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Review Article

Mental Health Issue of Health Care Professionals During COVID-19 Pandemic: A Rapid Review

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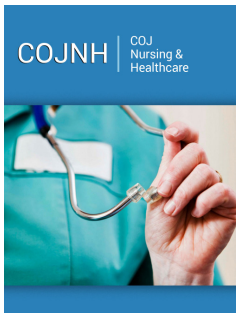

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Abstract

Aim and objectives: To estimate the mental health status of health care professionals during COVID-19 pandemic.

Background: During this COVID-19 pandemic, health professionals face mental health challenges including stress, anxiety and depression, and insomnia. The mental health issues could be due to COVID-19 cases in the community and in hospitals.

Methods: A meta-analysis was done on the mental health status of health professionals during the COVID-19 pandemic globally. The English and Chinese database were searched for the purpose of this review and the data bases included PubMed, PubMed Central, Web of Science from the Cochrane Library, and China National Knowledge Infrastructure. The review included 26 studies published from February 18 to April 28, 2020. Inclusion criteria and exclusion criteria were set before screening the data base.

Result: The prevalence of stress among health professionals was 31.3%, depression 25.2%, anxiety 28.5% and insomnia was 45.5% in Wuhan, Hubei province of China. However, the prevalence of stress was 53.1%, depression was 34.0% anxiety 33.0% and insomnia was 14.1% in other parts of China. The prevalence of insomnia among health workers was higher in Hubei province compared to other provinces, 45.5% and 33.5% respectively Health professionals with psychological distress or severe mental health issues were reported higher in Hubei province (24.5%) compared with other provinces in China (14.1%). This meta-analysis shows that there is high incidence of mental health issues in the areas affected by COVID-19 compared to the other provinces.

Conclusion: Currently there is very little attention provided to mental health issues in the general population and to the health professionals in the COVID-19 affected areas. There is an urgent need to implement mental health issues interventions in countries affected by COVID-19.

Keywords: Coronavirus 2019; COVID-19; Mental health; Stress; Health professionals

Introduction

COVID-19 was first noticed in Wuhan, Hubei Province in China in December 2019 before it became a pandemic. The World Health Organization (WHO) announced the outbreak of a new coronavirus disease, COVID-19, as a Public Health Emergency of International Concern (PHEIC) in January 2020 [1]. COVID-19 is a highly contagious disease and it leads to severe pneumonia, acute respiratory distress syndrome, and mortality in some cases. Higher morbidity and mortality rate is reported in some high-risk groups such as the elderly and especially those co-morbidity [2,3]. Previous experience from Severe Acute Respiratory Syndrome (SARS) and Middle Eastern Respiratory Syndrome (MERS) showed that the emerging infectious disease outbreaks always had a psychological impact on generally population and health care professionals. The rapid transmission and uncertainty of the prognosis of COVID-19 resulted in different levels of mental health issues among the general population [4-6].

The Personal Protective Equipment (PPE), intensive care unit beds, and ventilators may not be able to meet the increasing number of COVID-19 cases [2,7] and this may cause mental distress among the health professionals and also in the community. During this COVID-19 pandemic, frontline health professionals face challenges including stress both physical and psychological. The mental health issues could be due to health professionals exposed to suspected and confirmed cases. Some overworked health professionals experience stigma or

even fear from their families and the community. These situations has resulted in several publications on mental health issues among the general population as well among health professionals during this COVID-19 pandemic worldwide [8-13]. The objective of this study is to assess the mental health issues related to the COVID-19 pandemic among health care professionals using a Meta-analysis. Hopefully an evidence-based intervention strategy may be developed to maintain mental wellbeing among health professionals during this pandemic.

Methods and Materials

A meta -analysis was done using published papers from PubMed, PubMed Central, Web of Science, the Cochrane Library, Google Scholar, and China National Knowledge Infrastructure from January 2020 through May 2020. The search languages used were English and Chinese and the keywords used included coronavirus disease 2019, COVID-19, novel coronavirus pneumonia, mental health, depression, anxiety, insomnia, psychological distress, stress, medical staff, health care workers, and health professionals. The eligible articles were imported into Endnote to avoid any duplication. Meta-analysis was performed in evaluating the pooled effect size of depression and anxiety status because of limited amount of data available.

Owing to the rapid and widespread of COVID-19 worldwide, a rapid review approach was used to obtain information of this highly transmissible disease [14]. Dual review of 25% of abstracts was done and STROBE was not used for the quality control of the studies that were selected and data abstraction was conducted by a single reviewer [15].

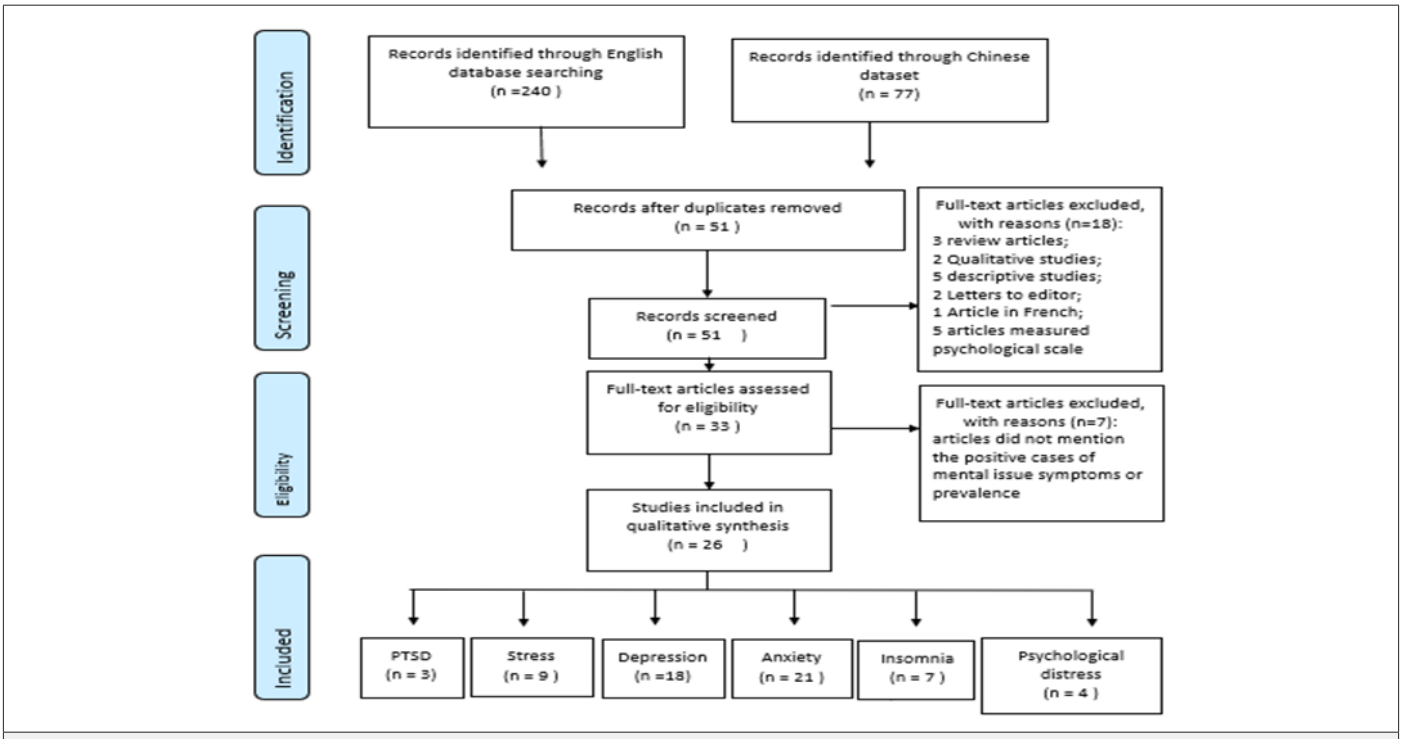

Figure 1: Flow diagram of article selection.

Figure 1 shows the process of how the papers were selected for the study. A total of 317 papers were identified initially but only 26 papers were reviewed finally. All the studies were selected using pre-defined inclusion and exclusion criteria. Table 1 shows the list of full text of articles assessed for eligibility. Only the cross-sectional, cohort and case-control study designs were included. Descriptive and narrative study designs, protocols and letters to the editor were excluded. Study population included health professional including medical doctors, nurses, and medical technicians who were currently working in the hospitals or in other health settings. Data extraction was done using a Microsoft Excel table and the main areas studied included the prevalence of mental health issues, including Post-Traumatic Stress Disorder (PTSD), stress, depression, anxiety, insomnia, and psychological distress or severe mental disease in general.

The risk for bias assessment was not conducted in this rapid review. However, we noticed the key limitations of each article, and paid close attention when we drew the conclusion. Publication bias were checked by Begg's rank method and funnel plot using R version 3.6.1. P-value>0.05 indicates no significant publication bias [16].

Random effect method heterogeneity test was analyzed to estimate the research with the prevalence of each of the psychiatric symptom in health professionals as study outcomes. The results showed the existence of heterogeneity among the articles being chosen. The probable factors may be due to geographic variation and therefore a subgroup analysis was performed.

Result

Most of the studies were cross-sectional except for one article from Mei et al. [17], which was a case-control study. Of the final 26 studies, 3 studies had interpreted the prevalence of post-traumatic stress disorder (PTSD) among medical workers; 9 studies depicted the prevalence of stress in health professionals; 18 studies

presented the prevalence of depression status in medical workers; 21 studies investigated the prevalence of anxiety among medical staff; 7 studies have showed the prevalence of insomnia in medical staff; and 4 studies demonstrated the prevalence of psychological distress or severe mental disease in medical staff.

Table 1: Summary of Studies Included in the Review.

	Author	Date	Population (locality)	Sample	Instruments	Mean(age)	n(Male/female)
1	Qi et al. [1]	Feb-28	Nurses/ (Henan, China)	400	UCLA-LS, SAS, SDS	Unknown	105/295
2	Deng et al. [2]	Mar-03	Nurses and doctors (Sichuan, China)	60	Stress-related questions associated with H1N1 event	32.15±7.89	Aug-52
3	Wang et al. [3]	Mar-05	Frontline medical staff (Wuhan, China)	112	SCL-90	34.3±6.09	26/186
4	Chen, Sun, Hu [4]	March	Residents (Zhejiang, China)	711	PHQ-9, GAD-7	Unknown	315/396
5	Li, Xiong, Liu, Zong, Li [5]	Mar-20	Frontline nurses (Wuhan, China)	66	Self-developed Questionnaire and HAMA	Unknown	15/51
6	Liu et al. [6]	Mar-27	Nurses (Beijing, China)	1097	PHQ-9, GAD-7, ISI, SRQ-20	29±5.88	19/1078
7	Sun, Huang, Wang [7]	Mar-30	Nurses (Shanghai, China)	110	SCL-90, PSSS	Unknown	8/102
8	Xu, Zhao, Tang [8]	April	Medical Staff (Anhui, China)	534	SAS, SDS, SCSQ	34.79±7.14	167/367
9	Luo et al. [9]	Apr-17	Medical Staff (Guangzhou, China)	171	GAD-7, PHQ-9, PSS-10	Unknown	41/130
10	Li Z et al. [10]	Apr-28	Medical Staff (not mentioned)	304	K6	37.12±9.79	94/210
11	Qin, Wang, Li, He, Zhan [11]	Apr-29	Psychiatric Medical Staff (not Mentioned)	74	Self-designed questionnaire	Unknown	16/58
12	Tang et al. [12]	Unknown	Frontline Nurses (Wuhan, China)	44	SAS, SDS, PSS-10	33.5±6.39	Oct-34
13	Wei, Shi, Cao [13]	Unknown	Primary medical staff (Shanghai, China)	2150	PHQ-9, GAD-7, PSQI	Unknown	873/1277
14	Zhong, Song, Li, Luo, Chen [14]	March	Medical staff (Guiyang, China)	136	GAD-7, CD-RISC, PSS-10	30.69±6.21	19/117
15	Wang Y et al. [15]	Mar-17	Medical staff (Hubei, China)	385	SCL-90	37.07±6.76	191/194
16	Lu, Wang, Lin, Li [16]	Apr-04	Medical staff and administrative staff (Fujiang, China)	2299	NRS, HAMA, HAMD	Unknown	514/1785
17	Tan et al. [17]	Apr-06	Medical staff and hospital administrative staff (Singapore)	470	DASS-21, IES-R	*31(28-36)	149/321
18*	Zhang et al. [18]	Apr-04	Medical staff and college students (All over China)	1563	PHQ-9, GAD		270/1293
19	Jiang [19]	April	Frontline medical staff (Hunan, China)	534	Self-designed questionnaire	36.4±16.18	167/367
20	Chen Y, Zhou, Zhou, Zhou [20]	Apr-16	Pediatric medical staff (Guiyang, China)	105	SAS, SDS	32.6±6.5	Oct-95
21	Dai, Hu, Xiong, Qiu [21]	No-Peer Review	Medical staff (Hubei, China)	4357	GHQ-12		1026/3331
22	Liu S et al. [22]	Feb-18	Frontline medical staff (all over China)	1563	ISI, PHQ-9, GAD		270/1293
23	Liu CY et al. [23]	Mar-08	Medical staff (China)	512	SAS		79/433
24	Lai et al. [24]	Mar-23	Medical staff (China)	1257	PHQ-9; GAD-7, ISI, IES-R		293/964
25	Cai et al. [25]	Apr-03	Medical staff (Jiangsu, China)	1521	SCL-90		372/1149
26	Zhang W et al. [26]	Apr-04	Medical staff & General population (all over China)	925	ISI, PHQ-4, PHQ-2, SCL-90-R		247/678
27	Chew et al. [27]	Apr-18	Medical staff (Singapore, India)	906	DASS-21, IES-R		321/583
28	Huang, Han, Luo, Zhou [28]	Mar-04	Medical staff	230	SAS, PTSD-SS		43/187

29	Kang et al. [29]	Mar-28	Medical staff (Wuhan, China)	994	PHQ-9, GAD-7, ISI, IESR		
30	Zhu et al. [30]	Feb-23	Medical staff (Wuhan, China)	5062	PHQ-9, GAD-7, IES-R		759/4303
31	Ying et al. [31]	No-peer review	Family members of health workers (Ningbo, China)	822	PHQ-9, GAD-7		
32	Jing Qi et al. [32]	Mar-17	Medical staff (Hubei, China)	1306	PSQI, AIS, VAS	33.1±8.4	256/1050
33	Cao et al. [33]	Mar-30	Medical staff (Beijing, China)	37	PHQ-9, Maslach Burn-out Inventory (MBI)		

The overall prevalence of mental health issues by symptoms

After the meta-analysis was done the prevalence of Post-Traumatic Stress Disorder (PTSD) was 12.8% (95% CI: 0.048-0.238), stress was 36.3% (95% CI: 0.176-0.573), (Figure 2) depression was 29.4% (95% CI: 0.211-0.385), (Figure 3) anxiety was 30.5% (95% CI: 0.253-0.358), (Figure 4) insomnia or sleep disturbance was 35.2% (95% CI: 0.302-0.403), (Figure 5) and psychological distress or severe mental health was 19.1% (95%CI: 0.065-0.3622).

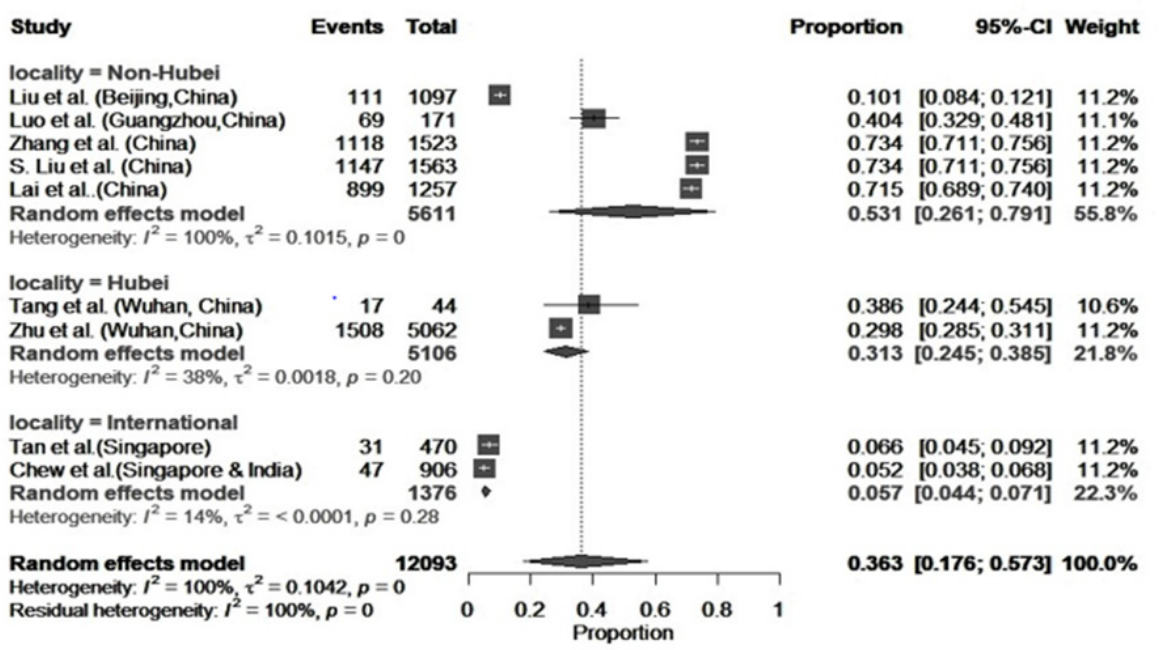

Figure 2: Meta-analysis on stress among health care professionals during COVID-19.

Subgroup analysis and sensitivity analysis

A subgroup analysis was done to determine the heterogeneity among the studies, and whether they were comparable. Figure 2 shows the subgroup analysis of stress of three geographic categories: Hubei; other provinces in China and outside China, the I2 statistic indicated that the percentage of variation across was due to heterogeneity rather than by chance [18]. Meta-analysis on the prevalence of stress among health professionals, from two studies from Hubei province indicated homogeneity [19,20].

The prevalence of stress among health professionals in Hubei province was 31.3% (95% CI: 0.245=0.386) and prevalence in other provinces in China the was much higher (53.07%, 95% CI: 0.261-0.792). Similarly, the prevalence of depression reported on health professionals in other provinces of China was 34.0%, (95% CI: 0.244-0.443), and this was higher than in Hubei which was 25.20%, (95% CI: 0.134-0.388), The prevalence of anxiety among health workers in Hubei province was: 28.5%, (95% CI: 0.221-0.354) and this was higher than in other provinces 33.0%. (95% CI: 0.268-0.395. The prevalence of insomnia among medical workers was higher in Hubei province compared to other provinces, 45.5% and 33.5% respectively (Figure 5). Health professionals with psychological distress or severe mental health issues were reported higher in Hubei province (24.5%) compared with other provinces in China (14.1%).

Discussion

The most common mental health problems during this COVID-19 pandemic in Hubei province in China were insomnia (45.5%), stress (31.3%) and anxiety (28.5%). However, in other parts of China insomnia was lower (33.5%), stress and anxiety were higher (53.0%) and (33%) respectively. The prevalence of stress in Hubei province was consistent with SARS pandemic in 2003 which was 35% among doctors and 25% among nurses [21]. The prevalence

of stress, depression and anxiety were lower in Hubei Province compared to other provinces in China, and this heterogeneity may be due to geographic variation rather than occupational variation. It could be explained 'Psychological Typhoon Eye Effect' [22], that people in the epicentre seem to be more calm and have less post-traumatic concern about their safety and health, compared to other parts of the country. Similar results was also found on the psychological status during the SARS outbreak in 2003 [23]. Although our study focussed on health professionals, the results of our study are consistent with a study among different populations in China during COVID-19 outbreak [24].

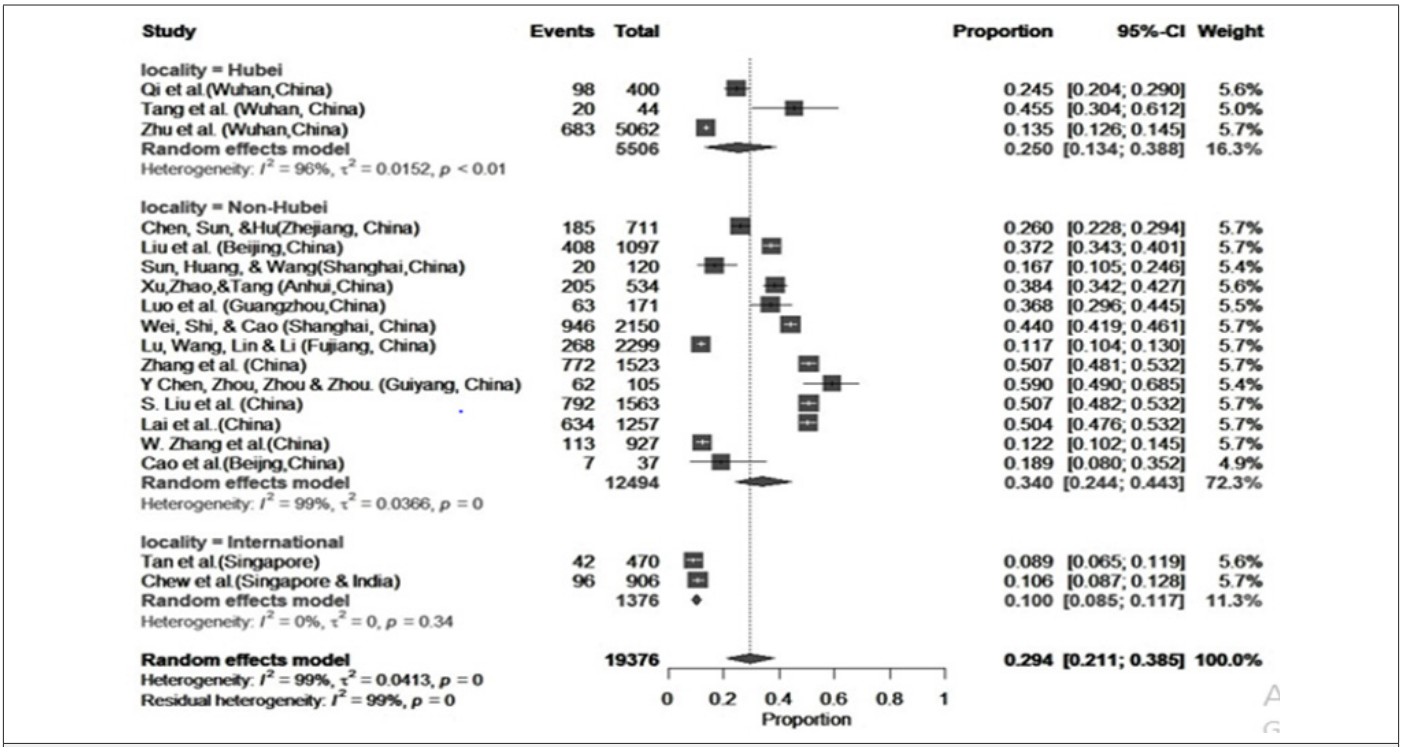

Figure 3: Meta-analysis on depression among health care professionals during COVID-19.

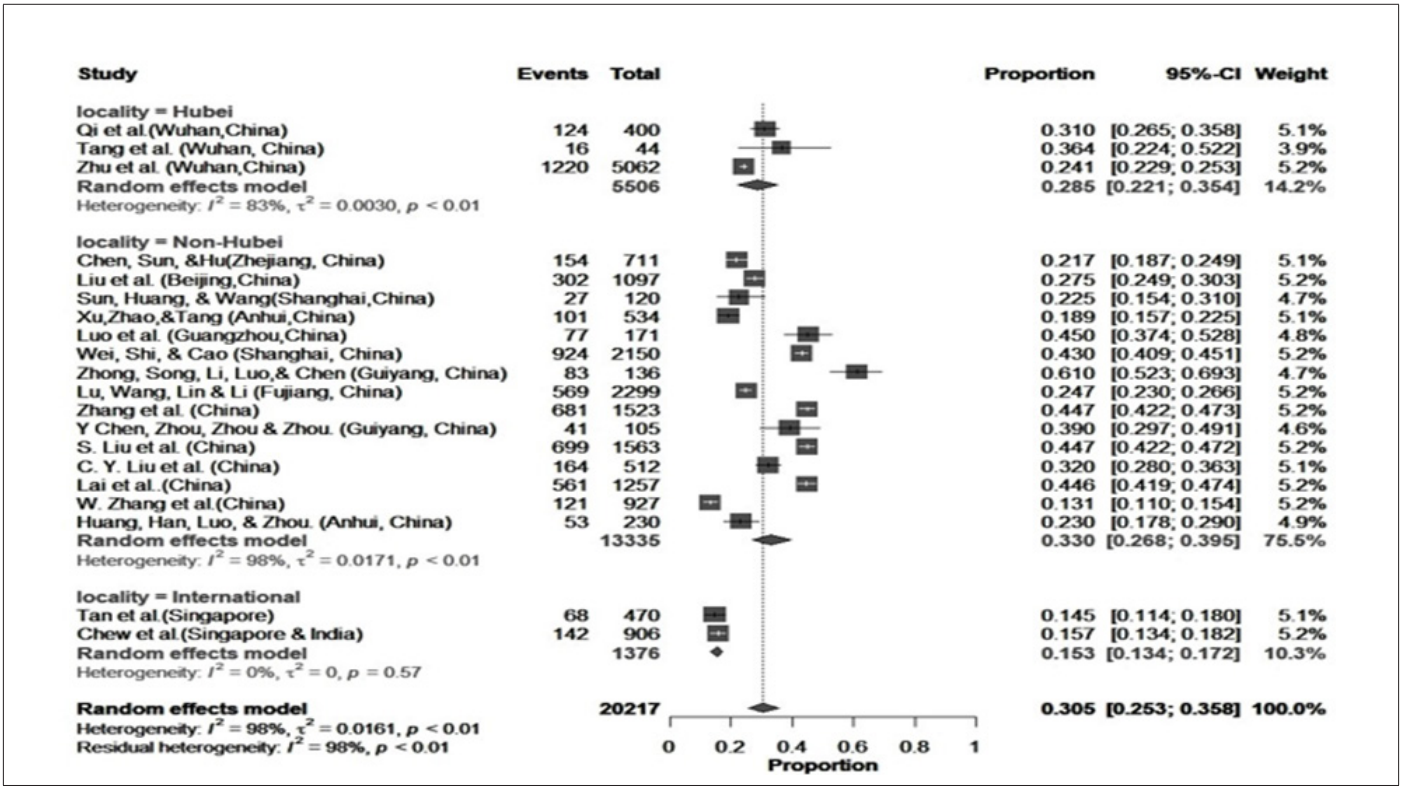

Figure 4: Meta-analysis on anxiety among health care professionals during COVID-19.

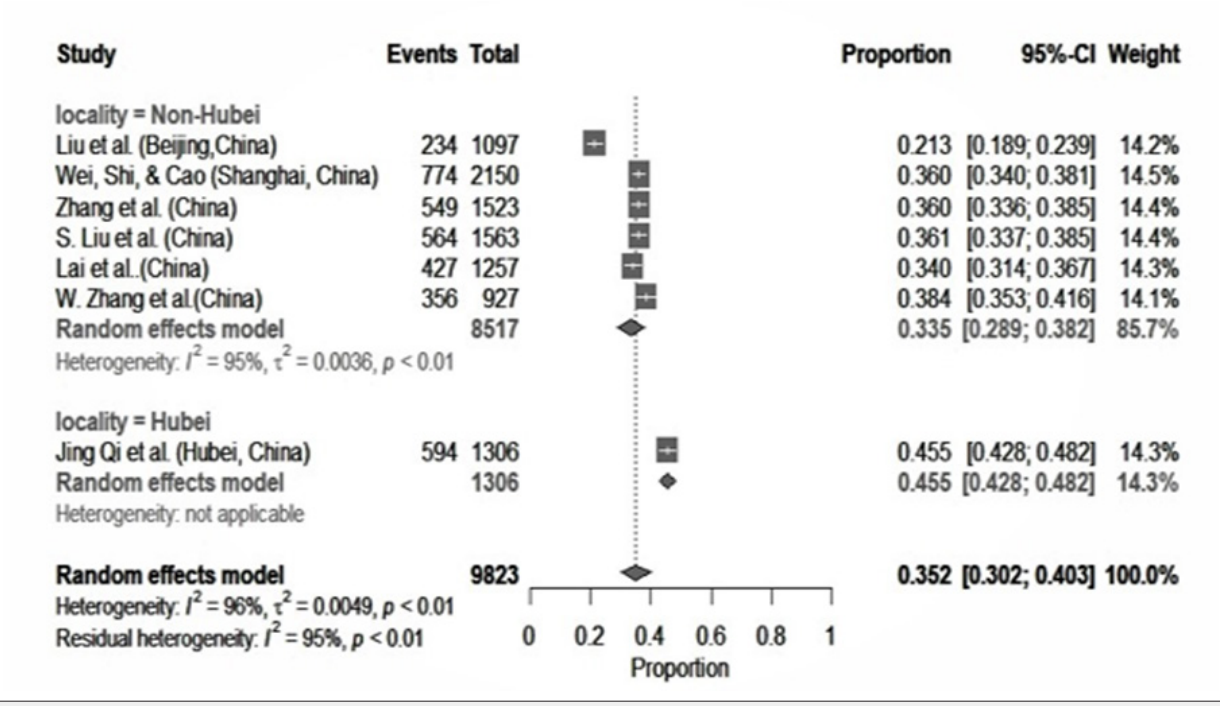

Figure 5: Meta-analysis on insomnia among health care professionals during COVID-19.

Our meta-analysis failed to achieve I2 <50%, and this could be due to the geographic variations, age or gender structure of the study population, and the instruments or the questionnaire being used. Other studies in China had also revealed that female and young adult group were more susceptible to mental health issues [25,26]. However, studies in Italy and Nigeria [27,28], did not find any evidence on mental health of health professional by gender and age groups. Mental health issues among the health professionals and in the community is a worrying concern since the number of COVID-19 is still increasing. In many countries. We need to be prepared to address these issues and take necessary steps in the prevention of these issues [29].

Conclusion

This limited meta-analysis shows that there is high prevalence of mental health issues in the areas affected by COVID=19. It is important that we address the mental health issues early and there is an urgent need to implement mental health interventions identified in the countries affected by COVID-19.

Limitations

Online self-reporting survey was commonly used by the reviewed scholars and this may introduce information and selection bias. Besides, some of the articles had small sample size (n<200) and this may affect the effect size of our analysis.

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