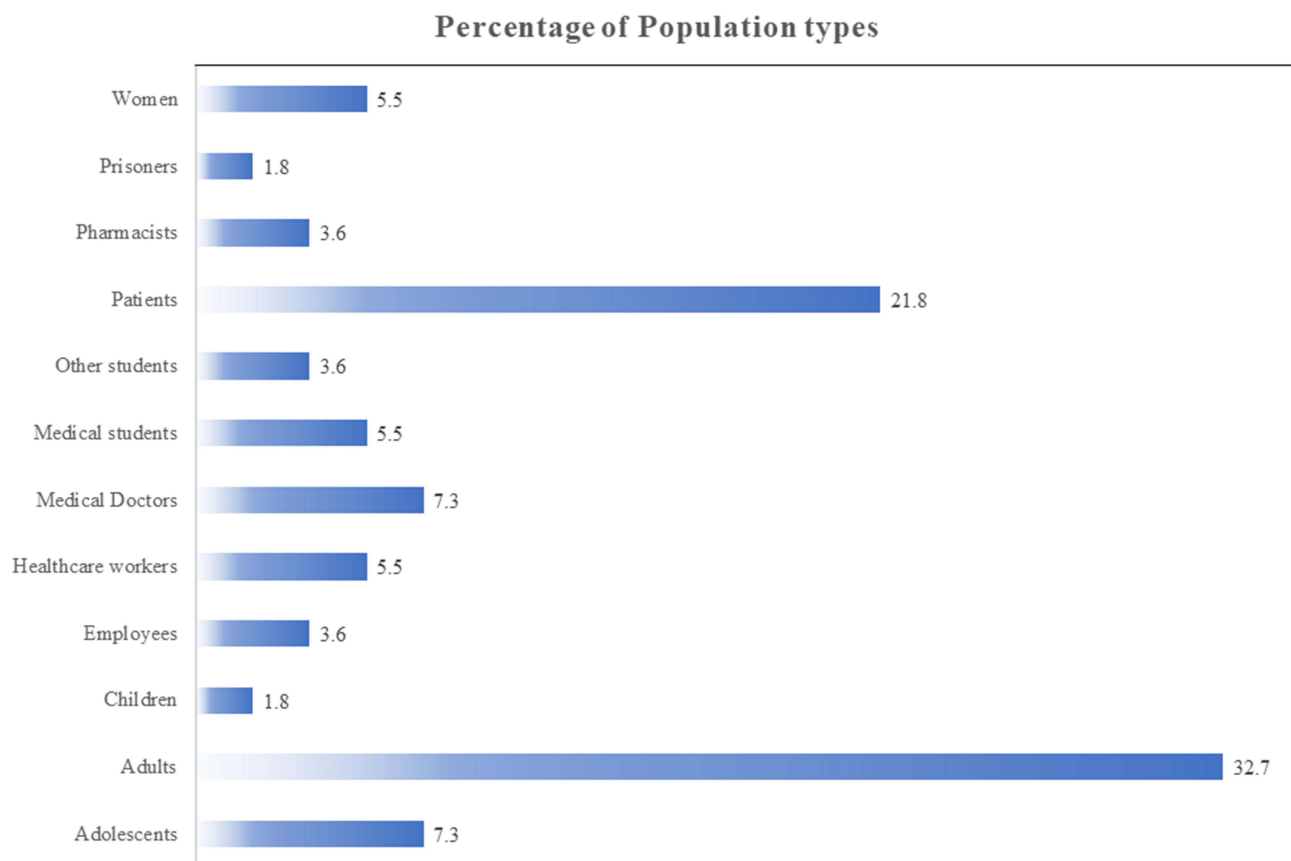


Figure 1 PRISMA Flow diagram of studies selection process.



**Figure 2** Number of mental health publications per year.



**Figure 3** The different populations and their percentages.

## Study Population

### Literature Addressing the Mental Health Impact on the General Adult Population

Eighteen publications, including literature reviews and modeling studies addressed the mental health status of the general population, based on literature from previous disease outbreaks or specified theoretical models. Some of these

highlighted the role of COVID-19 unpredictability, seriousness of the disease, misinformation and social isolation in contributing to stress and mental morbidity.<sup>35–38</sup> Other authors highlighted the need for mental health services and the strengthening of social capital to reduce the adverse psychological impact of the outbreak. They focused on the validation of different stress and anxiety scales in order to measure the level of psychological distress among the general population and correlate them with different socio-demographic factors aggravating their mental distress.<sup>39–47</sup> More research has examined the role of media coverage of diseases in influencing people's health behavior, particularly their compliance with prevention measures through online consultations.<sup>48,49</sup> It was proven that increased media exposure to COVID-19 news positively relates to people's abidance by prevention measures and that perceived knowledge and fear mediate this relationship.<sup>50</sup> Another study emphasized the economic impact of COVID-19 and its impact environmental moral obligation as well as stress level and willingness to make economic sacrifices for environmental protection.<sup>51</sup> Moreover, few studies have discussed the impact of COVID-19 on employees' psychological health and aimed at exploring the relationship between organizational learning and work engagement amid the COVID-19 pandemic through testing the mediating role of employee resilience and psychological empowerment on this relationship.<sup>52</sup> Moreover, other studies assessed the negative perceptions of both the disease and the vaccine among employees and found that there is a positive relationship between ethical leadership, commitment, and safety influencing employees to accept COVID-19 vaccination.<sup>53</sup>

### Literature Addressing the Mental Health Impact on the Vulnerable Population

Twenty-two publications identified particular population who are more vulnerable to the mental health impact of the COVID-19 pandemic. These vulnerable groups include patients with pre-existing medical conditions, women, prisoners, and students. Of particular interest to practicing psychiatrists are the six studies regarding COVID-19 and patients with pre-existing mental illness such as depression,<sup>54,55</sup> schizophrenia,<sup>56,57</sup> and Alzheimer.<sup>58,59</sup> Conversely, patients with pre-existing mental disorders may be at higher risk of mental distress due to the stress associated with the COVID-19 outbreak. Moreover, patients suffering from anorexia nervosa and drunkorexia tend to have more psychological problems (depression, anxiety, and stress) associated with more pronounced inappropriate eating habits.<sup>60,61</sup> As for the prisoners, final results suggested a significant correlation between insecure attachment and lower mentalizing capacities.<sup>62,63</sup>

In regard to the patients suffering from other pathological conditions, research findings raised concerns regarding the psychological health in patients diagnosed with cancer,<sup>64</sup> HIV,<sup>65</sup> or renal insufficiency.<sup>65</sup> It was crucial to implement psychological health screening for those patients to help prevent emerging psychological health problems.

The relationship between COVID-19 – related stress and anxiety faced by the general<sup>66,67</sup> or medical students<sup>68–70</sup> was the main objective of many research studies. It was shown that mental health support is a must and needs to be provided to many college students during extended periods of enforced home learning and curfew to avoid deterioration of their quality of life. To add, some studies discussed the prevalence of domestic violence against women while demonstrating its further emergence during quarantine. They focused on the effects brought on by lockdown policies, including social and economic factors, and their implications in the increase of violence against women and fatality rates during this pandemic.<sup>71–73</sup>

### Literature Addressing the Mental Health Impact on Younger Population

Although most of the studied population were adults, few papers have discussed the mental health impact of COVID-19 from the point of view of adolescents and younger population.<sup>74,75</sup> During an outbreak of infectious disease, particularly in the presence of inaccurate or exaggerated information from the media, health anxiety and quality of life deterioration can become excessive for this type of population. Relative studies results revealed that insecure attachment styles are associated with higher levels of depression, suicidal ideation, and social phobia.<sup>76–78</sup>

### Literature Addressing the Mental Health Impact on Healthcare Workers

Healthcare workers are at a significant risk of adverse psychological outcomes during the COVID-19 outbreak. Reasons for this include increased vulnerability to infections, long working hours, loneliness, and physical fatigue.<sup>79–81</sup> Out of all the research studies included, nine papers have addressed this topic. Some of these clearly illustrate that the perceived high risk of contracting COVID-19 would be the most significant predictor of depression. Moreover, work fatigue within physicians seems to be associated with higher level of everyday stress, high work load and depression.<sup>82,83</sup> Furthermore, there was



a necessity for nursing stakeholders to introduce programs to regularly assess and enhance the resilience of nurses especially at time of crisis. Such programs would protect nurses from the perils of burnout and enhance their retention during times when they are most needed.<sup>84,85</sup> As for the pharmacists, most of the respondents were concerned about getting infected and their families due to their professional exposure which increased the level of stress among most of them.<sup>86,87</sup>

### Authors Characteristics and Collaborations

Most of the studies had multiple authorship. Only five (8.8%) were written by two authors and one study was single-authored. Female primary authors were more than males (51.6% versus 48.4%). Twenty-seven LAU authors who contributed to mental health research studies were associate professors (49.1%), 23 were assistant professors (42.1%) with full-time positions (84.2%) and on tenure-track (82.5%) and the rest were either lecturers, researchers or students. Heterogeneity of authors' specialties was seen in most of the publications with multiple authorships. Most of the publications belonged to the faculty of Natural Sciences and Psychology (n = 28; 49.2%) followed by the school of medicine (n = 11; 19.3%) then the school of Pharmacy and (n = 6; 10.5%). Fifty-four of the authors' collaborations were identified to be national (52.6%), followed by 23 international collaborations (40.4%). The median number of publications per author was estimated to be 17.01 ± 38.0 [0–1012]. More details on authors' characteristics are summarized in Table 1.

### Journals Characteristics and Citation Count

As detailed in Table 1, publications authored by all scholars appeared in a total of 44 different peer-reviewed journals. The majority of the publications were published in SJR Q1 journals (57.1%), while 15 studies belonged to Q2 journals (26.8%). Eight publications were submitted to journals of lower SJR rank.

The impact of publications that were authored by the scholars was analyzed by checking the “Times cited” and the “CiteScore” field that is available in the Scopus database. Our findings conclude that 44.6% of the publications received

**Table 1** Characteristics of the Included Publications

Variable	Number	Valid Percentage (%)	Cumulative Percent (%)
Publication Year			
2020	15	27.3	27.3
2021	21	38.2	65.5
2022	19	34.5	100.0
Faculty			
Business and Management Studies	5	9.1	9.1
Engineering and architecture	1	14.1.83	10.9
Medicine	12	21.8	32.7
Natural Sciences	8	14.5	47.3
Nursing	5	9.1	56.4
Pharmacy	6	10.9	67.3
Psychology and Liberal Education	18	32.7	100.0
Authors Collaboration			
Institutional	23	41.8	41.8
Local	3	5.5	47.3
National	29	52.7	100.0

(Continued)

**Table 1** (Continued).

Variable	Number	Valid Percentage (%)	Cumulative Percent (%)
Study Type			
Cross-sectional	44	80.0	80.0
Literature review	5	9.1	89.1
Longitudinal Cohort	1	1.8	90.2
Meta-analysis and systematic review	1	1.8	92.7
Modeling	5	7.3	100.0
Journal papers per quartile			
Q1	31	57.4	57.4
Q2	15	27.8	85.2
Q3	4	7.4	92.6
Q4	4	7.4	100.0
Authors numbers			
≤ 3 authors	20	36.4	36.4
>3 authors	35	63.6	100.0
Rank			
Associate Professor	97	30.4	30.4
Assistant Professor	82	25.7	56.1
Professor/Instructor	26	8.1	64.2
Unknown	114	35.7	100.0

no citations. The rest (55.4%) were cited at least once. The most frequently cited publication was cited 125 times. Thirteen publications were cited at least received seven times. The citation count of all publications was 419 and the average number of citations per publication was  $15.3 \pm 30.13$  [0–125]. More details on the number of citations according to different publications are presented in [Table 2](#).

**Table 2** Details of Citations Number

Number of Citations	Number	Percentage (%)	Cumulative Percent (%)
1.0	4	13.3	13.3
2.0	7	23.3	36.7
3.0	2	6.7	43.3
4.0	1	3.3	46.7
5.0	1	3.3	50.0
6.0	2	6.7	56.7

(Continued)



**Table 2** (Continued).

Number of Citations	Number	Percentage (%)	Cumulative Percent (%)
7.0	3	10.0	66.7
9.0	2	6.7	73.3
10.0	1	3.3	76.7
11.0	1	3.3	80.0
21.0	1	3.3	83.3
24.0	1	3.3	86.7
31.0	1	3.3	90.0
50.0	1	3.3	93.3
117.0	1	3.3	96.7
125.0	1	3.3	100.0
Average number of publications	15.7±30.52		

### Association Between Publications Characteristics and Citation Rate

Our analysis has shown that no correlation exists between the number of contributing authors and the citations count ( $r = 0.093$ ;  $p = 0.62$ ). On the other side, the number of citations was higher in papers with international collaboration of authors when compared to institutional or national ones ( $p = 0.031$ ). Moreover, citations count was higher in publications written by associate professors when compared to others. In fact, the mean citation count was found to be  $24.52 \pm 38.62$  in publications written by associate professors versus  $4.3 \pm 3.44$  in those written by their peers of lower rank ( $p = 0.047$ ). The same finding was also found when comparing publications that were related to COVID-19 versus those not related. Publications with COVID-19 as main objective were more cited than papers with no direct relation to this subject ( $25.9 \pm 39.45$  vs  $4.14 \pm 3.2$ ;  $p = 0.044$ ). To add, the number of citations was also correlated with the quartile of the journal. In fact, studies that were published in journals with higher quartile ranks (Q1 and Q2) were more cited than other studies (Q3 and Q4) (Mean count  $16.75 \pm 31.40$  vs  $2.00 \pm 1.41$ ;  $p = 0.021$ ). The detailed results on the association between citations count and other bibliometric characteristics are summarized in [Table 3](#).

**Table 3** Correlation Between Number of Citations and Other Bibliometric Variables

Variable		Average Citation Number	Standard Error	Pearson Correlation ( $r^2$ ) p-value	p-value
Authors count	<3	15.08	10.04	-	0.92
	≥3	16.22	16.69		
Author's Rank	Associate	4.31	0.95	-	0.047
	Other	24.53	9.36		
Authors' Collaboration	International	24.56	9.93	-	0.031
	Local	5.71	7.37		

(Continued)

Table 3 (Continued).

Variable		Average Citation Number	Standard Error	Pearson Correlation ( $r^2$ ) p-value	p-value
Journal CiteScore				0.625	<0.005
Related to COVID-19*	Yes	25.93	9.86	-	<0.044
	No	3.21	0.85		
Journal SJR <sup>§</sup>	Q1 or Q2	16.75	5.93	-	0.021
	Q3 or Q4	2.00	1.00		
Department	Business	4.75	2.05	-	0.85
	Engineering	2.00			
	Medicine	7.75	4.61		
	Natural Sciences	42.5	24.85		
	Nursing	13.33	8.95		
	Pharmacy	10.2	6.62		
	Psychology	15.7	5.57		

Note: \*COVID-19: Coronavirus Disease-19.

Abbreviation: <sup>§</sup>SJR, Scimago Journal Rank.

## Discussion

We reviewed fifty-five studies that focused on mental health deterioration and were considered part of Lebanese universities' contribution to research in the era of COVID-19. It was clearly shown that mental health was largely studied in the early stages of the pandemic then the approach decreased later, despite the continuation of the severe socioeconomic crisis in Lebanon. This finding is of importance since it was essential to study the psychological burden imposed by COVID-19 in order to seek clinical updates and find solutions for this fast-growing pandemic. This pattern of results may represent an acute and normal response to an unforeseen and distressing traumatic event which was then followed by a period of psychological adaptation and resilience.<sup>88</sup> Similar to concerns raised early in previous publications regarding different types of health studies,<sup>8</sup> changes in existing mental health may be in part explained by imposed restrictions that provided a more structured daily routine and increased exposure to external stressors.<sup>89</sup> However, there was some heterogeneity observed for the change in mental health during the pandemic. Our review showed that worsening of mental health symptoms was most common in studies examining depression and mood disorders symptoms whereas the number of studies that assessed the change in anxiety symptoms was smaller. Again, the more pronounced change in depressive symptoms may be reflective of the effects of isolation and social restrictions and loss of social life during the pandemic.<sup>90</sup>

Increases in mental health problems were observed across most population sub-groups (eg general population, university students, healthcare workers, etc.) even in vulnerable population such as prisoners and patients with pre-existing disease condition.<sup>91</sup> Moreover, many studies have shown that mental health and wellbeing levels seemed to deteriorate in younger age groups – while adolescents and young adults are at greater risk of poorer mental health regardless of pandemic conditions.<sup>92</sup> Another important subgroup that was affected by the pandemic was the patients with pre-existing mental health problems. The same finding was highlighted by a previous study conducted earlier in 2020, where Galletly C. stated that the pandemic would be a difficult time for people with chronic mental illness.<sup>93</sup> Moreover, in his newly released press article, Dannaoui has underlined the fact that the prevailing situation in Lebanon is significantly impacting the psychological well-being of various groups, including adults, adolescents, and especially individuals with specific needs and their caregivers. The combination of civil unrest, economic crisis, and the ongoing

COVID-19 pandemic has created increasingly challenging conditions for the residents of Lebanon.<sup>94</sup> However, the lack of studies reporting pre-COVID comparative data makes it difficult to determine the extent to which mental health declined for this type of patients when compared to those with no pre-existing mental health problems.

From the research productivity point of view, our results showed that researchers who addressed mental health deterioration in the era of COVID-19 research were mainly associate professors regardless of their affiliation or specialty. This is in line with the findings of Aksnes DW. et al suggesting that faculty with a higher academic position tend to be more interested in publishing, especially in emergency situations where the chance of having more publications/citations increases even more.<sup>95</sup> More broadly, the emphasis on peer reviewed publication as a key criterion of academic success encourages academics to prioritize research. Moreover, it was noted that most of the work related to mental health research during COVID-19 pandemic have been published in Q1 and Q2 journals. In addition, there was a statistically significant correlation between the journal SJR Q and the publication citation rate. This is important in an academic environment because of the impact these journals have on one's academic career such as on contract renewal, promotion and tenure. Having said that, most of researchers are usually eager to publish in highly reputable journals to promote their social and professional desirability.<sup>96</sup>

Moreover, a positive association was shown between citation count and international authors' collaboration. This is consistent with other prior publications, confirming that research collaboration adds benefits for both the researchers and the organizations and enhances the quality of research resulting in higher numbers of scholarly output.<sup>97</sup> To add, a significant positive association was demonstrated between the publications' citation count and their relation to COVID-19. In fact, many international studies described the association between COVID-19 and worsening psychological symptoms, which may have played a major role in increasing the citation count of studies related specifically to COVID-19.<sup>98,99</sup> Unsurprisingly, several seminal COVID-19 publications have been cited at incredibly high rates as researchers have turned to these papers to help guide their next steps.<sup>100,101</sup> For example, the results of the study conducted by Brandt MD. et al concluded that COVID-19 articles published between January 1, 2020 and December 31, 2021 are being cited at considerably higher rates than the non-COVID-19 papers.<sup>102</sup> Reasons behind the major increase in citations for COVID-19 articles are clear. In fact, this outbreak has dominated global focus since its onset in 2020, affecting over 200 countries across the world.<sup>103</sup> As such, researchers are eager to add their contributions to what can be done to combat this disease and, to do this, are citing earlier works to support their approaches.

The impact of COVID-19 on mental health was mainly assessed in observational and qualitative studies with a moderate to low GRADE quality of evidence. This was consistent with our expectations since this type of studies is usually more convenient despite having a lower level of evidence when compared to interventional studies.<sup>104</sup> However, a conclusion about the exact association between COVID-19 and worsening psychological symptoms seems to be difficult because of the scarcity of robust longitudinal cohort studies. To add, the number of publications relating the deterioration of mental health due to COVID-19 were not abundant, which could be due to the lack of funding for such types of research in low-income countries such as Lebanon where the health system suffers severely.<sup>105</sup> For these reasons, there would a necessity to think of more experimental human studies since these are known to be more relevant with more generalizable results.

## Strengths and Limitations

To our knowledge, our review is among very few studies that have addressed the different mental health research fields that continued in the era of COVID-19. One of the strengths of this review is that we aimed at selecting studies that were conducted not only during the early stages of the pandemic but one year later. Given that there have been second waves of the pandemic in many countries, it was important to continue to monitor the impact of COVID-19 on mental health over the following years. However, few limitations are to be acknowledged. First, this review only provides a snapshot of the research available during the period when the existing literature was searched and it is possible that some published information has been missed. Although they are quite representative to date, it should be noted that other mental health-related studies might have been published during the time of the redaction of this review but were not included. Second, given the heterogeneity of studies included, it was difficult to conduct a meta-analysis that summarizes the overall findings in a quantitative manner. One key gap is the lack of longitudinal studies with comparative pre-COVID data.

Consequently, conclusions about how mental health changed over the course of the pandemic and how people adapted during COVID, are currently limited. Third, the review does not provide detailed data on prevalence rates and statistical associations for each study as many of them did not provide this information. Therefore, it would be helpful to conduct future systematic reviews to make it challenging to combine the data to obtain comparative estimates in order to reflect a better impact of COVID-19 on psychological health and improve the country's responsiveness to comprehensively study future challenges.

## **Future Recommendations**

### **Recommendations Regarding Education**

The characteristics of a successful professional institution should be adequate to the requirements of the social situation. In this regard, university education should attain a crucial role in developing research-centered training, especially in the era of pandemics. Several initiatives were launched to communicate accurate scientific information to the public. For instance, medical and nursing students focused on mental health provision, such as online cognitive behavioral therapy for monitoring of deterioration of psychological symptoms and several blogs and podcasts were launched to explain different aspects of the pandemic. More specifically, schools of public health need to embrace more flexible modes of program delivery, e-learning, distance learning and life-long learning. Such developments are crucial to train the public health workforce that is needed in both the developed and the developing world.

### **Recommendations Regarding Research**

Besides education, other challenges need to be addressed. These include the safety of the community, the financial sustainability, and the internationalization strategy with the government. Perhaps most importantly, universities must provide basic and applied research as well as direct medical assistance. They must also disseminate scientifically correct content and participate in campaigns to ensure that the population obtains timely and accurate information. Higher education institutions have a duty to pursue their research activities, despite the restrictions that the current situation imposes.

### **Public Health Recommendations**

In addition to the previously mentioned recommendations, a national action plan is required to manage poor mental health. Given the pervasiveness of economic impacts due to the pandemic, a focus on national prevention interventions that targets social determinants of health such as food security, safe housing and access to education is also warranted. Moreover, research studies with longitudinal designs and with defined comparison groups are needed to investigate possible risk factors and other long-term mental health impacts on people's mental health.

## **Conclusion**

With all the negativity surrounding COVID-19 outbreak, it is good to know that local universities are stepping up to give insights on existing social problems and provide valuable guidance for the establishment of protocols and procedures for fighting future pandemics. In this review, we summarized different contributions about various mental health research studies that took place during COVID-19 outbreak in a politically unstable environment. However, researchers should always be keen to defend an environment conducive to mental health research that is always beneficial for the population. In this way, research continues to advance and the cycle is perpetuated.

## **Data Sharing Statement**

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

## **Disclosure**

The authors declare that they have no competing interests.

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