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The psychological impact of quarantine and how to reduce it: rapid review of the evidence

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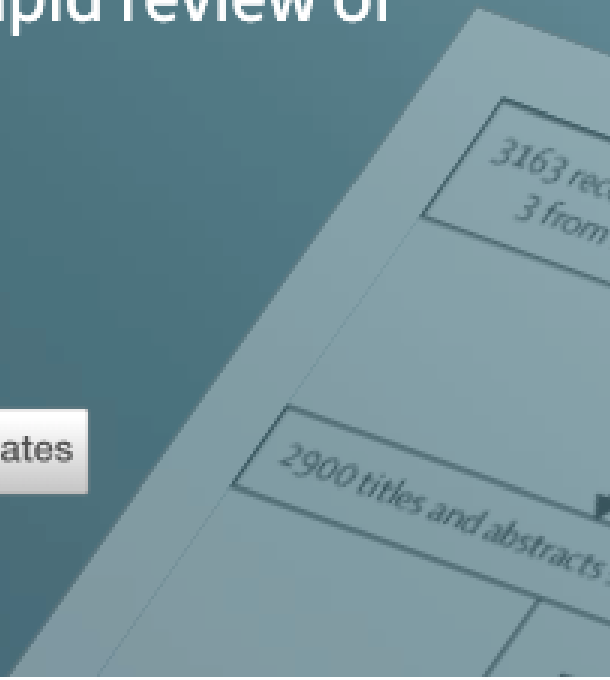

Introduction

Quarantine

The separation and restriction of movement of people who have potentially been exposed to a contagious disease

Isolation

The separation of people who have been diagnosed with a contagious disease from people who are not sick

Terms used interchangeably in communication

Introduction

Quarantine

- Leprosy in Venice, Italy in 1127
- Black Death
- 300 years later, plague in the UK
- SARS outbreak in China and Canada in 2003
- Ebola outbreak in many west African countries

Why is this Review needed?

Unpleasant experiences

- separation from loved ones, the loss of freedom, uncertainty over disease status, and boredom

Occasionally dramatic effects

- Suicide, substantial anger, and lawsuits

Screening Process

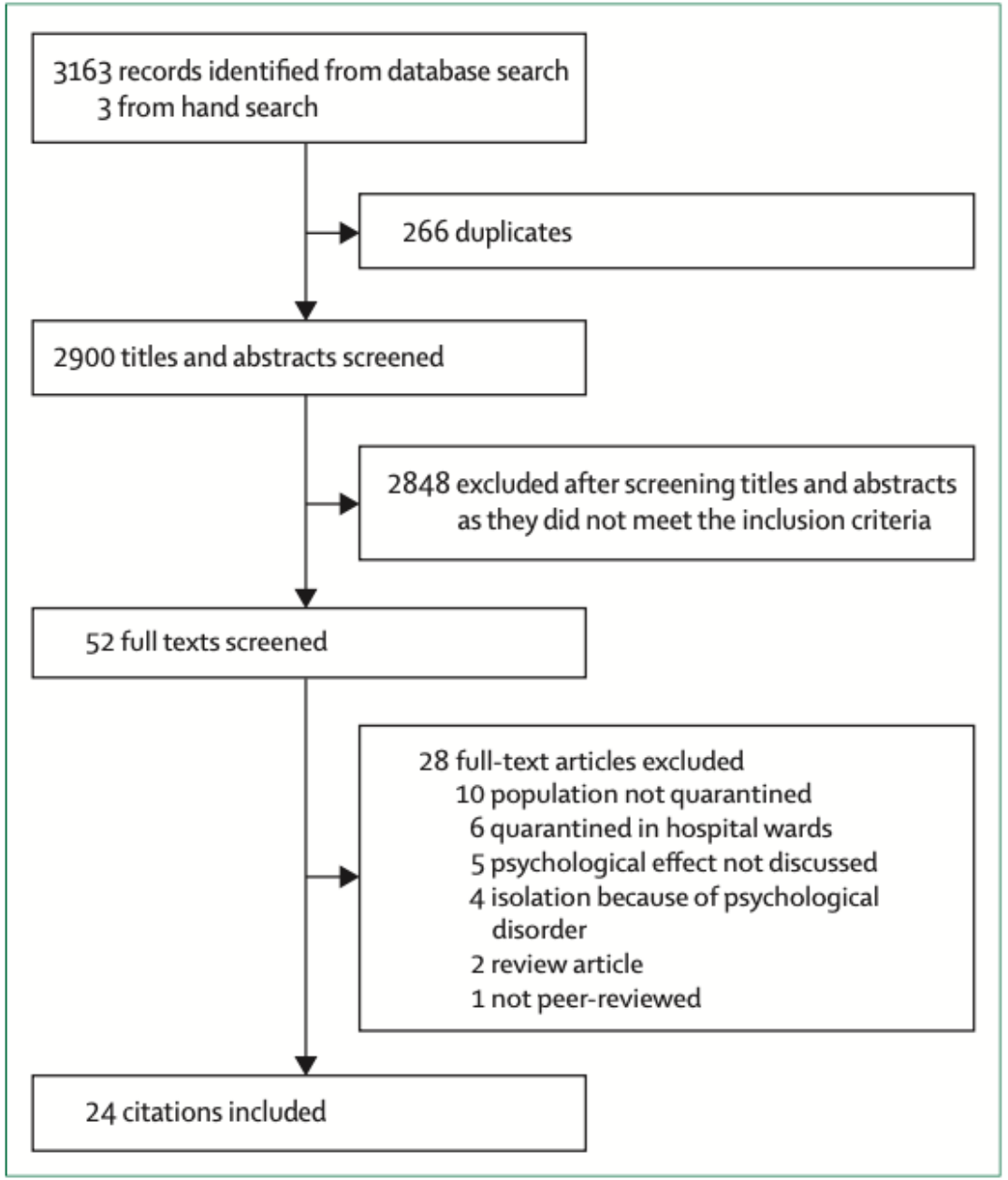

Figure: **Screening profile**

Study Characteristics (1)

Cross 10 countries

Numbers of studies:

- SARS: 11
- Ebola: 5
- H1N1: 3
- MERS: 2
- equine influenza: 1

	Country	Design	Participants	Quarantine period	Measures
Bai et al (2004)[9]	Taiwan	Cross-sectional	338 hospital staff	9 days because of contact with suspected SARS cases	Study-specific survey; SARS-related stress survey composed of acute stress disorder criteria according to the DSM-IV and related emotional and behavioural changes
Blendon et al (2004)[10]	Canada	Cross-sectional	501 Canadian residents	Length unclear; exposure to SARS	Study-specific survey
Braunack-Mayer et al (2013)[11]	Australia	Qualitative	56 school community members	Length unclear; H1N1 influenza	Interview
Caleo et al (2018)[12]	Sierra Leone	Mixed methods	1161 residents of a rural village; 20 of whom took part in an interview study	Length unclear; entire village on restricted movement because of Ebola	Interview
Cava et al (2005)[13]	Canada	Qualitative	21 Toronto residents	5–10 days because of SARS contact	Interview
Desclaux et al (2017)[14]	Senegal	Qualitative	70 Ebola contact cases	21 days because of Ebola contact	Interview
DiGiovanni et al (2004)[15]	Canada	Mixed methods	1509 Toronto residents	Duration of quarantine was the difference between the incubation period of SARS (taken as 10 days) and the time that had elapsed since their exposure to a SARS patient	Interviews, focus groups, and telephone polls
Hawryluck et al (2004)[16]	Canada	Cross-sectional	129 Toronto residents	Median of 10 days because of potential SARS exposure	IES-R to assess post-traumatic stress and CES-D to assess depression
Jeong et al (2016)[17]	South Korea	Longitudinal	1656 residents of four regions in Korea	2 weeks because of contact with MERS patients	GAD-7 to assess anxiety and STAXI-2 to assess anger

Study Characteristics (2)

Lee et al (2005)[18]	Hong Kong (Special Administrative Region, China)	Mixed methods	903 residents of Amoy Gardens (the first officially recognised site of community outbreak of SARS in Hong Kong) took surveys; 856 of whom were not diagnosed with SARS; 2 of whom were interviewed	Length unclear; residents of a SARS outbreak site	Study-specific survey
Liu et al (2012)[19]	China	Cross-sectional	549 hospital employees; 104 (19%) of whom had been quarantined	Length unclear; home or work quarantine because of potential SARS contact	CES-D to assess depressive symptoms and IES-R to assess post-traumatic stress symptoms
Marjanovic et al (2007)[20]	Canada	Cross-sectional	333 nurses	Length unclear; SARS exposure	MBI-GS to assess burnout; STAXI-2 to assess anger; six study-specific questions to assess avoidance behaviour
Maunder et al (2003)[21]	Canada	Observational	Health-care workers (sample size unavailable)	10 days voluntary quarantine because of potential SARS contact	Observations of health-care staff
Mihashi et al (2009)[22]	China	Retrospective cross-sectional	187 printing company workers, university faculty members and their families, and non-medicine students	Length unclear; citywide isolation because of SARS	GHQ-30 to assess psychological disorders
Pan et al (2005)[23]	Taiwan	Observational	12 college students	Length unclear; asked to limit interactions outside the home because of potential SARS contact	Observations of a support group for home-quarantined students

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Study Characteristics (3)

	Country	Design	Participants	Quarantine period	Measures
(Continued from previous page)					
Pellecchia et al (2015)[24]	Liberia	Qualitative	432 (focus groups) and 30 (interviews) residents of neighbourhoods with incidence of Ebola	21 days because neighbourhoods had epidemiological incidence of Ebola	Interviews and focus groups
Reynolds et al (2008)[25]	Canada	Cross-sectional	1057 close contacts of potential SARS cases	Mean 8·3 days; range 2–30 days because of contact with potential SARS cases	IES-7 to assess post-traumatic stress symptoms
Robertson et al (2004)[26]	Canada	Qualitative	10 health-care workers	10 days home quarantine, or continually wearing a mask in the presence of others, or required to attend work but had to travel in their own vehicle and wear a mask, because of SARS exposure	Interviews
Sprang and Silman (2013)[27]	USA and Canada	Cross-sectional	398 parents	Length unclear; lived in areas severely affected by H1N1 or SARS	PTSD-RI Parent Version and PCL-C
Taylor et al (2008)[28]	Australia	Cross-sectional	2760 horse owners or those involved in horse industry	Several weeks because of equine influenza	K10 to assess distress
Wang et al (2011)[29]	China	Cross-sectional	419 undergraduates	7 days; non-suspected H1N1 influenza cases	SRQ-20 to assess general mental health and IES-R to assess post-traumatic stress
Wester and Giesecke (2019)[30]	Sweden	Qualitative	12: six health-care workers who worked in west Africa during the Ebola outbreak and one close contact for each of them	3 weeks because of working in west Africa during the Ebola crisis	Interview
Wilken et al (2017)[31]	Liberia	Qualitative	16 residents of villages who were quarantined	21 days because of living in a village in which someone had died of Ebola	Interview
Wu et al (2008, 2009)[32,33]	China	Cross-sectional	549 hospital employees	Length unclear; either because of SARS diagnosis, suspected SARS, or having had direct contact with SARS patients	7 questions adapted from NHSDA to assess alcohol dependence and abuse; IES-R to assess post-traumatic stress symptoms; CES-D to assess depression
Yoon et al (2016)[34]	South Korea	Psychological evaluation by professionals	6231 Korean residents	Length unclear; placed in quarantine because of MERS	Questions such as 'for the last 2 weeks or after being in quarantine, do you feel depressed or hopelessness? Do you feel loss of interest in any part of your life?'

SARS=severe acute respiratory syndrome. DSM-IV=Diagnostic and Statistical Manual of Mental Disorders-IV. IES-R=Impact of Event Scale-Revised. CES-D=Center for Epidemiologic Studies Depression scale. MERS=Middle East respiratory syndrome-related coronavirus. GAD-7=Generalised Anxiety Disorder-7. STAXI-2=State-Trait Anger Expression Inventory. MBI-GS= Maslach Burnout Inventory-General Survey. GHQ-30=General Health Questionnaire-30. IES-7=International Education Standard-7. PTSD-RI=Post-Traumatic Stress Disorder Reaction Index. PCL-C=PTSD Checklist-Civilian version. K10= Kessler 10 Psychological Distress Scale. SRQ-20=Self-Reporting Questionnaire-20. NHSDA=National Household Survey on Drug Abuse.

Table: Study characteristics

The psychological impact of quarantine

Quarantined hospital staff during SARS

- Being quarantined is predictive of symptoms of acute stress disorder
- More likely to reporting exhaustion, detachment from others, anxiety when dealing with febrile patients, irritability, insomnia, poor concentration and indecisiveness, deteri-orating work performance, and reluctance to work or consideration of resignation

Bai, et al. Survey of stress reactions among health care workers involved with the SARS outbreak. Psychiatr Serv 2004

4 times higher post-traumatic stress symptoms scores in parents and children quarantined than those not quarantined

Posttraumatic stress disorder in parents and youth after health-related disasters. Disaster Med Public Health Prep 2013

The psychological impact of quarantine

Hospital staff examined symptoms of depression 3 years after:

- 9% of the whole sample reported high depressive symptoms
- High depressive symptoms group: nearly 60% had been quarantined

  Low depressive symptoms group: only 15% had been quarantined

Liu, et al. Depression after exposure to stressful events: lessons learned from the severe acute respiratory syndrome epidemic. *Compr Psychiatry* 2012

Qualitative studies showing psychological distress:

- "emotional disturbance, depression, stress, low mood, irritability, insomnia, post-traumatic stress symptoms, anger, and emotional exhaustion"
- High prevalence of low mood (73%) and irritability (57%)

Lee, et al. The experience of SARS-related stigma at Amoy Gardens. *Soc Sci Med* 2005

Long-term effect of quarantine

Alcohol abuse and tendency 3 year after SARS

Alcohol abuse/dependence symptoms among hospital employees exposed to a SARS outbreak. *Alcohol Alcohol* 2008

After quarantine, many participants continued to engage in avoidance behaviours

Long--term behavioural changes

- vigilant handwashing and avoidance of crowds, and the return to normality was delayed by many months

The experience of quarantine for individuals affected by SARS in Toronto. Public Health Nurs 2005

Prequarantine predictors of psychological impact

Mixed evidence about demographics

- Health-care worker status with more psychological impact

  Understanding, compliance and psychological impact of the SARS quarantine experience. *Epidemiol Infect* 2008

- Health-care worker status not associated with psychological outcome

  SARS control and psychological effects of quarantine, Toronto, Canada. Emerg Infect Dis 2004

Stressors during quarantine

1. Duration of quarantine
2. Fears of infection
3. Frustration and boredom
4. Inadequate supplies
5. Inadequate information

Stressors postquarantine

1. Finances
2. Stigma
   - avoiding them, withdrawing social invitations, treating them with fear and suspicion, and making critical comments
   - Intra-household tension, unable to resume their jobs

     Accepted monitoring or endured quarantine? Ebola contacts' perceptions in Senegal. Soc Sci Med 2017
   - Disenfranchisement
   - To Keep easily treatable, non-Ebola illnesses a secret and avoided seeking help

     Social consequences of Ebola containment measures in Liberia. PLoS One 2015;

Stressors postquarantine

Media as a powerful influence on public attitude and to contribute to stigmatizing attitude during SARS

- public health officials to provide rapid, clear, accurate messages

Fear and stigma: the epidemic within the SARS outbreak. Emerg Infect Dis 2004

What can be done to mitigate the consequences of quarantine?

1. Keep it as short as possible
2. Give people as much information as possible
3. Provide adequate supplies
4. Reduce the boredom and improve the communication
5. Health-care workers deserve special attention
6. Altruism is better than compulsion

What we do not know

Whether ther more favorable measures are effective

- social distancing, cancellation of mass gatherings, and school closures

Limited to peer--reviewed publications

Only one study followed up participants over time, sample sizes were generally small

Certain study populations

Heterogeneity of outcome measures across studies

Conclusion

Psychological impact of quarantine is wide--ranging, substantial, and can be long lasting.

Health officials:

- telling people what is happening and why
- explaining how long it will continue
- providing meaningful activities for them to do while in quarantine
- providing clear communication
- ensuring basic supplies (such as food, water, and medical supplies) are available
- reinforcing the sense of altruism that people should, rightly, be feeling

- If the quarantine experience is negative, long--term consequences in people quarantined, the health-care system who administered, and the politicians and officials who mandated

-

Key messages

- Information is key; people who are quarantined need to understand the situation
- Effective and rapid communication is essential
- Supplies (both general and medical) need to be provided
- The quarantine period should be short and the duration should not be changed unless in extreme circumstances
- Most of the adverse effects come from the imposition of a restriction of liberty; voluntary quarantine is associated with less distress and fewer long-term complications
- Public health officials should emphasise the altruistic choice of self-isolating

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