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REVIEW ARTICLE

The psychology of health and well-being in mass gatherings: A review and a research agenda



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Abstract Mass gatherings bring large numbers of people into physical proximity. Typically, this physical proximity has been assumed to contribute to ill health (e.g., through being stressful, facilitating infection transmission, etc.). In this paper, we add a new dimension to the emerging field of mass gatherings medicine. Drawing on psychological research concerning group processes, we consider the psychological transformations that occur when people become part of a crowd. We then consider how these transformations may have various consequences for health and well-being. Some of these consequences may be positive. For example, a sense of shared identity amongst participants may encourage participants to view others as a source of social support which in turn contributes to a sense of health and well-being. However, some consequences may be negative. Thus, this same sense of shared identity may result in a loss of disgust at the prospect of sharing resources (e.g., drinking utensils) which could, in turn, facilitate infection transmission. These, and related issues, are illustrated with research conducted at the Magh Mela (North India). We conclude with an agenda for future research concerning health practices at mass gatherings.

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1. Introduction

In this paper, we draw on contemporary psychological understandings of crowd processes in order to add a new dimension to the emerging field of mass gatherings medicine. First, we consider research on the psychological transformations that occur when people become part of a crowd. Second, we review how these impact health and well-being. Third, we identify an agenda for future research.

Mass gatherings medicine addresses the health dangers that arise when large numbers of people come together for religious events (e.g., the Hajj or the North Indian Magh Mela), sporting events (e.g., the Olympics) or music festivals (e.g., Glastonbury). Mere proximity to so many people makes exposure to infection more likely [1]. Such risks are compounded by the rudimentary living conditions (e.g., poor sanitation) and the noise and crowding [2,3] that tend to characterise such events. These conditions bring their own health risks, and moreover, may make people less resilient (and less careful) in relation to the dangers of infection transmission. Altogether, this leads to well-documented risks of infection within both major religious [4–6] and nonreligious gatherings [1].

There is also potential for infection to spread beyond the gatherings themselves: people may come from many countries, mingle in the crowd, share their infections, and then take them home. In this way, mass gatherings can transform local outbreaks into global pandemics [7]. Not surprisingly, then, mass gatherings medicine research focuses on physical processes of disease transmission and views mass gatherings as a health problem.

This agenda has proved highly productive. It has motivated efforts to mitigate health risks through good planning, effective surveillance, and the implementation of basic prophylactic measures—such as wearing face masks [8,9]. Our intention is not to question such excellent work. Rather, we argue that the present agenda is partial in two important ways, and that the existing work needs to be complemented by an additional stream of studies and interventions.

Our first concern is that current work addresses physical factors in disease transmission but ignores psychological factors. Typically, the crowd is taken to be significant in terms of the simple number of people who are present and how the large number of people increases the probability of disease transmission. This overlooks the psychological transformations that occur when people become part of a crowd and how these shape behaviours relevant to disease transmission in particular and to health and well-being more generally.

Our second concern is that the emphasis on physical factors encourages a focus upon the negative impact of mass gatherings on health, thereby contributing to an approach to crowds which views them purely as a problem. Once one examines the psychological transformations that occur in crowds, the way is opened to a more nuanced approach which addresses both the health benefits and the health costs of mass gathering participation. Furthermore, it opens the way to practical interventions which not only mitigate risks, but also can harness the potential for mass gatherings to be a source of public health.

We start by outlining the social psychology of mass gatherings. We then consider how these social psychological processes may give rise to both health benefits and health risks. From this, we consider the types of intervention which could tip the balance from risks to benefits. Sometimes we draw on a solid research base. Sometimes we can be little more than illustrative because the necessary research remains to be done. Accordingly, we finish by outlining an agenda for future research into the psychological dimension of health and ill health at mass gatherings.

2. The psychology of mass gatherings

There is a longstanding view that when people enter crowds they lose their sense of self, lose their sense of judgement, and become capable of the most extreme actions [10]. However, over the last half century, this view has lost academic credibility. Instead, drawing on the social identity approach to group processes [11,12] (probably the most influential contemporary approach to

groups in psychology), researchers make a key distinction between a mere physical gathering, where a large number of people happen to be co-present at the same time (say shoppers in a market), and a psychological crowd, where those present see each other as belonging to the same broad social group (e.g., fans of a club at a football match, supporters of a party at a political rally, pilgrims at a religious event, etc.). In other words, a physical crowd is one in which people, despite being together, retain a strong sense of their unique personal identities. However, a psychological crowd is one where people perceive a common group membership and assume a shared social identity [13].

Where people experience a sense of shared identity, and form a psychological crowd, a number of psychological transformations occur which lead to a contrast with their conduct in terms of their unique personal identities. First, there is a cognitive transformation. People stop behaving in terms of their idiosyncratic beliefs and start behaving on the basis of shared norms, values, and understandings. People prioritise what is seen as valuable from the group perspective. In relation to this, people are influenced by others only to the extent that they are seen as group members and what they propose is seen as reflecting these shared ingroup belief systems [14,15].

Second, there is a relational transformation. That is, people see others in the crowd as part of the extended group self rather than as "others". This leads to a shift towards greater intimacy and much research shows how shared identity results in greater trust, respect, cooperation, mutual influence, helping, and also expectations of help from others [16–20].

Third, there is an emotional transformation. Indeed, observers often see an intense positive effect - what the sociologist Emile Durkheim famously dubbed "effervescence" [21] - as the most notable characteristic of crowds. Typically, observers have attributed this heightened affect to a loss of reason. However, recent research corroborates Durkheim's own suggestion that effervescence is tied to the meaningful nature of crowds for their participants [22]. Thus, people take great pleasure in the close and supportive relationships that we have just described as arising out of shared identity in crowds. More than that, such close relationships allow people to work together and to be more effective in reaching their shared goals. In the Mela, for instance, people help each other in overcoming the hardships of the pilgrim life and give each other space to live according to Hindu precepts. Such "collective self-realisation" is closely related to the joy of crowds [22,23].

It is important to stress that not all mass gatherings will exhibit these various transformations. Not all mass gatherings produce the underlying shared identity which is necessary for them to occur. This may be because people self-define in terms of their personal uniqueness. It may also be because the event is characterised by factionalism with people identifying in terms of a variety of different social identities rather than in terms of a common group membership [24,25]. Thus, we cannot assume that all participants at any one event will experience a sense of shared identity with all [23]. However, where individuals do see each other as members of a common social group, then there will be significant transformations in all that they think, feel, and do. This includes the cognitions, emotions, and actions that impact upon health and well-being. Let us now consider the various ways in which the psychology of crowds impacts health in general and processes of disease transmission in particular. We look, first, at the nature of the stressors which operate in mass gatherings to undermine health and resilience. Second, we consider participants' behaviour, and the ways in which people expose themselves to health risks.

3. Collective psychology and the nature of stress in mass gatherings

We noted above how the difficult conditions characterising mass gatherings are seen as undermining health, decreasing resilience, and increasing opportunities for infection and disease transmission. However, recent research suggests that collective psychology can alter the very nature of sensory experience. Therefore, while mass gatherings are often densely packed and extremely loud, it cannot be presupposed that crowding and noise constitute stressors and necessarily undermine health and well-being.

With regard to crowding, laboratory studies show that when others are regarded as in-group members with whom we have a shared identity, then we desire greater physical proximity to them [26]. These findings have been replicated and extended in field studies of mass gatherings. Thus, a recent study of hajjis shows that, far from finding dense crowds aversive, participants can feel safer when the crowds are denser. Importantly, this effect depends upon participants identifying with others in the crowd with the effect being mediated by the expectation that fellow hajjis will be supportive towards them [27]. Another study, conducted at a very different gathering (an outdoor music event), provides similar findings

[28]. Greater identification with fellow participants led to feeling less crowded (even when, objectively, the crowd was very dense) and to a more positive experience. In sum, crowd density is not necessarily a stressor. All depends upon how one represents those co-present in relation to oneself.

Research also shows that the noise associated with mass gatherings should not be assumed to constitute an aversive stressor. Noise has been described as “sound out of place” [29] which implies that our experience of an auditory stimulus is not simply a reflection of its intrinsic properties, but depends on the meanings attributed to it. The significance of this for the experience of mass gatherings is illustrated by experimental research conducted at the Magh Mela. The site, where pilgrims come for a whole month, is full of sound systems constantly broadcasting songs, speeches, and announcements. The average sound level is akin to that of a busy city street (85–90 dB) and this extends well into the night. In order to research how this noise was experienced, pilgrims listened to an ambiguous sound clip that could be labelled as coming either from the religious festival itself or a secular urban setting. In the former case, pilgrims found the clip more meaningful and interesting, less uncomfortable, and they also chose to listen to it for longer [30]. Moreover, we obtained evidence that this same clip was processed differently when it was labelled as coming from the Mela [31].

These experimental findings are corroborated by ethnographic research amongst pilgrims. Pilgrims denied finding the constant noise intrusive, at least as long as it was the noise of religious music and religious meetings [30]. One respondent referred to this as the sound of the Saraswati - the mythical river of knowledge which contributes to making the Allahabad Mela such a sacred site [32]. By contrast, the secular sounds of the public announcement system were found annoying.

For noise, as for crowding, the key point is that sensory experience is not a simple function of objective sensory characteristics. Social meaning matters and this meaning is bound up with whether the stimulus is consistent or inconsistent with one's social identity. In the case of crowding, this is a matter of whether others do or do not share one's group membership [27]. In the case of noise, it is a matter of whether the sound is or is not an expression of the group's culture [30].

Thus far, our argument has been that an understanding of collective psychology leads us to rethink what constitutes a stressor in the crowd

and that many characteristics of mass gatherings conventionally seen as stressors may not be experienced as such. This amounts to arguing that mass gathering settings might not be quite as bad for health and well-being than they have been seen to be. However, there is evidence to suggest that we can go further. Mass gatherings may, in some ways, actually bring health benefits.

A critical element here is social support. A growing body of research shows how shared social identification in a group leads to an increased sense of social support from others, which leads to a greater sense that one can cope with difficult circumstances which decreases stress, resulting in improved mental and physical well-being. These relationships have been shown for people working in demanding jobs [33,34], for the elderly in old age homes [35], for soldiers in army units [36], and also, more generally, amongst members of local communities [37,38]. Indeed, such is the scale of this evidence that social psychologists refer to building shared identity as the basis of a “social cure” [39].

Critically, for the present argument, there is evidence that the “social cure” operates in mass gatherings. We have already reported evidence from the Hajj to show the link between shared identity, expectations of social support, and greater positivity about the crowd [27]. We also have evidence from the Magh Mela which demonstrates the final link to improved well-being [40]. In this latter, Tewari et al. [40] researched a sample of participants and a sample of comparable nonparticipants. The research was longitudinal. Before the mass gathering took place, both samples reported very similar levels of self-assessed health and symptoms of ill health. Three months later and after the Mela, the two samples differed with those undertaking the pilgrimage reporting better self-assessed health and fewer symptoms of ill health than the controls. Moreover, the extent of participants' health improvements from before to after the event were related to the extent that they had a sense of shared identity and a sense of relational intimacy with fellow pilgrims during the event [41].

It is important to acknowledge this is preliminary work. First, it relies on self-reported measures of health, and although these correlate well with more objective measures [42], future studies should collect physiological data too. Second, it only measures post-event health at roughly 1 month afterwards. It would be desirable to design studies which take multiple post-event measures in order to see how long any effect endures. Third,

we do not know the physiological mechanisms through which any such effects are caused. An obvious candidate is immune function [43]. Again, it would be desirable to investigate such mechanisms in the future. So clearly, more research is needed. Nonetheless, this evidence suggests a broad reappraisal of the relationship between mass gatherings and health. Rather than seeing such events purely as a problem and as a threat to global health, we need to address both the negatives and the positives. As well as constituting a motor for global pandemics, mass gatherings may also provide a basis for health benefits at a societal level.

4. Collective psychology and health practices

In arguing that mass gatherings can be both good and bad for health, we are certainly not suggesting that the former relate to psychology and the latter to medicine. Rather, we wish to bring psychology and medicine together and consider how each of the psychological transformations we have described impacts upon health-related practices in mass gatherings.

Starting with the cognitive transformation, those who identify with a group shape their behaviour by reference to collective norms and values rather than their own individual values. These norms will be specific to a given group and hence will vary between different gatherings: the norms at religious festivals are characteristically a matter of abstinence while at music festivals they are more to do with excess. Thus, rather than making general claims, we need to address how the specific norms and values of a particular mass gathering impact the extent to which people expose themselves and respond to health risks.

At the extreme, there are cases where everyday health values are inverted. At the Hajj and the Magh Mela, for instance, participants' understandings of the location and event may diminish their concerns about health. In Hindu traditions, pilgrimage is closely bound up with beliefs concerning the gaining of religious merit [44] and such beliefs may mean that physical health loses its value. Not only may there be concerns about gaining religious merit, which attenuate everyday concerns about health, but there is historical evidence that death at some Hindu pilgrimage sites may be embraced rather than feared [45]. Similar beliefs about the desirability of death after having just completed a purifying pilgrimage may also be found in other religions [46].

In addition to this, there may be normative practices which, while not specifically intended to cause ill health, nonetheless put people at greater risk [47]. Thus at the Magh Mela, predominantly elderly pilgrims commit to bathe in the cold and polluted Ganges [48]. This can have serious consequences for their health and has been shown to result in an increase in the number of cases of non-bloody diarrhoea [5]. To take another example, at the annual Hindu festival at the Lord Murugan Temple of Nallur in Jafna, Sri Lanka, pilgrims soak in the temple's water tank before performing rituals while lying on sand. This leads to infections of the skin (cutaneous larva migrans) caused by parasitic larvae. Moreover, not all pilgrims regard this as a problem that should be avoided: some believe it to be a sign of divine grace [49]. Here, then, we begin to see some of the negative impacts of collective norms (and beliefs) on health.

Moving on to the relational transformation of crowd psychology, there are a number of general consequences which flow from the sense of intimacy, empathy, trust, and respect, associated with a shared identity. Some of these consequences may be positive for health. For example, feelings of intimacy and empathy result in greater sensitivity to others' well-being, making it more likely that others' health needs will be noticed and that people will help those who are unwell (e.g., through sharing medicines, giving them water, etc.). This empathy to others' predicaments may also lead people to help each other when they are struggling with the harsh conditions that characterise many mass gatherings. For example, pilgrims at the Magh Mela report helping each other endure and overcome the bitter weather that make living on the banks of the Ganges in simple tents and bathing in the cold Ganges waters a testing ordeal [48].

Yet, other consequences may be more negative for health. For example, the sense that social support is available from one's fellows [48] can lead people to overlook symptoms that actually indicate a health problem. Indeed, it is likely that this can result in them continuing when they should in fact stop and seek medical help. Moreover, by continuing, they may expose themselves to further risks that compound their original vulnerability. Perhaps more worryingly, the relational transformations that flow from a sense of shared identity in crowds, notably the sense of trust and empathy, may lead people to relax normal precautions in dealing with others. Specifically, they may be more willing to share resources (e.g., food, eating implements, clothes etc.) in such a way as to make the

