

# A Systematic Review of Research Developments in Mass Psychogenic Illness

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**Abstract.** This study explores the development of research on mass psychogenic illness (MPI) over recent decades. The literature review was used as the research methodology for this study, and dozens of published case reports and studies are reviewed in this paper. First, the paper reviews past researchers' general recognition of mass psychogenic illness. The paper includes the two subtypes of mass psychogenic disorders, 'mass anxiety hysteria' and 'mass motor hysteria', as well as the characteristics and common symptoms of the outbreak of mass psychogenic illness and the suspicion of the existence of mass psychogenic illness by some scholars. Secondly, historical cases of mass psychogenic illness outbreaks are reviewed in chronological order, from the Middle Ages through to the 21st century. Thirdly, new trends in the development of mass psychogenic illness and a new type of mass psychogenic illness, MSMI, proposed by researchers are reviewed. Finally, two important studies from the past decade are reviewed. The findings of two studies, the inducibility of mass psychogenic illness and hypnotizability, an important predictor to the emergence of cases of mass psychogenic illness, are also presented. Besides, some implications for future research into mass psychogenic illness are given through the review.

**Keywords:** Mass psychogenic illness; Mass hysteria; Tourette-Like syndrome; Mass social media-induced illness; Hypnotizability.

## 1. Introduction

Although mass psychogenic illness (MPI) has not occurred often in human history, leading it difficult be certified as a common psychological disorder. Likewise, because of the lack of statistics and information on the frequency of episodes of massive psychogenic illness, clinical psychology practitioners have only been able to diagnose it using exclusionary methods [1]. However, in the recent few decades, mass psychogenic illness is no longer a very rare phenomenon in society. It occurs more often than it has been recorded, which could cause severe disruption to the operation of emergency services, public health systems and environmental safety agencies; schools and workplaces affected by MPI outbreaks are often closed for days to weeks to cope with the outbreak [2,3]. In addition, mass psychogenic illness can sometimes produce even more serious consequences, such as the massive outbreak of psychogenic illness among the staff of the US Embassy in Cuba between 2016 and 2017, which led to tensions between the US and Cuban governments [4]. Hence, the mass psychogenic illness still needs to be demystified. This article will use a literature review as a research method to explore the development of research on mass psychogenic illness in the recent few decades. Case reports and studies and experiments from the last two to three decades of research on mass psychogenic illness will be reviewed and summarised in this article for the purpose of gaining an initial understanding of mass psychogenic illness, while recommendations for future research will be given based on the literature.

## 2. General recognition of mass psychogenic illness

Mass psychogenic illness is known by many other alternative names; it may also be referred to as mass sociogenic illness, epidemic hysteria or mass hysteria.

In 1987, Simon Wessley proposed two separate types of mass psychogenic illness, which are 'mass anxiety hysteria' and 'mass motor hysteria' [5]. The former type, mass anxiety hysteria, is relatively evanescent, usually lasting about a day, and patients usually exhibit sudden and extreme anxiety after

becoming aware of or receiving information or indication that is perceived as a false threat. A very distinctive feature of the second type, mass motor hysteria, is that the case lives in an environment where there are pre-existing conditions of extreme stress, for instance, the death of a classmate or a social culture that is filled with fear of environmental toxins [6,7]. Individuals living in such environments have the typical characteristics of a slow build-up of stress, often resulting in dissociation, histrionics and altered psychomotor activity after strikes of mass psychogenic illness. However, later scholars in qualitative studies have proposed the questionable dispute that there is some overlap in the dissociative features of the two different types, which weakens the argument for the existence of two separate syndromes of massive psychogenic illness [8].

Mass psychogenic illness generally occurs in cohesive groups; the cohesive group can be understood as a group of people who share a common belief about the possible symptoms caused by an organic disease, often including nunneries, boarding houses, schools, prisons and religious organisations [4,9,10]. In these groups, the spread of mass psychogenic illness could be very efficient, often spreading on a relatively large scale by the time they draw attention of public health agencies.

There is a common consensus among researchers that mass psychogenic illness is classified as a social phenomenon that strikes otherwise healthy groups and that it often occurs in people who have experienced and are experiencing high levels of psychological, social or political oppression [11]. Moreover, some scholars suggested that people affected by mass psychogenic illness experience 'real' symptoms rather than imagined or 'just in their heads' symptoms [12].

The common symptoms that may occur during the onset of a mass psychogenic illness episode were summarised in an article by Timothy Jones in 2000. Patients suffering from mass psychogenic illness usually present with headache, dizziness or light-headedness and nausea, abdominal cramps or pain, cough, fatigue, drowsiness, or weakness and sore or burning throat etc [13]. In addition to this, a cross-sectional study conducted in recent years in Ethiopia, Africa, based on community structures, suggested that local cases of mass psychogenic illness also exhibit symptoms such as tremors, convulsions, fainting, vomiting, palpitations, anxiety, pruritus, watery eyes, communication difficulties, uncontrollable laughter and cautious trance [14]. Hence, different from collective delusional disorders, the mass psychogenic illness usually exhibits specific physical symptoms that could be observed; also, researchers have not even been able to identify the specific infectious contagion that carries out the epidemic transmission at this time period [15, 16].

In addition, Robert E. Bartholomew and Simon Wessely suggested that investigators in public health agencies should identify most or all of eight relevant characteristics, defined as a combination of symptoms and conditions, when investigating the presence of mass psychogenic illness [2]. These specific characteristics are: the patient exhibits symptoms that cannot be identified as having a plausible organic basis; the symptoms of the patient are usually transient and benign; the onset and recovery of the symptoms of the patient are relatively expeditious; outbreaks of the mass psychogenic illness are usually in a disjunct group; patient sometimes could manifest the profound anxiety; the symptoms can be contaminated by visual, auditory or verbal conversation; the symptoms contagion follows the age scale, generally starting with older or higher status individuals; and lastly, a greater number of female individuals were observed more likely to be infected [2]. These characteristics could help medical investigators to make a preliminary diagnosis of the presence of the mass psychogenic illness before the results of tests for environmental correlates are available. However, despite the positive contribution of these characteristics to the initial diagnosis of mass psychogenic illness, MPI remains controversial and has been criticised by many scholars. This controversial situation arises because such a diagnosis is often considered to be an exclusionary diagnosis, which lacks scientificity [2]. Furthermore, there is an element of exception to all of these well-identified characteristics [3]. Therefore, there is still no definitive diagnosis of the pathology of massive psychogenic disorders that can be accepted by the researchers.

Finally, the existence of mass psychogenic illness has been a controversial topic in investigators' reports. Robert E. Bartholomew suggested that mass psychogenic illness has not been publicly accepted as an actual mental disorder due to the ambiguity of the frequent contradictory hypothesised

causative mechanisms and symptom criteria for diagnosis [17]. He also suggested that studies of behaviours that were classified as abnormal and strange by Western cultural standards, such as dancing manias and demonic possession, might have been misunderstood. Since the investigators were Western-educated researchers at the time, they used the criteria of disease scrutiny learned from Western cultural standards to understand these social phenomena as unconventional and bizarre to themselves. The act of these researchers reflects the desire of the Western psychiatric researchers to generalise their own school of thought on the universal illness model of mental disorders, while selectively ignoring differences in various social contexts [18]. Hence, future psychologists may need to consider additional factors when studying the mass psychogenic illness, such as sociocultural differences, and perhaps more anthropological approaches can be sought to solve the mystery of how mass psychogenic illness emerge.

### 3. The development of mass psychogenic illness

The existence and occurrence of mass psychogenic illness has been documented and depicted in various types of cultural and social contexts for over 600 years, with the earliest reports of mass psychogenic disorders probably dating back to medieval dance manias such as the St. John's dance and tarantism [19]. Before human society enter the more developed twentieth century, most cases of mass psychogenic illness are mass motor hysteria, and patients are usually found in groups with long exposure to serious religious or academic moral regulations [2]. For instance, during the medieval era, there were dozens of cases of mass motor hysteria among groups of nuns in monasteries in parts of Europe. The causes of mass motor hysteria were twofold: firstly, the extremely strict Christian canon rule that was applied in these convents, and secondly, the popular belief in the existence of witches and evils in the medieval socio-cultural context of the era. The mass motor hysteria among the nuns was considered by investigators of the period to be a symptom of demonic possession. In medieval outbreaks of mass motor hysteria, affected individuals often exhibited the typical characteristics of histrionics and role-playing, and these rebellious nuns who appeared to rebel against the strict Christian canon often used vulgar language or profanity to simulate sexual intercourse, among other things [20]. Other symptoms of demonic possession include fainting, convulsions, asphyxiation, vomiting and paralysis, among the more famous cases being the Salem witch trials of 1692. The opinion of recent scholars is that mass motor hysteria might result in severe regulations and the long accumulation of anxiety, which leads to dissociative experiences and excessive suggestibility. The content of the delusions produced by the patient during the strike of mass psychogenic illness is reflective of the zeitgeist of the era [2].

Over two hundred years between the early 18th and early 20th centuries, human society gradually entered the phase of the industrial revolution. As the industrial revolution progressed and developed, groups of workers working in highly oppressive working conditions and weak or even non-existent protection from the labour union were struck by mass motor hysteria and reported as cases of the mass psychogenic illness [2]. These reports of mass psychogenic illness usually took place in factories, with documented reports appearing in The United Kingdom, France, Germany, Italy and Russia. In the latter half of the 20th century, no similar reports of mass motor hysteria were recorded in the Western world, it could be considered to be due to the rapid growth of labour unions and the strict laws and regulations issued by governments to protect workers' safety and health conditions [2].

In the meantime, mass motor hysteria also strikes in many European schools during this period, particularly in Germany, Switzerland and France, where extremely strict academic discipline is applied, which investigators thought to have been the main inducement of the outbreaks [2]. However, the outbreaks of mass motor hysteria in some schools during this period appear to have been relatively small in scale, short-lived, and not thought to be related to strict academic regulation. For example, in 1907 there was a case of arm paralysis among girls at a London school: several girls, after witnessing the return of a girl with polio in her left arm who had recovered from a fracture in her right arm, experienced severe pain in their left arm or felt paralysed and unable to use their left arm for

several days [21]. To date, in the second half of the 20th century till now, reports of mass psychogenic illness were mainly found in developing or countries dominated by religious belief such as Malaysia, Nepal, India and Africa [22,23].

In addition to this, the hypothetical presence of toxic gases or the shadow of war, vaccination campaigns, etc. can also lead to outbreaks of mass psychogenic illness. To date, most studies on mass psychogenic illness have been conducted on basis of post-observational reports of related events mentioned above [24]. In their article, Bartholomew and Wessely speculate that there is a concern that public health facilities could be quickly overwhelmed by anxious people following a biochemical, chemical or even nuclear attack; people may be overwhelmed by psychological stress rather than just physical hazards [2]. Moreover, the early symptoms of individuals exposed to a large-scale psychogenic strike are difficult to distinguish from those of individuals who have actually been exposed to the dangerous agent [13]. For instance, during the Gulf War, a missile used by the Iraqi military was considered to carry biochemical attack agent. Despite this was not true, forty percent of the population in the vicinity of the blast area thought they were experiencing physical breathing problems [2]. In 2017, some employees of the US Embassy in Cuba reported numerous physical symptoms attributed to "sonic attacks" used by the Cuban government, which at the time intensified tensions between the US and Cuba [4]. Some researchers have argued that the symptoms experienced by these employees should be psychogenic in nature. Nevertheless, a neuroimaging-based study advised that the symptoms should be the result of some plausible organic and non-psychogenic factors [25].

Therefore, future researchers should continue to focus on the early identification of strikes of the mass psychogenic illness. Once the attack of the mass psychogenic illness can be recognised at an early stage, public health administrators could have enough time to contain the outbreak to a smaller scale and with less impact.

#### **4. New trends to spread of mass psychogenic illness**

Prior to the promulgation of social media and the internet, the spread of mass psychogenic illness was largely confined to certain fixed sites and locations, such as schools, factories or religious institutions [2]. Nevertheless, with the rapid growth of mass media in the last two decades, the spread of mass psychogenic illness has begun to develop and it might be able to outbreak without physical proximity [26]. The condition first came to widespread attention among researchers because of a mass motor hysteria that broke out in 2011 among a group of female high school students in LeRoy, New York [27]. The girls who were struck by this mass psychogenic illness exhibited symptoms such as seizures, slurred speech and asthma, and even aphasia, and videos and news reports of their symptoms went viral on social media and the internet. Many people who watched the videos posted that they were experiencing almost the same symptoms.

In recent years, Müller-Vahl et al. have reported another similar strike of a new type of mass psychogenic illness in their article and proposed a new, more specific term: 'Mass Social Media-Induced Illness' (MSMI) to name this type of phenomenon [28]. The case report describes that starting in 2019, Jan Zimmermann, the creator of a YouTube channel, made countless movements, sounds, words, phrases and weird behaviours in the videos he posted, and claimed that these symptoms were tics caused by Tourette's syndrome. Although experts recognized from his published videos that he did have mild Tourette's syndrome, the obvious symptoms of these superfluous and bizarre behaviours are functional in nature [28]. As soon as the Jan Zimmermann video was posted on YouTube channel, it went viral on social media platforms and his channel even reached nearly 1 million subscribers in 3 months. He became the second most successful YouTube video creator in Germany that year and is extremely popular among young people. In the following two years, a large number of young patients began to seek help from specialist tic clinics, with symptoms of Tourette-Like syndrome. Although some patients did suffer from a mild form of Tourette's syndrome, experts demonstrated that the majority of cases could be definitively ruled out as tics [28].

Müller-Vahl et al. also suggest that social media platforms are the main intermediary for the spread of this phenomenon [28]. Firstly, Jan Zimmermann can be considered as the first 'virtual' index case. During the spread of MSMI, an increasing number of patients with Tourette-Like syndrome also emerged on the Internet or on television screens in Germany. Hence, the spread of relevant content in social media seems to have induced "secondary virtual" index cases, while in other countries and regions such as YouTube and TikTok, similar spreads have also occurred and led to further "virtual" index cases. Secondly, spread through social media appears to have led to further dissemination of MSMI without confined location restrictions. The typical mass psychogenic illness outbreak is usually spread in a specific site or location, and contaminated through visual, auditory or verbal conversation [2]. Whereas, due to the unique interaction mechanism of social media, where young people can interact visually, audibly or verbally without physical proximity, the spread of social media eliminates the physical proximity required for a typical mass psychogenic illness.

Due to the requirement for physical proximity for the spread of mass psychogenic illness disappears in social media, based on some recent reports, there are some arguments that these groups of young people affected by MSMI can have a considerable impact on the public health systems of individual countries and on society as a whole [26,28,29]. Meantime, it could be considered that a large proportion of young people in Generation Z need to deal with the anxiety of ecological alter and the additional anxiety and psychological distress related to family life and education resulting from the lockdown caused by the COVID-19 pandemic. Hence, experts believe that the outbreak of MSMI through social media not only represents a 'contemporary' manifestation of a motor variant of mass psychogenic illness, but it could be seen as a manifestation of a culture-bound stress reaction that emphasises the uniqueness of individual; the attention-seeking behaviours which MSMI exhibits are associated with a permanent identity crisis [28]. The international society should pay attention to this current illness caused by mass social media and train psychologists, doctors and other groups in advance so that they can effectively identify MSMI early and effectively when it strikes. Furthermore, another report that also explored the spread of MSMI in social media proposed a theoretical construct, the 'Social Media Associated Abnormal Illness Behaviour' (SMAAIB), which was hypothesised to provide a broader understanding of MSMI outbreaks through the psychological, sociological and cultural context of MSMI cases, and might provide some strategies to help maintain the mental health of affected population [26].

Overall, future researchers need to look at more aspects of this new type of mass psychogenic illness with the purpose of understanding and how to intervene or prevent outbreaks of MSMI.

## **5. Inducibility of mass psychogenic illness and significant predictor for outbreaks of mass psychogenic illness**

To date, the etiological agent and pathological characteristics of mass psychogenic illness have remained elusive, and the ethical concerns of experimentation in public need to be taken into account to design experiments. As a result, most research on mass psychogenic illness has been limited to post hoc observational reports following outbreaks of mass psychogenic illness. However, in the last decade, two studies of mass psychogenic illness can be considered ground-breaking as they have demonstrated the inducibility of mass psychogenic illness and identified important predictors for the outbreak of mass psychogenic illness respectively.

The first study was a randomised controlled experiment in which simulated biological threats and social contagion factors, two basic inducements of mass psychogenic illness, were used in experiment [24]. Three groups were created in the experiment: a no-intervention control group, a psychogenic illness induction group and a psychogenic illness induction plus media group in which participants were randomly assigned. Separate assessments of symptom intensity, heart rate and blood pressure, as well as questionnaires measuring potential risk factors for mental illness were used as measures of assessment of participants.

The results of this controlled experiment state that the latter two psycho-induced groups exhibited 11 times more symptoms of mass psychogenic illness than the control group, with no significant differences in the rates affected in the male and female [24]. Therefore, the potential for mass psychogenic illness to be induced in the public needs to be strongly concerned. Secondly, the more traumatic events and histories of depression individuals experienced during their lifetime, the higher the probability of being induced to develop the illness. Finally, it has been shown in experiments that media does not increase the occurrence of symptoms of mass psychogenic illnesses. Nevertheless, studies of disaster media exposure have shown that higher rates of media exposure are positively associated with rates of PTSD and depression, and media exposure has been reported to exacerbate the spread of mental illness in the presence of 'toxic exposure' [3, 30]. Hence, it might be able to hypothesise that the media play an important role in the spread of mass psychogenic illness, although this role still needs to be clarified. Meanwhile, the correct usage of the media to disseminate clear health information to the public during massive catastrophic events might be able to minimise the likelihood of strikes of mass psychogenic illness [24].

The second study was a systematic case-control study conducted in Nepal in 2015, in which factors associated with outbreaks of mass psychogenic illness in adolescent school populations were explored. Past observational studies have suggested that there are several factors that contribute to an increased risk for the emergence of psychogenic symptoms. Factors as somatization, neuroticism, depression and anxiety, low educational attainment, low socioeconomic status, ethnic minorities, and a history of abuse or traumatic events were all considered to be associated with high rates of psychogenic symptoms [24]. The factors associated with dissociative experiences most frequently proposed in the past literature were used in this study to explore whether they could predict cases of mass psychogenic illness. Cognitive and personality traits, i.e., cognitive failure, emotional contagion, and fantasy proneness were used in a ground-breaking experimental design [31].

Bivariate comparisons in this study demonstrated that individuals were affected by mass psychogenic illness in relation to the physical abuse experienced by the individual, as well as living in a nuclear family, peritraumatic dissociation, dissociative tendencies, depressive symptoms, and post-traumatic disorder [31]. Multivariate logistic regression analyses suggested that correlates of dissociation did not predict cases and correlates of dissociation did not explain the nature of the emergence of mass psychogenic illness. Nevertheless, in a special classification and regression tree analysis, researchers found that if an adolescent had strong hypnotizability and had reported a peritraumatic dissociative experience, there was a 73% probability of being a case in mass psychogenic illness strike [31]. (Hypnotizability refers to an individual's ability to experience suggested alternations in physiology, senses, emotions, thoughts and behaviour during hypnosis [32].) This result is generally consistent with previous studies in adult populations. Hypnotizability could therefore be considered as the strongest predictor of mass psychogenic illness cases. It could be speculated that future practitioners of clinical psychology and administrators of public health agencies might be able to use hypnotizability to prevent and intervene in the strike of mass psychogenic illness.

Furthermore, another approach to the study of mass psychogenic illness outbreaks considers illness behaviour as learned and patterned at the cultural perspective and could serve as an adaptation in the corresponding social context [33]. Hence, in future research of mass psychogenic illness, researchers should consider social, cultural and school- and family-related factors in addition to other psychological factors (e.g., suggestibility, behavioural mimicry, etc.) in their research [34]. The use of some anthropological and qualitative research methods in study might be a good option.

## 6. Conclusion

In general, after reviewing and summarising the reports and studies on mass psychogenic illness in the past few decades, it is found that there are still many gaps in researchers' recognition of mass psychogenic illness. Mass psychogenic illness still needs to be further researched and explored. Firstly, due to exclusionary clinical diagnostic methods, there are still no definitive and accepted

diagnostic features for the outbreak of mass psychogenic illness. Secondly, the pathological agents of mass psychogenic illness have not been identified. Third, the nature of the mass psychogenic illness is considered controversial by some researchers. Fourth, a new type of mass psychogenic illness – MSMI, that does not require physical proximity has emerged in the rapid development of social media in the past decade. Experts need to explore the mechanisms of transmission of this emerging mass psychogenic illness and try to suggest effective intervention strategies. Finally, experiments have shown that mass psychogenic illness is inducible and that the possibility of mass psychogenic illness being artificially induced in the public needs to be concerned.

In the meantime, the research content of this article has some limitations. First of all, since the literature review is used as the research method of this article, the content of this paper is completely based on the literature published in the past. Secondly, much of the literature on the mass psychogenic illness over the last two to three decades has been post-hoc observational reports, which have provided a significant proportion of qualitative data, and more quantitative analyses still need to be used in the study of mass psychogenic illness.

Although there is still a considerable gap in the study of mass psychogenic illness, researchers have made some crucial progress in the last decade. Firstly, a study in 2015 identified a very important predictor of cases of mass psychogenic illness - hypnotizability. Future psychologists can use hypnotizability as the key object when designing experiments and studies, and clinical psychology practitioners can use hypnotizability to predict the emergence of cases when they face the outbreak of mass psychogenic illness.

In addition, for researchers who explore mass psychogenic illness in the future, more factors should be considered in the research. For instance, the influence of social, cultural, and school and family-related factors of mass psychogenic illness. Anthropological and sociological research methods can be considered in future research.

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