

ORIGINAL ARTICLE

FACTORS ASSOCIATED WITH DEPRESSION, ANXIETY, AND STRESS AMONG FOOD INDUSTRY WORKERS: A SYSTEMATIC REVIEW

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ABSTRACT

In 2021, food industry workers represented approximately one-tenth of the total labour force in Malaysia. There was an estimated 15% of working-age adults who experienced a mental disorder worldwide in 2019. To make the situation worse, service workers in food retail and food services face tremendous stress and mental health consequences during the COVID-19 pandemic. Various study found that worsening mental health and psychological distress have been accelerated substantially by the pandemic. An unsafe or unhealthy working environment can undermine mental health, as poor mental health can interfere with a person's ability to work if left unsupported. This systematic review aimed to evaluate findings related to factors associated with depression, anxiety, and stress among food industry workers. Articles related to these factors were collected electronically from two different databases (EBSCOHOST and Scopus). An independent reviewers screened the titles and abstracts of the collected articles from each database, and then stored them in Google Sheet based on the inclusion and exclusion criteria. Next, the included articles were critically appraised to assess the quality of the studies using the Mixed Methods Appraisal Tool (MMAT). Out of the 292 articles identified, four were included in the final review. Sociodemographic characteristics, as well as biological, psychological, and occupational factors were found to be associated with common mental issues among food industry workers. By identifying the risk factors, specific interventions can be implemented by the employers and other relevant parties to prevent, promote, protect, and support the mental health well-being of food industry workers. These findings may be utilised to improve the implementation of key interventions directed to prevent, promote, protect, and support the mental health of food industry workers. Consequently, an enabling environment can be created to address mental health at work, as outlined by the World Health Organization (WHO). Employers may adapt or revamp their work environment to minimise exposure to psychological risks among their workers, which could prevent workers from experiencing adverse mental health conditions. Workers should also be equipped with awareness and skills, as well as opportunities to recognise and act early on mental health issues in order to promote and protect their mental health. Moreover, workers with pre-existing or ongoing mental health conditions should receive support to access job opportunities, or continue working, and thrive at work, since good mental health status at work can improve an individual's performance and productivity.

Keywords: food industry, food service, mental health, depression, anxiety, stress

INTRODUCTION

A food industry worker can be defined as an individual working with unpackaged food, food equipment or utensils, or food-contact surfaces, as well as involved in the preparation, serving, storage, and delivery of food, while also maintaining the kitchen and dining areas in a clean and sanitary condition. According to the Malaysia Standard Industrial Classification (MSIC)

2008, food and beverage service activities that include restaurants and mobile food services, event catering and other food services, as well as beverage serving activities, are classified together with accommodation services under 'Section I' for the purpose of data reporting¹. In 2021, 1,535,500 people were estimated to be working in activities under 'Section I: Accommodation and Food Service Activities,' which was equivalent to 10.2% of the total labour

force in Malaysia². As work and mental health are closely related, an unsafe or unhealthy working environment can undermine mental health, whilst poor mental health can influence a person's ability to work, if left unsupported.

A decent work condition is essential for mental health. Unreasonable workloads, low job control, and poor job security are usually associated with a poor working environment, which may lead to mental illness among workers. Moreover, work amplifies wider societal issues that negatively affect mental health, including discrimination and inequality. In addition, bullying and psychological violence (also known as 'mobbing') are key complaints of workplace harassment that have a negative impact on mental health. Globally, 15% of working-age adults were estimated to have experienced a mental disorder in 2019³. Approximately 12 billion working days are lost annually due to depression, anxiety, and stress that costs the economy almost USD 1 trillion per year⁴. To make the situation worse, service workers in food retail and food services face tremendous stress and mental health consequences during the COVID-19 pandemic⁵. Various studies found that worsening mental health and psychological distress have been accelerated substantially by the pandemic⁶. There are effective actions to prevent mental health risks at work, which can also protect and promote better mental health at work, and support workers with mental health conditions. The World Health Organization (WHO) has outlined key interventions, such as psychosocial risk management at organisational level, manager and worker training for mental health, reasonable accommodations, return-to-work programmes, and supported employment initiatives⁷. However, a systematic review is necessary to comprehensively understand the factors contributing to mental health issues among food industry workers, tailor interventions, and address unique challenges despite existing WHO interventions. Hence, this systematic review aimed to evaluate and present the factors associated with mental health issues (depression, anxiety, stress and combination of mental health issues) among food industry workers.

MATERIALS AND METHODS

This systematic review was prepared in accordance with the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta Analyses) updated guideline. The objective of this review was to identify the factors associated with common mental health issues among food industry workers. The components of mnemonic PEO (population, exposure, outcome) were established as follows:

- Population: food industry workers.
- Exposure: associated factors of mental health.
- Outcome: mental health issues.

Search Strategy

A literature search was conducted from 15 October until 30 November 2022 using Ebscohost and Scopus databases. The following keywords were used to search related articles: "food industry*" OR "food service*" OR "restaurant*" for the population; AND "factor*" OR "determinant*" OR "predictor*" for the exposure; AND "mental health" OR "mental illness*" OR "mental disorder*" OR "stress" OR "anxiety" OR "depression" for the outcome. All retrieved articles were imported into Google Sheet library, and library deduplication was implemented using Microsoft Excel.

Eligibility Criteria

The inclusion criteria were as follows: (1) publication in the English language; (2) publication between 2010 and 2022; (3) original articles, including cohort, case-control, and cross-sectional that investigated the associated factors of common mental health issues among food industry workers. Mixed method and qualitative studies, as well as non-original articles, such as conference proceedings, perspective, commentary, opinion, reports, systematic reviews, and meta-analyses were excluded.

Study Selection

Two independent reviewers screened the titles and abstracts of the retrieved materials from each database against the inclusion and exclusion criteria. Potential articles identified during the main screening were kept, and each full text was reviewed independently by a third reviewer according to the inclusion and exclusion criteria. A fourth reviewer was assigned to resolve any disagreements that arose between the previous reviewers.

Critical Appraisal and Data Extraction

Quality appraisal was conducted using the Mixed Methods Appraisal Tool (MMAT). The MMAT was used to evaluate the quality of the methodological criteria, including five core quality criteria of each selected article. One reviewer extracted the data, which were then assessed independently by a second reviewer. Eligible articles were analysed in detail using the content analysis method without any statistical tests.

RESULTS

The search yielded 208 articles from EBSCOHOST and 84 from SCOPUS, resulting in 292 unique hits. Only 16 articles are included in the full-text assessment after a rigorous selection screening, as shown in the PRISMA flow diagram (Figure 1). A list of the studies included in this review, locations, and designs is presented in Table 1. The findings from four studies are included in this systematic review, as shown in Table 2. The analysed articles were published between 2020 and 2022. All articles included were cross-sectional studies.

Table 1. A list of authors, study locations and study design.

Authors	Study Location	Study Design
Sornsenee et al. (2022) ⁸	Songkhla province, southern Thailand	Cross-sectional study
Machado et al. (2021) ⁹	Brazil	Cross-sectional study
Saah et al. (2021) ¹⁰	Accra metropolis, Ghana	Cross-sectional study
Kamal et al. (2020) ¹¹	Klang Valley, Malaysia	Cross-sectional study

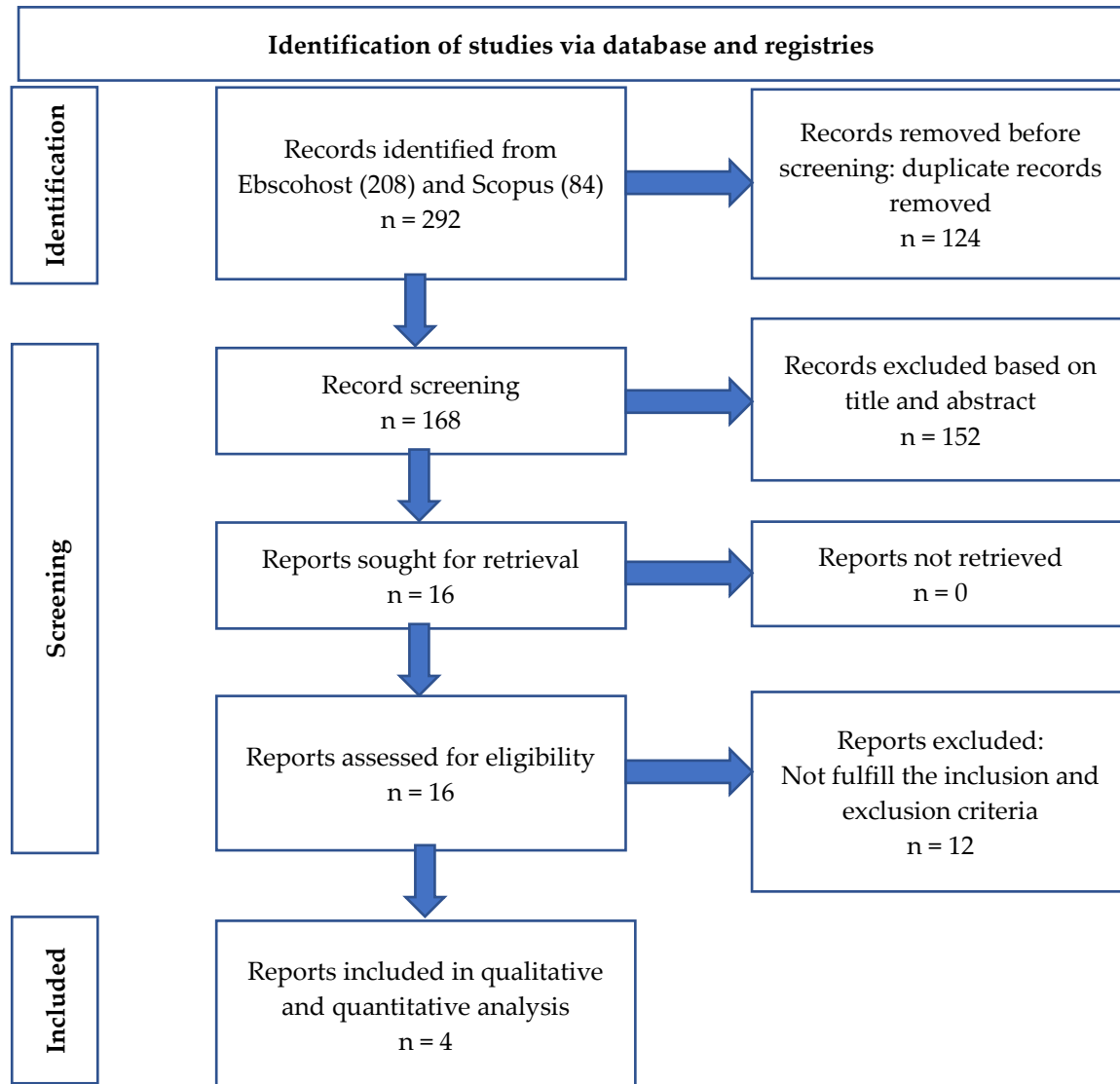


Figure 1. PRISMA flow diagram for the systematic review.

Common Mental Health Issues of Food Industry Workers

This article will present four studies that were focused on common mental health issues among food industry workers. Factors that affect mental health conditions among food industry workers were divided into (i) sociodemographic characteristics, (ii) biological, (iii) psychological, and (iv) occupational factors. The studies included in this review showed significant effects on mental health conditions among food industry workers. Factors that hindered the mental health conditions among food industry workers during the COVID-19 pandemic were also identified in one of the studies.

Prevalences of Common Mental Health Issues Among Food Industry Workers

Depression. Three studies described the prevalence of depression among food industry workers⁸⁻¹⁰. Saah et al. found 38.3% prevalence of depression among waiters working in upscale restaurants in Accra, Ghana¹⁰. In the study conducted by Machado et al. 20.6% of gastronomes who worked in Brazilian commercial restaurants reported experiencing depressive symptoms⁹. Finally, the prevalence of depressive symptoms among Thai micro, small, and medium restaurant (MSME) entrepreneurs was 11.6%⁸.

Table 2. Summary of accepted articles.

Author (Year)	Title	Study Design	Sample Size	Study Outcomes	Associated Factors
Sornsenee et al. (2022) ⁸	Factors associated with anxiety and depression among micro, small, and medium restaurant entrepreneurs due to Thailand's COVID-19-related restrictions: a cross-sectional study.	Cross-sectional study	181	<p>Outcomes studied:</p> <ol style="list-style-type: none"> Anxiety Depression <p>Prevalence:</p> <ol style="list-style-type: none"> Anxiety, 22 (12.2%). Depression, 21 (11.6%) 	<p>Predictors:</p> <ol style="list-style-type: none"> Anxiety: <ol style="list-style-type: none"> High education level (AOR = 0.1, 95% CI = 0.02-0.56, p = 0.009) Family history of psychological disorders (AOR = 34.94, 95% CI = 3.36-363.58, p = 0.003) Underlying medical disease (AOR = 7.14, 95% CI = 0.02-0.84, p = 0.032) Substance used as coping mechanism (AOR = 8.59, 95% CI = 1.43-51.66, p = 0.019) Concerns about obtaining resources and securing a hospital bed for COVID-19 (AOR = 5.67, 95% CI = 1.10-29.35, p = 0.038) High debt to income ratio (AOR = 73.75, 95% CI = 3.27-1665.63, p = 0.007) Depression: <ol style="list-style-type: none"> Underlying medical disease (AOR = 14.29, 95% CI = 2.63-100.00, p = 0.032) Lack of access to government supportive measures (AOR = 6.94, 95% CI = 1.64-29.37, p = 0.009)
Machado et al. (2021) ⁹	Stress, anxiety, and depression among gastronomes: association with workplace mobbing and work-family interaction.	Cross-sectional study	160	<p>Outcomes studied:</p> <ol style="list-style-type: none"> Stress Anxiety Depression <p>Prevalence:</p> <ol style="list-style-type: none"> Stress, 13 (7.2%) Anxiety, 34 (18.9%) Depression, 37 (20.6%) 	<p>Predictors:</p> <ol style="list-style-type: none"> Stress: <ol style="list-style-type: none"> Specific behaviours of mobbing at work ($r = 0.16$, $p < 0.05$) Negative work-family interference (WFI-) ($r = 0.53$, $p < 0.01$) Negative family-work interference (FWI-) ($r = 0.42$, $p < 0.01$)

Author (Year)	Title	Study Design	Sample Size	Study Outcomes	Associated Factors
					<ul style="list-style-type: none"> d. Positive family-work interference (FWI+) ($r = 0.21, p < 0.05$) 2. Anxiety: <ul style="list-style-type: none"> a. Specific behaviours of mobbing at work ($r = 0.16, p < 0.05$) b. Negative work-family interference (WFI-) ($r = 0.49, p < 0.01$) c. Negative family-work interference (FWI-) ($r = 0.47, p < 0.01$) d. Positive family-work interference (FWI+) ($r = 0.17, p < 0.05$) 3. Depression: <ul style="list-style-type: none"> a. Negative work-family interference (WFI-) ($r = 0.49, p < 0.01$) b. Negative family-work interference (FWI-) ($r = 0.44, p < 0.01$)
Saah et al. (2021) ¹⁰	Prevalence and predictors of work-related depression, anxiety, and stress among waiters: a cross-sectional study in upscale restaurants.	Cross-sectional study	384	Outcomes studied: <ol style="list-style-type: none"> 1. Depression 2. Anxiety 3. Stress Prevalence: <ol style="list-style-type: none"> 1. Depression, 22 (38.3%) 2. Anxiety, 201 (52.3%) 3. Stress, 132 (34.4%) 4. At least one mental health problem, 229 (59.6%) 5. All three mental health conditions, 95 (24.7%) 	Predictors: <ol style="list-style-type: none"> 1. Depression: <ul style="list-style-type: none"> a. Females (AOR = 1.69, 95% CI = 1.02-2.79, $p = 0.041$) b. Foresee better remuneration (AOR = 3.09, 95% CI = 1.95-4.87, $p < 0.001$) c. Non-prescription drugs used (AOR = 2.22, 95% CI = 1.39-3.55, $p = 0.001$) 2. Anxiety: <ul style="list-style-type: none"> a. Females (AOR = 1.86, 95% CI = 1.17-2.96, $p = 0.009$) b. Foresee better remuneration (AOR = 2.85, 95% CI = 1.82-4.49, $p < 0.001$) c. Non-prescription drugs used (AOR = 2.13, 95% CI = 1.38-3.28, $p = 0.001$)

Author (Year)	Title	Study Design	Sample Size	Study Outcomes	Associated Factors
					<ul style="list-style-type: none"> 3. Stress: <ul style="list-style-type: none"> a. Females AOR = 1.86, 95%CI = 1.17-2.96), b. Foresee better remuneration (AOR = 2.99, 95% CI = 1.85-4.83, p < 0.001) c. Non-prescription drugs used (AOR = 3.16, 95% CI = 1.93-5.17, p < 0.001)
Kamal et al. (2020) ¹¹	The influence of Japanese work cultures on Malaysian foodservice employees' work stress and their turnover intention.	Cross-sectional study	318	Outcomes studied: 1. Workplace stress	Predictors: 1. Workplace stress: <ul style="list-style-type: none"> a. Japanese work culture ($\beta = 0.494$, p < 0.001) b. Hard work & loyalty ($\beta = 0.290$, p < 0.001) c. Work ethics ($\beta = 0.272$, p < 0.001) d. Work practice ($\beta = 0.223$, p < 0.001)

Note: AOR = adjusted odd ratio; 95% CI = 95% confidence interval; p = p-value; r = correlation coefficient; β = adjusted regression coefficient

Anxiety. Three studies reported the presence of anxiety among food industry workers⁸⁻¹⁰. Saah et al. reported 52.3% of their participants manifested anxiety symptoms¹⁰. Machado et al. found that 18.9% of their participants reported to have anxiety⁹. Lastly, the prevalence of anxiety symptoms among Thai MMSE entrepreneurs was 12.2%⁸. **Stress.** Two studies explored the prevalence of stress among food industry workers^{9,10}. Saah et al. found that 34.4% of the participants reported feeling stressed¹⁰. In the study performed by Machado et al., only 7.2% of their participants reported being stressed⁹.

Combinations of mental health issues. One study identified the prevalence of several combinations of mental health issues among food industry workers¹⁰. The prevalence of participants with at least one mental health condition (depression, anxiety, and/or stress) was 59.6%. They also revealed that approximately 24.7% of the participants reported to experience all three mental health problems (depression, anxiety, and stress)¹⁰.

Factors Associated With Depression, Anxiety, and Stress Among Food Industry Workers

Sociodemographic Factors

Gender. One study found that gender can affect the mental health well-being of food industry workers. The prevalence of depression (41.6%, AOR = 1.69, 95% CI = 1.02-2.79, $p = 0.041$), anxiety (56.9%, AOR = 1.86, 95% CI = 1.17-2.96, $p = 0.009$), and stress (38.2%, AOR = 1.86, 95% CI = 1.17-2.96, $p = 0.009$) among female waiters in upscale restaurants were significantly higher than their male counterparts (depression at 30.8%, anxiety at 41.9%, and stress at 25.6%)¹⁰.

Education level. Another study explored the association between the education level of food industry workers and their mental well-being. Micro, small, and medium restaurant (MSME) entrepreneurs with high education level (AOR = 0.1, 95% CI = 0.02-0.56, $p = 0.009$) were found to be significantly less likely to experience anxiety compared to those with a lower education level⁸.

Biological Factors

Medical comorbidity. One study found that biological risk factors can influence the mental health outcome of food industry workers. MSME entrepreneurs with an underlying medical disease, such as diabetes mellitus, hypertension, dyslipidemia, asthma, cardiac disease, chronic kidney disease, or cancer have 14 times higher odds of experiencing depression (AOR = 14.29, 95% CI = 2.63-100.00, $p = 0.032$), and 7 times higher odds of experiencing anxiety (AOR = 7.14, 95% CI = 0.02-0.84, $p = 0.032$) compared to entrepreneurs with no medical comorbidity⁸.

Family history. Family history of psychological disorders can also play an important role in

mental health-related conditions. Entrepreneurs with a positive family history of psychological disorders have a significantly higher risk of experiencing anxiety compared to those with no family history of psychological disorders (AOR = 34.94, 95% CI = 3.36-363.58, $p = 0.003$)⁸.

Psychological Factors

Substance use. Substance use as a coping mechanism against anxiety by food industry workers placed them at higher risks of developing anxiety (AOR = 8.59, 95% CI = 1.43-51.66, $p = 0.019$)⁸. Another study reported a similar finding, whereby workers with non-prescription drug use have 2 times higher risk of developing depression (AOR = 2.22, 95% CI = 1.39-3.55, $p < 0.001$) and anxiety (AOR = 2.13, 95% CI = 1.38-3.28, $p < 0.001$), and 3 times higher risk of experiencing stress (AOR = 3.16, 95% CI = 1.93-5.17, $p < 0.001$)¹⁰.

Occupational Factors

Debt-to-income ratio. Workers with a high debt-to-income ratio were more likely to experience anxiety (AOR = 73.75, 95% CI = 3.27-1665.63, $p = 0.007$) compared to those with a low debt-to-income ratio⁸.

Mobbing at work. A study of gastronomes in Brazil in 2021 found a significant, weak positive correlation between mobbing at the workplace and anxiety ($r = 0.16$, $p < 0.05$) and stress ($r = 0.16$, $p < 0.05$) among them⁹.

Work-family interaction. Significant findings related to work-family interactions among Brazilian gastronomes were divided into three types: (1) negative work-family interference (WFI-), which assessed the negative impact of situations at work on family functioning; (2) negative family-work interference (FWI-), which measured the negative impact of family issues on work; and (3) positive family-work interference (FWI+), as characterised by the positive impact of family functioning on positive work situations. WFI- and FWI- showed significant moderate positive associations with depression ($r = 0.49$, $p < 0.01$; $r = 0.44$, $p < 0.01$), anxiety ($r = 0.49$, $p < 0.01$; $r = 0.47$, $p < 0.01$), and stress ($r = 0.53$, $p < 0.01$; $r = 0.42$, $p < 0.01$), respectively⁹. Their study also found a significant, weak positive association between FWI+ and anxiety ($r = 0.17$, $p < 0.05$) and stress ($r = 0.21$, $p < 0.05$)⁹.

Remuneration. Workers who foresaw better remuneration were more than 3 times likely to experience depression (AOR = 3.09, 95% CI = 1.95, 4.87, $p < 0.001$), anxiety (AOR = 2.85, 95% CI = 1.82, 4.49, $p < 0.001$), and stress (AOR = 2.99, 95% CI = 1.85, 4.83, $p < 0.001$) compared to those who did not¹⁰.

Japanese work culture. The Japanese work cultures have long been characterised with hard work, long working hours, loyalty and meticulous

work ethics¹¹. Workers who practised Japanese work culture were more likely to experience workplace stress ($\beta = 0.494, p < 0.001$) compared to those who did not have a similar work culture¹¹. *Hard work and loyalty.* Workers in Japanese restaurants who were hard-working and loyal ($\beta = 0.290, p < 0.001$) were more likely to experience workplace stress than those without similar qualities¹¹.

Work ethics. Works ethics deals with the rules and procedures that should be carried out by the employer and the employees in maintaining a professional company culture. Employees in Japan are generally known for their obligation to their places of work, and they work to succeed and prosper¹¹. workers who practised Japanese work ethics faced a higher likelihood to experience workplace stress ($\beta = 0.272, p < 0.001$) compared to those who did not demonstrate similar work ethics¹¹.

Work practice. Work practices reflect how employees do their job according to the common practice of an organisation. Some of the distinctive characteristics of Japanese corporations are strict hierarchical structures, risk aversion and obsession for detail¹¹. Workers who abided by Japanese work practices faced a higher likelihood to experience workplace stress ($\beta = 0.223, p < 0.001$) compared to those who did not demonstrate a similar work practice¹¹.

Factors Associated with Mental Health Conditions during COVID-19

Concerns about COVID-19. Workers with concerns about obtaining resources and securing a hospital bed for COVID-19 were at a higher risk of developing anxiety (AOR = 5.67, 95% CI = 1.1, 29.35, $p = 0.009$)⁸.

Government supportive measures. Micro, small, and medium-sized enterprises (MSMEs) are an important driver of Thailand’s economy. Throughout the COVID-19 crisis, the Office of Small and Medium Enterprises Promotion (OSMEP) and other agencies financially assisted MSME entrepreneurs by implementing policies that encourage entrepreneurs nationwide to register and take advantage of the government’s stimulus packages⁸. However. Entrepreneurs with a lack of access to government supportive measures faced increased risk of depression (AOR = 6.94, 95% CI = 1.64, 29.37, $p = 0.009$)⁸. The suggestion was made by the author for the government to provide adequate business support to MSMEs to help them manage their businesses and mitigate the negative impact of COVID-19 on their mental health⁸.

Risk of Bias

In this review, the methodology quality of all four studies was appraised using the Mixed Methods Appraisal Tool (MMAT) based on five criteria¹². Details of this assessment are reported in Table 3.

Table 3. Details of the MMAT assessment.

Author	Type of Study	1.1	1.2	1.3	1.4	1.5
		Is the sampling strategy relevant to address the question?	Is the sample representative of the research population?	Are the measurements appropriate?	Is the risk of nonresponse bias low?	Is the statistical analysis of appropriate to answer the research question?
Sornsenee al. (2022) ⁸	Quantitative descriptive study	No	No	Yes	No	Yes
Machado et al. (2021) ⁹	Quantitative descriptive study	Yes	Yes	Yes	Yes	Yes
Saah et al. (2021) ¹⁰	Quantitative descriptive study	Yes	Yes	Yes	Yes	Yes
Kamal et al. (2020) ¹¹	Quantitative descriptive study	Yes	Yes	Yes	Yes	Yes

DISCUSSION

The prevalence of mental health issues; depression ranges from 11.6% to 38.3%⁸⁻¹⁰; anxiety ranges from 12.2% to 52.3%⁸⁻¹⁰; stress ranges from 7.2% to 34.4%^{9,10}; and combinations of mental health issues was approximately 24.7%¹⁰. Several

factors that contributed to common mental health issues among food industry workers were identified and classified in this review into five categories: (1) sociodemographic factors; (2) biological factors; (3) psychological factors; (4) occupational factors; and (5) factors associated with mental health conditions during COVID-19.

Appropriate intervention of these risk factors can influence the productivity of a worker. Strong evidence was found by a previous study, whereby high levels of mental health well-being can increase productivity by as much as 12% among workers¹³.

Sociodemographic Factors

Gender and education level were noted to be significantly associated with common mental health issues among food industry workers. Female workers were reported to facing a higher prevalence of mental health conditions compared to their male counterparts¹⁰. This finding was consistent with data from the WHO, whereby the global prevalence of mental disorders in 2019 was higher among females (52.4%) compared to among males (47.6%)³. In this review, MSME entrepreneurs with high education level were found to be significantly less likely to experience anxiety compared to those with a lower education level⁸. This finding is consistent with other study demonstrated that workers with lower education levels have a higher tendency to experience mental health problems compared to those with higher education levels. This phenomenon could be explained as low education level was also associated with a lack of sense of control and resilience, and the ability to delay gratification, which can lead to mental health issues¹⁴.

Biological Factors

Generally, an individual with a history of medical comorbidity and family history of psychological disorders has a higher chance of being identified as a high-risk individual to suffer from mental health problems. Food industry workers with medical comorbidity and/or those with a family history of psychological disorders have a higher likelihood of developing mental health conditions⁸. These findings were consistent with previous studies, whereby people with comorbidities and family history have higher risks of developing mental health illnesses¹⁵⁻¹⁷. Similarly, familial factors have been associated with psychiatric illness impacting the cognitive ability of young and working groups¹⁷. This phenomenon could be explained from study on genetic and epigenetic factors. The study emphasized that mental health problem such as depression is a polygenic disease and genetic contributions are due to different genes, which each gene contributes relatively little impact. In addition, exposure to environmental influences in utero or early life produces impacts that could be inherited across generations and are associated with genetic or epigenetic changes¹⁸.

Psychological Factors

Findings from two studies were similar, whereby use of substance and non-prescription drugs affected the mental health status of food industry workers^{8,10}. Workers who used certain substances to cope with anxiety, and those who use non-prescription drugs were at higher risks of

developing mental health conditions. Significant evidence of a correlation between substance use, for example, cannabis, and mental health disorders can be found in previous literature¹⁹. This phenomenon could be explained as the chemical component of the substance can effect the brain. Study on the effect of cannabis on the brain found that, the main active component of cannabis or marijuana is THC (delta-9-tetrahydrocannabinol), a compound that activates the endogenous CB1 receptor, which is in high concentration in hippocampus, amygdala, cerebellum, basal ganglia and regions of the cerebral cortex. Recent advances in the understanding of brain cannabinoid receptor function have renewed interest in the association between cannabinoid compounds and psychosis, and some evidence exists for a "cannabinoid hypothesis" of schizophrenia^{20,21}.

Occupational Factors

A significant positive correlation was found between work-family interaction and mental health conditions among food industry workers⁹. This finding was supported by previous studies, whereby working conditions can interfere with worker-family relationships and vice versa, as well as with the workers' emotional status²²⁻²⁴. Another study has identified that problematic behaviours at work, such as mobbing, were positively correlated with the prevalence of mental health conditions among food industry workers⁹. Previous studies have similar findings of workers' mental health being negatively influenced by harassments at work^{22,23}. In fact, the quality of life of the victims were also affected, including their personal relationships. Occupational factors, such as work culture, were also found to be affecting the mental health well-being of food industry workers. A significant association was found between Japanese work cultures, including hard work and loyalty, work ethics, and work practice, and workplace stress¹¹.

The high expectations and demands in certain work cultures might increase the risk of experiencing workplace stress. Certain work cultures are known for their trend of working hard, with strict obligations to succeed and prosper. These work cultures may lead to turnover intention and to search for better role prospects among food industry workers²⁵. Workers with the ability to foresee better remuneration were also at a higher chance of experiencing poor mental health¹⁰. This finding was consistent with an earlier study, in which workers lacking employment security were at a higher risk of developing depression, anxiety, and stress^{22,26}. A high debt-to-income ratio is a financial statistic that compares an individual's total monthly debt payments to their gross monthly income; when it is high, it implies that a significant amount of their earnings is allocated to debt servicing. This could indicate a problematic financial condition. In this review, high debt-to-income ratios among

food industry workers can also increase the risk of developing mental health problems^{8,27}.

Factors Associated with Mental Health Conditions during COVID-19

In this review, only one study identified the risk factors related to mental health conditions during the COVID-19 pandemic⁸. Food industry workers who were concerned about obtaining resources, while facing a lack of government support have been shown to face higher risks of developing anxiety, and depression. Similarly, the mobility restriction of inter- and intra-countries, together with physical restrictions, have made the hospitalisation process more difficult during the recent pandemic, which unintentionally created public anxiety²⁸. Furthermore, reduced or low support from the government for the general public, in terms of economic and social aspects, was found to be associated to an increased incidence of stress and depression²⁹.

Recommendation

These selected studies have provided significant evidence of factors associated with mental health issues (depression, anxiety, stress and combination of mental health issues) among food industry workers. Employers or stakeholders need to identify and tackle related risk factors that are contributing towards mental health problems among workers, as an effort to improve their psychosocial well-being, which in turn could enhance their productivity. Specific interventions can be implemented by relevant parties to address mental health issues among high-risk groups of food industry worker targeting among female, lower education, having family history of mental disorder, substance used, poor working condition, work culture, work insecurity, high debt-to-income ratio, and impact of COVID-19 pandemic.

Employers may adapt or revamp work environment to minimise exposure to psychological risks among their workers and prevent workers from experiencing adverse mental health conditions. In addition, workers should be equipped with awareness and skills, as well as offered opportunities to recognise and act on their mental health issues early to protect their mental health. Moreover, workers with pre-existing or ongoing mental health conditions should receive support to access job opportunities, or to continue working and thrive at work. Lastly, more research regarding mental health issues among food industry workers should be encouraged, with the aim of improving general understanding related to undesired issues. Stronger study designs, such as cohort studies, should be conducted in future research in order to determine the causal effect of common mental health issues among food industry workers.

Limitation

As with any research, this systematic review was not without limitations. The role of publication bias in this systematic review must be acknowledged, as grey literature was not included. Although several procedures were used to search for relevant journal articles, only two scientific databases were used, which contributed towards a low access to relevant articles in other databases. Language bias should also be considered, as this review only included articles published in English, although the search strategy resulted in articles sourced from countries where English is not the primary language (e.g., Indonesia, China, and Japan). Despite these limitations, this systematic review was able to synthesise research evidence on the factors associated with common mental health issues among food industry workers, which may serve as a guide to improve the implementation of strategies to address mental health issues at work.

CONCLUSION

Female, lower education, having family history of mental disorder, substance used, poor working condition, work culture, work insecurity, high debt-to-income ratio, and impact of COVID-19 pandemic was found to affect the mental health of food industry workers. These findings may be utilised to improve the implementation of key interventions directed to prevent, promote, protect, and support the mental health of food industry workers, which would help create an enabling environment to address mental health issues at work, as outlined by the WHO.

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