REVIEW ARTICLE

COVID-19 Pandemic Fatigue: A Scoping Review of the Literature

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ABSTRACT

Pandemic fatigue encompasses exhaustion, emotional strain, and decreased motivation due to prolonged pandemic effects. This scoping review examines pandemic fatigue issues related to COVID-19, aiming to suggest effective management strategies. We assessed 2,558 records from 1st of December 2019 until 27th of March 2022 in PubMed, Science Direct, ProQuest, and ClinicalKey. Following Arksey and O'Malley (2005) and PRISMA-ScR principles, we selected 31 studies including research papers employing either quantitative or qualitative methods and editorials and other summary articles after excluding redundant and irrelevant works. The authors provide six critical answers to understand better and manage pandemic fatigue, including the need for more research and support, the collaboration between key stakeholders and the community, and the use of information to address pandemic fatigue. The review found that pandemic fatigue is prevalent among certain groups, such as students and healthcare workers. Factors contributing to pandemic fatigue include age, gender, high perceived severity of COVID-19, low trust in government or health organizations, and low social connectedness. The review also identified an instrument, the COVID-19 Pandemic Fatigue Scale, that can be used to measure pandemic fatigue. The review concluded that identifying pandemic fatigue as early as possible is absolutely important and people and their government should work together to handle the fatigue. Many countries have acknowledged the presence hence manage it differently. Nonetheless the strategy suggested by WHO has provided an excellent framework to tackle the pandemic fatigue.
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INTRODUCTION

The world has been plagued by the COVID-19 pandemic since the end of 2019 until now. The virus which causes severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), was first detected in Wuhan, China (1). The coronavirus specific nucleic acid sequence of the 2019-nCoV differs from those of known human coronavirus species such as Middle East respiratory syndrome (MERS), severe acute respiratory syndrome (SARS) and other coronaviruses that causes pneumonia (2, 3). Even though we are living in the best era of in modern technology with up-to-date health equipment and utilities, the number of COVID-19 cases continues to rise daily (4). Using the WHO data on the cumulative number of deaths until March 1, 2020, the COVID-19 mortality rates was 5.6% (95% CI 5.4, 5.8) for China and 15.2% (12.5%–17.9%) outside of China (5). Thus, the World Health Organization (WHO) declared the coronavirus disease 2019 (COVID-19) outbreak a public health emergency of international concern (PHEIC) on January 30, 2020, and a pandemic on March 11, 2020 (6). At its peak, we observed the devastation not only in terms of health, but in various aspects including economics and social well-being.

After the WHO declared the COVID-19 pandemic, various measures have been taken to contain the pandemic. Among them, the government has established several rules that fundamentally reduce interaction between people via implementing lockdowns or "stay-at-home" orders. This is one public health measure of the social isolation restrictions taken to stop the COVID-19 chain of infection because the virus spreads rapidly through human-to-human transmission (7). For example, most state governments in the United States have a stay-at-home order from March 19 to April 7, 2020 (8). While on March 23, 2020, Prime Minister Boris Johnson announced a COVID-19 lockdown in the

United Kingdom (9). At the same time, Australia also began living, 2020 strict lockdown rules on March 23, 2020 (10).

During the beginning of the lockdown's implementation, most people worldwide obeyed the law and standard operating procedures imposed by the government. This is due to the fear that the virus is highly infectious and extremely lethal, especially to vulnerable groups, and causes negative health effects and complications (11). However, all measures taken to halt the spread of COVID-19, such as closing many economic sectors and ordering the public to stay at home, have had devastating effects not only on the economy but also on the health and social well-being (12, 13). After a few months of lockdown periods, the numbers of COVID-19 cases continue to rise, with new COVID-19 variants causing the pandemic period to continue unexpectedly longer. Therefore, humans became demotivated and disobeyed the rules, which is evident in some countries (14, 15, 16). According to the WHO, this condition is known as pandemic fatigue (PF). By definition, pandemic fatigue is the demotivation to follow recommended protective behaviours, emerging gradually over time and affected by a number of emotions, experiences and perceptions (17).

The fact that pandemic fatigue can cause failure of controlling the spreading of the COVID-19 infection is undeniable. It is crucial for us to identify the causes of pandemic fatigue so that targeted interventions can be figured out. According to a study conducted in Italy, the population's declining sensitivity towards the global pandemic could cause 32,000 more deaths by the end of 2020 (18). Not only that, from the way things are going, it is likely that the decreasing trend of risk mitigation behaviour could possibly hinder the national and global efforts to contain the spread of the virus. This is because, it will be long till we reach the herd immunity of world population and what with the new strains that resulted from the virus mutation such as delta, omicron and it's subvariants keep appearing one after another, public's adherence to risk mitigation behaviour remains as the most suitable and effective way on containing the virus (19).

The introduction of vaccine was a great relief initially where we have observed a decline in the trend of COVID-19 cases and mortality rates (20). Unfortunately, as time went on, after complete COVID-19 vaccination, there is waning immunity over time which reduce the optimal protection against the COVID-19 virus (21). In addition, there is inadequate vaccination coverage in a few regions, especially in poor countries, making the goal of eradicating the virus less possible (22). Thus, decreasing trend of risk mitigation behaviour could hinder the national and global efforts to contain the spread of the virus.

Therefore, the objective of this scoping review is then to explore the existing and current literatures of pandemic fatigue which have been conducted so far. The aim is to investigate current existing literatures related to the pandemic fatigue (PF) so that necessary measures may be suggested to ensure the condition can be managed successfully, indirectly preventing the cases from escalating further.

METHODOLOGY

A scoping review was conducted to delineate relevant scientific literature to complete the work. We utilised the five-phase framework for conducting scoping reviews by Arksey and O'Malley (23), which comprises of i) Identifying the research questions, ii) Identifying relevant studies, iii) Study selection: inclusion and exclusion criteria, iv) Charting the data, and v) Collating, summarising and reporting the results.

Identifying the research questions

We aimed to answer the following questions, all of which would provide better understanding so that appropriate suggestion could be proposed in assisting the management of pandemic fatigue leading to put a stop in the escalating cases.

1. What are the causes of the fatigue?
2. What is the prevalence of pandemic fatigue in many countries worldwide?
3. What is the consequence of pandemic fatigue?
4. What is the pattern of obeying the instruction?
5. How does the government overcome the problem of pandemic fatigue?

Identifying relevant studies

A comprehensive electronic literature search of relevant peer-reviewed journal articles was conducted on March 27, 2022, using four databases: PubMed, Science Direct, ProQuest, and ClinicalKey. We collected relevant articles through available databases under the researchers' institution, dated from 1st of December 2019 until the 27th of March 2022 as illustrated in Table I. The MeSH term used for the search was (pandemic OR COVID-19 OR COVID OR coronavirus) AND (fatigue OR lockdown) NOT (burnout OR compassion fatigue OR mental health OR mental illness OR depression OR anxiety OR stress).

Identifying search terms included brainstorming, pre-existing knowledge, and using the thesaurus in each database. The MeSH term was used in each included database to obtain articles.

Study selection: inclusion and exclusion criteria

The study selection for inclusion and exclusion criteria was summarised in Table II. The study included observational studies, clinical trials, clinical case studies, review articles, opinions, and brief communications.

Table I: Search strategy and the MeSH terms and keywords used

Databases	Duration	Population	MeSH terms and keywords	
			Pandemic COVID-19	**Fatigue**
PubMed, Science Direct, ProQuest, and ClinicalKey. (under the availability of researchers' institution)	1st of December 2019 until the 27th of March 2022	Adults' population worldwide	(pandemic OR COVID-19 OR COVID OR coronavirus) AND	(fatigue OR lockdown) NOT (burnout OR compassion fatigue OR mental health OR mental illness OR depression OR anxiety OR stress).

Table II: Study selection: inclusion and exclusion criteria

Inclusion criteria	Exclusion criteria
1. Observational studies, clinical trials, clinical case studies, review articles, opinions, and brief communications	1. Preprints and articles for which the authors' university access is not available
2. Articles in the English language	2. Articles that include:
3. Available full articles	Physical and mental fatigue as a consequence of COVID-19 infection
	Burnout or fatigue related to handling the pandemic among the front liners.
	Other types of fatigue which the discussion in the article did not discuss the demotivation to follow recommended protective behaviours.

Preprints and articles for which the authors' university access is not available and those in languages other than English were not included. Only studies in the English language with available full articles were included. With this, we recorded 2,558 articles through database searching.

Next, we selected articles that discussed and related the pandemic fatigue to the demotivation to follow recommended protective behaviours, emerging gradually over time and affected by a number of emotions, experiences and perceptions (17). Hence excluded the following articles:

1. Physical and mental fatigue as a consequence of COVID-19 infection
2. Burnout or fatigue related to handling the pandemic among the front liners.
3. Other types of fatigue which the discussion in the article did not discuss the demotivation to follow recommended protective behaviours.

We imported the search results into Mendeley®, de-duplicated them based on title, and manually double-checked the automatically identified duplicates. After that, the duplicates were identified and excluded. In order to keep track of each excluded journal article, a spreadsheet was used to document the reasoning for exclusion based on exclusion criteria. The search followed the PRISMA extension for scoping reviews and the PRISMA-ScR checklist (24,25).

Two reviewers (A and MR) carefully went through the articles identified. The information was extracted separately by the reviewers and then cross-checked. Any disputes were discussed with a third reviewer. Consequently, from 2,558 searched, 31 articles were included to be assessed for eligibility after the title and abstract screening using the keyword stated. The summary of study selection was presented in Figure 1.

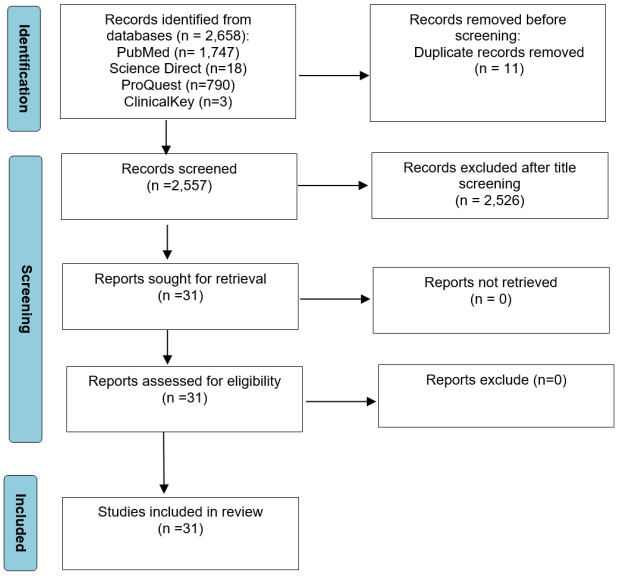

Figure 1: Summary of the study selection

Charting the data

The parameters extracted from the materials for charting were characteristic of the study, including the year of publication, country of the study, types of study, and the number of samples, topics discussed, results and conclusion were also analysed and documented. These were then analysed respectively to answer the objectives of the review.

Collating, summarising and reporting the results

We produced tables: the distribution of studies geographically, the research methods adopted, the objective and the summary of finding included in the review. We then summarised, reported and discussed the finding of the included review in six sections:

1. The definition of pandemic fatigue
2. The prevalence of pandemic fatigue in many countries worldwide
3. The causes of the fatigue
4. The consequence of the fatigue
5. The pattern of obeying instruction
6. Government policy to overcome the problem of pandemic fatigue.

RESULTS AND DISCUSSION

A total of 2,558 articles were found in the systematic

search. After screening all the articles, a total of 31 articles fulfilled all the criteria. The summary of these articles is presented in Table III. The table shows that most articles are narrative and opinion types of cross-sectional study (14 citations) and (11 citations) with two (2) from analysis type and one citation of the following types: editorial opinion, policy paper, observational, questionnaire development and analysis.

As for the cross-sectional study type, the sample size varies in the number of respondents, ranging from 7 to 238,797 due to each study's different methodologies. The studies were done mainly in Japan and Taiwan and one from Indonesia. The editorial, narrative and opinion-based review largely discussed on the following contents; i) the importance of tackling PF in the community or the specific impacted vulnerable group, ii) its negative consequences, and iii) suggested recommendation to the government for tackling PF. Most of the narration and opinion-based articles were done in the USA, followed by the United Kingdom and others. The opinion given was variable in terms of the focus. Interestingly pandemic fatigue terminology has been interpreted in many ways, whereby most claimed that the pandemic fatigue situation could cause serious detrimental effects to economic and human health. The rest mainly discussed that fatigue should be identified and tackled accordingly, otherwise, the cases would

Table III: Characteristics and findings of included studies

Author, year	Country	Study design	n	Topics discussed/ study aim(s)	Result/ conclusion
Al-Tammemi et al. (2021) (26)	Jordan	Editorial opinion	-	PF is acknowledged as a factor which impede the Jordan government to fight COVID-19.	The government should: • identify the PF and act hand in hand with the people to ensure better outcome with less cases and no more waves of pandemic. • strengthening the government public partnership for a successful, solid, and effective public health response.
Elia & Vallelona (2020) (27)	Italy	Narrative review & opinion based		Author concerned that healthcare workers in Italy will go into 'pandemic consumption' (too tired physically and mentally)	This article wants healthcare workers to be looked after and authorities should improve the working conditions especially of the healthcare workers.
Harvey (2020) (28)	United Kingdom	Narrative review & opinion based	-	Discussion is behavioural fatigue a real phenomenon	Behavioural fatigue is either a naıve construct or a myth that arose during the development of policy designed to tackle the COVID-19 crisis.
Ilesanmi et al. (2020) (29)	Africa	Narrative review & opinion based	-	PF response in Africa: causes, consequences, and countermeasures in Africa was illustrated	• Increased funding for enhancing the COVID-19 outbreak response. • Public vigilance on COVID-19 needs to be reinvigorated through behavioural change communication. • Support systems and social protection through increased provision of monetary and consumable palliatives.
Koh et al. (2020) (30)	Taiwan	Narrative review & opinion based	300	Repeated messages reminding to obey SOP had caused messaging fatigue.	• Important to recognise potential public health communication related messaging fatigue. • Develop efficient time frame for the messaging and its intent. • Focus on target groups with adaptable communication tools and evolve the messaging with changing circumstances.
Mahase (2020) (31)	United Kingdom	Narrative review & opinion based	-	Opinions regarding the UK government delayed the lockdown was discussed.	Behavioural fatigue is an ill-defined term, which for some had blamed the UK government to delay the lockdown over the fear of PF.
Cinar (2021) (32)	United Kingdom	Narrative review & opinion based		Discussion pertaining to the attributes given by the pandemic to cause fatigue among dental care providers.	5-staged Resilience and Agility model has been recommended and the need for the health care providers to reenergize to overcome the fatigue. The key feature is to improve systematically through 'One for All' approach.
Murphy (2021) (33)	Ireland	Narrative review & opinion based	-	Consequences of PF in Ireland	The author has delineated the scenario about how the covid-19 has impacted the live and livelihood and has recommended strategies to combat the pandemic in Ireland.
Pearson (2021) (34)	USA	Narrative review & opinion based	-	Discussion about the impact of COVID-19 pandemic on nursing profession	There was evidence that nursing suffered the consequence from the pandemic, making some left the job due to the burden they were impacted.

Table III: Characteristics and findings of included studies (continued)

Author, year	Country	Study design	n	Topics discussed/ study aim(s)	Result/ conclusion
Reicher & Drury (2021) (35)	United Kingdom	Narrative review & opinion based	-	The impact of PF in England and Scotland and what causes the non-adherence.	Nonadherence is a matter of practicality, not psychology. Additional to behaviour, structural and other practical context need to be taken into consideration, for adherence to COVID-19 regulations.
Sood & Kalra (2021) (36)	Not stated	Narrative review & opinion based		Discussion on the definition of PF, causes, why it causes the problem, and the recommendation	Recommendation: • make people to understand and learn ways to have socially distant interactions. • create awareness of low and high-risk activities (the concept of 'acceptable risk). • suggestions on living with reduced risk of transmission should be made. • government needs to encourage practice of safety measures through effective strategic communication and propagate accurate scientific information via social media platforms. • reopening of public places needs to be done in phases as the vaccines are rolled out. • engaging people from the general population to deliver messages and promote protective behaviours will act as a social norm
Madziva et al. (2022) (37)	Africa	Narrative review & opinion based	-	Discussion on how to fight COVID-19 PF and complacency in Zimbabwe	There is a need for: • repeated reminders to obey restriction. • providing continued COVID-19 IEC messages on the various communication platforms. • consistently enforcing safety guidelines. • fighting vaccine hesitancy, PF and complacency are critical elements of COVID-19 control.
WHO (2020) (17)	Not stated	Policy paper	-	Policy framework for supporting pandemic prevention and management.	• Member States are reporting signs of PF in their populations. • The framework is intended to support pandemic prevention and management. • Four key strategies for governments to maintain and reinvigorate public support for protective behaviours. • 10 steps were offered for decision-makers who are seeking recommendations for concrete actions.
Shearston et al. (2021) (38)	USA	Observational study	-	Aimed is to determine the changes in social distancing pattern using traffic congestion data.	While traffic decreased sharply following the onset of the pandemic and implementation of response policies, levels were already rebounding almost two months before stay-at-home orders (NY on PAUSE) were lifted on June 8. This is proxy evidence of social-distancing fatigue in Manhattan, New York City.
Haktanir et al. (2022) (39)	Turkey	Cross-sectional	516	To investigate PF and its relations to fear of coronavirus, intolerance of uncertainty, apathy, and self-care.	34.4% of the participants reported that the level of COVID-19-related precautions they take have decreased in comparison to measures they took at the onset of the pandemic. Fear of coronavirus, intolerance of uncertainty, and apathy as mediated by self-care predicting PF demonstrated acceptable to excellent goodness-of-fit indices.
Majumdar et al. (2020 (40)	India	Cross-sectional	528	To survey the impact of the lockdown – home confinement and social distancing – caused by the COVID-19 pandemic on the wellbeing and lifestyle behaviours.	More extensive feelings of sleepiness, with increased daytime nap duration, and depressive symptomatology were noted. Moreover, the chronic stress of living through a pandemic led to a host of physical symptoms, like headaches, insomnia, digestive problems, hormonal imbalances, and fatigue.

Table III: Characteristics and findings of included studies (continued)

Author, year	Country	Study design	n	Topics discussed/ study aim(s)	Result/ conclusion
Ball & Wozniak (2022) (41)	USA	Cross-sectional	268	To examine COVID-19 message factors that may be linked to nonadherence to CDC recommendations via the experience of reactance.	• Perceived freedom threat toward a COVID-19 message was predicted positively by message fatigue and negatively by issue importance. • Greater perceived freedom threat was linked to greater reactance, which in turn was associated with lower levels of adherence to hygiene- and social-related COVID-19 preventive behaviour. The negative association between reactance and social-related adherence was stronger than that between reactance and hygiene-related adherence.
Bunevicie et al. (2021) (42)	Lithuania	Cross-sectional	1,036	Examine the predictors of interest and avoidance of COVID-19 news in Lithuania.	• Decreasing/diminished interest and avoidance of news about COVID-19 are common. • Are associated with younger age, greater post-traumatic stress symptoms, less fear of COVID-19 and less frequent use of healthcare professionals for COVID-19 information.
Franzen & Wuhner (2021) (43)	Switzerland	Cross-sectional	400	To investigate the change in attitudes towards the COVID-19 measures and the change in compliance behaviour between the first and second lockdowns.	• High acceptance of and compliance with the Covid-19 measures during the first lockdown. • Acceptance and compliance behaviour decreased substantially during the second lockdown. • The compliance behaviour is largely driven by the perception of how others behave and by the acceptance of the COVID-19 measures.
Gao et al. (2021) (44)	Hong Kong	Cross-sectional	31,332	To explore the attenuated impact of reported avoidance behaviours adherence on the transmission of COVID-19 in Hong Kong.	Reduced adherence to voluntary avoidance behaviours due to PF but continued adherence to regulated avoidance behaviours.
Gratz et al. (2021) (45)	USA	Cross-sectional	430	Examined the relations of pseudoscientific and just world beliefs, generalized and institutional trust, and political party affiliation to adherence to COVID-19 social distancing guidelines.	• Lower governmental trust, greater COVID-19 pseudoscientific beliefs, and greater trust in the CDC associated with lower initial adherence to social distancing. • Greater COVID-19 risk perceptions and CDC trust were associated with less steep declines in social distancing over time, both Republican (vs. Democratic) Party affiliation and greater COVID-19 pseudoscientific beliefs were associated with steeper declines in social distancing over time.
Hassan et al. (2022) (46)	Iraq	Cross-sectional	819	To investigate the level of lockdown-induced fatigue and its correlation with personal resilience and coping skills among university students in Iraq.	Students indicated a high level of lockdown fatigue with a mean score of 33.48 out of 50. Fear of personal safety and the wellbeing of the family was the most fear expressed by the students. The ability to go through stressful times and unpleasant events was the most common worry among the students. Female, urbanised, and science field students were the most students who suffered from lockdown-induced fatigue. Positive coping behaviours and personal resilience were significantly correlated with decreasing fatigue levels during the lockdown period.
Labrague (2021) (47)	Philippines	Cross-sectional	255	To examine the influence of PF on clinical nurses' mental health, sleep quality and job contentment, with resilience as a mediator.	Clinical nurses who received a COVID-19 vaccine and those who perceived sufficient staffing in their units reported lower levels of PF. Resilience reduces the effects of PF on clinical nurses' mental health, sleep quality and job contentment.
Labrague & Ballad (2021) (48)	Philippines	Cross-sectional	243	To examine the levels of lockdown-induced fatigue and its association with personal resilience, coping skills, and health in college students	College students experience moderate levels of fatigue during the mandatory lockdown period. Increased personal resilience and coping skills were associated with lower levels of lockdown fatigue.

Table III: Characteristics and findings of included studies (continued)

Author, year	Country	Study design	n	Topics discussed/ study aim(s)	Result/ conclusion
MacIntyre et al. (2021) (49)	Australia, United Kingdom and USA	Cross-sectional	2,343	To determine patterns of mask wearing and other infection prevention behaviours, over two time periods of the COVID-19 pandemic.	Pandemic mitigation measures were widely reported across all cities but decreased between March and July 2020. PF was more common in younger people. Cities with mandates had higher rates of mask wearing. Masks did not result in a reduction of other hygiene measures.
Morgul et al. (2021) (50)	Turkey	Cross-sectional	4,700	Aim to investigate the association between the COVID-19 pandemic and psychological fatigue in Istanbul,	64.1% of participants were psychologically fatigued. There was a significant difference between PF with age, educational level, occupational status, place of residence and number of family members.
Nitschke et al. (2021) (51)	Austria	Cross-sectional	902	To examine the relationship between individuals' levels of social connectedness during lockdown and self-reported stress, worry, and fatigue.	Greater social connectedness during the lockdown period was associated with lower levels of perceived stress, as well as general and COVID-19-specific worries. Negative relationship between fatigue and social connectedness, which was mediated by feelings of stress, general worries, and COVID-19-specific worries—respectively, indicating that individuals with smaller network sizes, who were highly distressed during the pandemic, were also likely to report feeling more fatigued.
Petherick et al. (2021) (52)	Canada, Denmark, Finland, France, Germany, Italy, Japan, Netherlands, Norway, Singapore, South Korea, Spain, Sweden and United Kingdom	Cross-sectional	238,797	Examine whether there was a gradual reduction in adherence to protective behaviours against COVID-19 from March through December 2020.	Changes in adherence were empirically meaningful and geographically widespread. A low-cost and habituating behaviour (mask wearing) exhibited a linear rise in adherence. High-cost and sensitizing behaviours (physical distancing) declined, but this decline decelerated over time, with small rebounds seen in later months. Reductions in adherence to physical distancing showed little difference across societal groups but were less intense in countries with high interpersonal trust.
Teng-Costa et al. (2022) (53)	Philippines	Concept analysis	-	Aims to impart knowledge and recognize the PF of healthcare professional, especially nurses.	Exposure to infection, restriction, mortality, relationships with co-workers, employers and public, PPE/supplies, and nursing shortage mental health was seven significant contributing attributes of PF, especially among healthcare workers.
Brodeur et al. (2021) (54)	Europe and America	Data analysis using Google Trends data	-	To test whether COVID-19 and the associated lockdowns implemented in Europe and America led to changes in well-being related topic search terms.	A significant increase in searches for loneliness, worry and sadness, while searches for stress, suicide and divorce on the contrary fell.
Cuadrado et al. (2021) (55)	Spain	Questionnaire development	896	The need to have valid questionnaire to assess PF	The instrument had been developed and can be of utility for professionals and researchers to assess PF, a variable that can affect the adoption of protective measure to avoid catching and spreading the virus.

escalate due to the demotivation of the people to obey the regulation put in place to halt the infection's spread.

The main objective of the scoping review was to discuss important issues related to pandemic fatigue from the available literatures, hence this may make us understand the direction through an evidence-based approach so that essential measures could be suggested in assisting better management of pandemic fatigue. Considering the results from cross-sectional studies, pandemic fatigue is prevalent, with the great concern that there is an increase in non-compliance with self-health control towards COVID-19 as the cases remained escalated. The detailed discussion for each research question was discussed below.

What is the definition of pandemic fatigue?

The WHO has defined pandemic fatigue as physical and mental tiredness that occurs during a pandemic resultant from the interruptions in the usual routines or norms of an individual due to measures implemented to decrease virus transmission. It causes demotivation to follow recommended protective behaviours, and it emerges gradually over time and is affected by a number of emotions, experiences, and perceptions (17). Many studies have acknowledged the existence of the term (36). The most fear and worrisome consequence which significantly could set the public health at risk is that it has the potential to demotivate people to follow recommended protective behaviours resulting in the non-adherence to the standard operating procedures

(SOP). It is a real phenomenon, and this has been reported by many (41). The authors in the UK has stressed that non-adherence is a matter of practicality rather than psychology. Nonetheless, adherence to COVID-19 regulations, is believe not only depend on the behaviour but structural and other practical contexts need to be considered as well (35).

What are the causes of the fatigue?

The causes of the fatigue have been largely discussed in opinion-based articles. Basically, the cause are similar throughout the world. Most has blamed to the prolonged duration of the pandemic due to being unclear as to when it will end. This consequently made them feel bored and longing to live like the pre-pandemic era. In fact, the domain or keyword of "bored" has been implicated in the questionnaire development to assess PF by Cuadrado et al. (55) called instrument—the Pandemic Fatigue Scale (PFS). He developed a short, reliable, valid, and gender-invariant in order to assess the PF. During the development of that instrument, he had identified two factors which were 1) people's demotivation in continuing to follow the recommended protective behaviours (neglect) and 2) people's boredom regarding the pandemic-related information (boredom). These two factors were based on a few related studies (17, 33, 35, 46).

Pandemic fatigue can be explained through the theory of human physiology as well. Human body releases adrenaline at the beginning of restriction being imposed to combat the pandemic, thinking that it could be temporary. The hormone helps an individual to stay put and obey rules and regulation. Unfortunately, the pandemic continues and drags on and this poses the adrenaline to continue working, which eventually became exhausted (33). Other than that, the cause of PF can be explained by the substantial reduced role of social, environmental, and personal factors, as well as the overloaded message on COVID-19 news (30, 56).

However, Harvey (28) did not believe that behaviour fatigue really did exist. For instance, he claimed that the UK government had made an excuse by saying that behaviour fatigue could set in earlier if mitigation process of imposing lock down was imposed quickly During that time, the UK government believes that if the standard operating procedures (SOP) was implemented too soon, people could become tried to obey SOP later, making the cases to escalate even more. In arguing that implied there is no strong evidence to establish the link between PF with behaviour hence he has the opinion that behavioural fatigue is either a naɪve construct or a myth that arose during the development of policy designed to tackle the COVID-19 crisis (28). His contrasting ideas was further supported by Reicher & Drury (35) where he speculated that the non-adherence does not involve the psychology component. In other word, the act of non-adherence to COVID-19 regulations does not coin only to the behaviour alone (i.e pandemic fatigue) but it is also contributed due to other factors as well such as structural and other practical factors.

What is the prevalence of pandemic fatigue in many countries worldwide?

The prevalence of pandemic fatigue in many countries are variable and it depends on the study type, sample population, study timing, and how the data was collected. For example, it has been reported that the prevalence of PF in Turkey population was ranging from 56.4% to 64.1% (50) and that of Hong Kong (44) and Xi'an, China (57) was at 43.7% and 49.0% respectively. One of the reason for the difference was because of the timing of the study, whereby some were conducted at the beginning and some were in the middle of the pandemic apart from other factors mentioned above.

From the available studies, age and type of occupation, among others play significant role in getting the risk of the PF. Pandemic fatigue was reported to be more common among younger people (42, 46, 50) and in cities that mandate mask wearing (49). As for occupation, a study in the Philippines identified that working as nurses posed a high risk of PF (53). Nurses are prone to developing pandemic fatigue due to their nature of work and the additional burden that COVID-19 has brought in. In fact, there was evidence that nurses suffered the consequences of the pandemic, causing some to leave their jobs due to the burden they endured (34). Dental staff is not an exception as evidenced by similar consequences (32). With regards to gender, there was inconsistency in the findings, where some studies reported females were at a higher risk of PF, but some reported the opposite (50).

What is the consequence of pandemic fatigue?

The consequences of the PF are mainly discussed in opinion based or cross-sectional study design types. The worst and worrisome consequence of PF was the fear that the COVID-19 cases had risen dramatically due to people were tired in keeping with the strict regulations and procedures put into place to contain the viral spread. Almost all countries had implemented stringent strategies to fight against the illness (26). The need to adhere to social and physical distancing has resulted to Zoom fatigue as most meetings needed to be conducted online (58). Zoom fatigue is defined as tiredness, worry or burnout associated with the overuse of virtual platforms of communication, particularly videotelephony (58). It affects the health and psychological well-being of an individual (59, 60). Other examples of the consequence of pandemic fatigue is messaging fatigue. A study was conducted in Taiwan has reported that repeated messages reminding to obey SOP had caused messaging fatigue (30).

A cross sectional study was conducted to find an association between PF and psychological disturbance.

They found that 64.1% of participants were psychologically fatigued as a mental health issue among the population of Istanbul, Turkey (50). In another study, the pandemic was reported to cause media fatigue (42). The cross-sectional study involving 1,036 which was conducted in Lithuania reported that diminished interest and avoidance of news about COVID-19 are common and are associated with younger age, greater post-traumatic stress symptoms, less fear of COVID-19 and less frequent use of healthcare professionals for COVID-19 information. Meanwhile, another study reported that 37% of participants were losing interest in COVID-19 news, 32% had started avoiding COVID-19 news and 26% had stopped following news about COVID-19 (42). Mask fatigue was also reported due to the prolonged use of mask during the pandemic. It is defined as the lack of energy that accompanies, and/or follows prolonged wearing of a mask (36).

In the same aspect, pandemic fatigue has been thought to cause the rebound in traffic congestion few months after strict stay at home order was implemented in the USA. This is the evidence found by an observational study using real-time crowd-sourced traffic data in a few regions in the country (38). While traffic decreased sharply following the onset of the pandemic and implementation of response policies, levels were already rebounding almost two months before stay-at-home orders (NY on PAUSE) were lifted on June 8. This is proxy evidence of social-distancing fatigue in Manhattan and New York City. The compliance behaviour is largely driven by the perception of how others behave and by the acceptance of the COVID-19 measures (43). Hence identifying the people's perception and knowledge is utmost important.

Many studies have acknowledged the detrimental effects brought about by the pandemic fatigue (36). An author was concerned that healthcare workers in Italy will go into 'pandemic consumption' where they are too tired physically and mentally (27). Therefore, a suggestion was put forward to the government to ensure the physical and the mental health of their healthcare workers to be looked after and authorities should improve their working conditions. During the pandemic, various sources had reported how the health care workers were severely stretched, burnt out and overworked in combating the high transmissibility of the virus (61).

What is the pattern of obeying the instruction?

It is evident that people start to feel PF a few months after national lockdown was put in place in Canada (51), a few weeks to the fourth month of immobility restriction in Western countries (54) as well as in other regions including Philippines, India and Saudi Arabia (40, 48, 62). Furthermore, in this scoping review, we observe that a few studies demonstrate adherence to SOP had diminished as the time prolonged. For example, a study reported there was a gradual reduction in adherence to protective behaviours against COVID-19 from March through December 2020, as hypothesized in expectations of fatigue (52). MacIntyre et al. (49) also found that from March to July 2020, there was a decreasing trend in the most common pandemic mitigation behaviour such as avoiding public areas, hand hygiene, wearing masks and distancing conducted in five cities: Sydney and Melbourne, Australia; London, UK; and Phoenix and New York, USA. While respondents expressed high acceptance of and compliance with the COVID-19 measures during the first lockdown, both acceptance and compliance behaviour decreased substantially during the second lockdown (43).

Crane et al. (63) had analysed national survey responses in the USA collected between April and November of 2020 about adherence to COVID-19 rules like social distancing, frequent handwashing, and wearing a mask. The adherence dropped from 70% in April 2020 to 50% in June 2020. It was observed that this kind of trend was consistent across other region in the country. Another study observed a reduction in the Hong Kong population compliance with protective policies adherence by about 1-5%, between the 3rd and 4th pandemic waves, indicating that this was due to the PF which had impacted their people (44). This finding has resulted in the author suggesting the government to continue remind the public to maintain effective pandemic control. Otherwise, it would lead to prolonged disease circulation with increased infections that would undermine the effort to end the pandemic.

How does the government overcome the problem of pandemic fatigue?

Many efforts in different countries have been suggested in overcoming PF (37). Identification of the problem remained the ultimate goal. The task in overcoming the PF should be carried out by everyone in the country, and not just the government. A paper in Jordan has suggested that the government should identify the pandemic fatigue and act swiftly, hand in hand with the people to ensure a better outcome with lesser cases and expecting no more pandemic waves. Strengthening the government-public partnership is a cornerstone for a successful, solid, and effective public health response (26). In Ireland, many recommendations were put forward. This includes easing the restrictions in a cautious manner so as not to trigger an escalation of cases. The key factor is to ensure the cases were in a decreasing trend. All parties need to be prepared, especially those dealing with patients and cases (33). In Africa, a broader approach in dealing with PF was suggested; (i) Funding for enhancing the COVID-19 outbreak response should be increased (ii) Public vigilance on COVID-19 needs to be strengthened through behavioural change communication (iii) Support systems and social protection through increased provision of monetary and consumable palliatives should be established (29). The need for the health care providers to reenergize to overcome fatigue has been

advocated too among dental staff (32).

Importantly, a well renowned body in the world health, WHO, has established a policy paper which aims at handling the PF (17). Four key strategies for governments to maintain and reinvigorate public support for protective behaviours and 10 steps were suggested for decision-makers who are seeking recommendations for concrete actions. The document provides a framework for the planning and implementation of national and subnational opportunity strategies to maintain and provide a boost to the public in mitigating COVID-19. The framework is intended to support pandemic prevention and management. They proposed four key strategies for protective behaviours; (i) Understand people (ii) Engage people as part of the solution (iii) Allow people to live their lives but reduce risk and (iv) Acknowledge and address the hardship people experience.

In addition, steps to increase personal resilience and coping skills should be put in place as these elements were shown to be associated with lower levels of PF (46-48). Pandemic fatigue can be prevented initially by studying the underlying cause of fatigue and formulating strategies for people to overcome pandemic fatigue. For instance, it can be prevented by following the established guidelines and support from the family and the nurses' institution. Furthermore, nurses can develop suitable strategies in order to curb fatigue (53).

At the point of this write up, as the incidence of COVID-19 is here to stay, the pandemic fatigue and its related issues remained unprecedented. The strategies were volatile and could undergo changes depending on the incidence and prevalence being reported. However, the methods should be similar whereby all levels regardless which countries, the government and the people should play role to ensure the PF does not destroy the living and society.

Limitation

There are a few limitations of this review. Firstly, it only includes material available through the author's academic databases. Therefore, manuals and online articles published outside of these databases were not included. Secondly, the review only included published articles using selected key term until early March 2022. These two factors could have compromised the amount of information in this review. Nonetheless, despite these limitations, it is hopeful that the scoping review may adequately highlight the important facts and issues being discussed by the available articles in regard to pandemic fatigue.

CONCLUSION

This review has highlighted some key issues and challenges related to pandemic fatigue from the available literatures. People across the globe become exhausted as they need to continue living with the strict operating procedures to ensure the cases of COVID-19 remain controlled. The pandemic fatigue consequences are too detrimental when it demotivates people to obey the instructions, and consequently, complacency sets in. The review concluded that identifying pandemic fatigue as early as possible is absolutely prudent in keeping people to continue following measures in mitigating the pandemic. In addition, people and their government should hold hands to ensure that pandemic fatigue can be avoided. If, however it has already occurred, measures to reduce its severity should be taken with great care. Many countries have understood this situation and are doing their best to tackle the issue. The strategy suggested by WHO is an excellent example that should be implemented.

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