Original paper

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Psychological impact and coping strategies in persons who experienced institutional quarantine for COVID-19 in Sri Lanka

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Abstract

Background

Quarantine for any cause is known to be associated with negative psychological consequences and therefore, assessment of this experience with regards to the COVID-19 pandemic, in the local context needs to be done in order to design culturally accepted quarantine measures.

Aims

We aimed to assess rates of depression, anxiety, stress and methods of coping strategies in those undergoing institutionalized quarantine in Sri Lanka.

Methods

A cross sectional descriptive study was conducted at three selected quarantine centers from April to July 2020. All adults in the selected quarantine centers, during the study period, were considered eligible for inclusion in the study. The Depression Anxiety and Stress Scale (DASS-21) and 28-item Brief COPE were used to assess for psychological consequences and coping strategies. A telephone interview was conducted 6 months after discharge from quarantine to reassess the psychological status.

Results

Of the 367 participants, a majority (78.7%, n=289) were males and more than half of the participants were between the ages of 25-45 years (60%, n=220) and married (61.9%, n=227). Depression, anxiety and stress were seen in 6% (n=22), 2% (n=7) and 6% (n=22) respectively of the study population, during the quarantine period. Depression, anxiety and stress were significantly higher in females ($p<0.05$) and in those who had been in quarantine for more than 10 days ($p<0.01$). Stress was significantly higher in participants with comorbid medical conditions ($p<0.05$). Active coping, planning, positive reframing, self-blame and venting were associated with a higher degree of negative psychological impact ($p<0.05$). The prevalence of depression, anxiety and stress at 6-months follow-up was 1.4%, 0% and 3.6% respectively.

Conclusions

The levels of depression, anxiety and stress during quarantine, in this study was much lower than in previous literature and improved in subsequent months without specific interventions.

Key words: depression, anxiety, stress, COVID-19, quarantine

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Introduction

Quarantine is the restriction of movement, or separation of healthy persons who may have been exposed to a virus, with the objective of monitoring their symptoms and ensuring early detection of cases (1). In March 2020, the World Health Organization (WHO) recommended that contacts of confirmed COVID-19 patients be quarantined for 14 days from the time of exposure as a public health measure to control the spread of COVID-19 infection (1).

Sri Lanka reported the first local case of COVID-19 on 11th March 2020, following which the process of quarantine was initiated in the country. Returnees from overseas and contacts of local patients were quarantined in designated government quarantine centers for a period of 14 days. By the 1st of April, 40 quarantine centers were established in Sri Lanka, under the Ministry of Defense. These centers provided separate rooms or dormitories, food, water and healthcare free of charge.

Quarantine is known to be associated with negative psychological consequences, including psychological distress, post-traumatic stress, emotional disturbance, depression, stress, low mood, irritability, insomnia, anger and emotional exhaustion (2-9). Evidence suggests that these psychological effects of quarantine may persistent for months or years (8,9). This is the first time in history where Sri Lanka had to implement mass scale quarantine procedures. Cultural, geographic and economic factors are known to affect the effectiveness of quarantine (1). Therefore, the WHO recommends rapid assessment of the local context of quarantine measures in order to identify the drivers of success and the potential barriers to quarantine, in order to design culturally accepted quarantine measures (1). At present, to the best of our knowledge there are no published studies examining the psychological impact of institutional quarantine in Sri Lanka. We aimed to assess the psychological consequences and coping strategies of those who underwent institutionalized quarantine in Sri Lanka, in order to effectively plan future mass scale quarantine services.

Methods

This was a cross sectional descriptive study carried out at three quarantine centers in Sri Lanka. All consenting adults (>18 years) in the three selected quarantine centers were considered eligible to be included in the study. Those who gave written informed consent were included in the study. Two of the three selected centers were from the North Central province and the third center was from the Uva province. Data was collected from April to July 2020. A total of 2814 cases of COVID-19 infections were reported in the country at the time of conducting the study (10). Home quarantine had not yet been introduced in Sri Lanka at the time and all contacts of COVID positive patients were being quarantined in quarantine centers. None of the participants recruited were COVID positive at the time of the study.

An interviewer administered questionnaire specifically designed for this study, was used to collect socio-demographic details and risk factors for development of negative psychological consequences. The translated and validated 21- item Depression Anxiety and Stress Scale (DASS-21) was used to assess for psychological distress (11). The Depression, Anxiety and Stress Scale - 21 Items (DASS-21) is a set of three self-report scales designed to measure the emotional states of depression, anxiety and stress. Each of the three DASS-21 scales contains 7 items, divided into subscales with similar content. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items. A score of 5 or more for depression, 3 or more for anxiety, and 7 or more for stress indicates high/elevated levels of depression, anxiety and stress respectively. The scores are further divided into mild, moderate, severe and extremely severe. In the depression category, scores in the range of 5-6, 7-10, 11-13, and 14 or more, indicates mild, moderate, severe and extremely severe depressive symptoms, respectively. In the anxiety category, a score of 4-5, 6-7 and 8-9, indicates mild, moderate and severe - anxiety symptoms respectively, and a score of 10 or more indicates extremely severe anxiety symptoms. With regard to stress, a score of 8-9, 10-12 and 13-16 indicates mild, moderate and severe stress respectively, and a score of 17 or more indicates extremely severe stress.

The 28-item brief COPE, which is validated for the Sri Lankan population,was used to measure coping strategies (12). The Brief-Cope was developed internationally as a short version of the original 60-item COPE scale (13). Scores are presented for the two coping styles: (A) avoidant coping, which involves the subscales of denial, substance use, venting, behavioural disengagement, self-distraction and self-blame; and (B) approach coping which involves subscales of active coping, namely positive reframing, planning, acceptance, seeking emotional support, and seeking informational support.The Brief COPE has been used to measure the coping mechanisms in persons undergoing home or institutionalized quarantine (in either specialized quarantine centers, hospitals or hostels) in several studies globally (14-19).

A telephone interview was conducted 6 months after discharge from institutionalized quarantine (during September to December 2020) to reassess the psychological status of the study participants, and during this interview the DASS-21 was re-administered over the phone. Recent evidence suggests that the mode of administration of a self-report questionnaire (i.e. whether self-administered or interviewer administered) produce equivalent scores overall and supports the use of mixed modes of administration of a study instrument within a research study, which justified the use of DASS over the telephone for followup (20).

Ethical clearance was obtained from the Ethics Review Committee of the Faculty of Medical Sciences, University of Sri Jayewardenepura (approval no: COVID 02/20). Permission to carry out the study was obtained from the Deputy Director General of Health Services. Written informed consent was obtained from all subjects. Participants were informed that they had the right to refuse participation or to withdraw from the study at any point, and that this would not affect their care within the quarantine centers. Participants who were identified as having severe depression, anxiety or stress were referred to the local mental health services upon discharge from quarantine centers.

Results

Of the 367 participants, a majority (78.7%, n=289) were males and more than half were between the ages of 25-45

years (60%, n=220) and married (61.9%, n=227). A quarter (25.1%, n=92) had passed advanced level, 15.8% (n=58) had studied up to year 13 (but not passed advanced level) and further 21.8% (n=20) had passed ordinary level. Five participants (1.4%) had a past history of psychiatric disorder and 7.6% (n=28) were on treatment for chronic medical conditions. Fifty-nine-point one percent (n=217) of the participants had been in quarantine for more than 10 days at the time of the study. More than 90% were able to keep in contact with their family during quarantine (91.3%, n=335) and had access to leisure activities (95.4%, n=350) within the quarantine centers.

Psychological consequences

Depression, anxiety and stress, as per the DASS-21, were seen in 6% (n=22), 2% (n=7) and 6% (n=22) of the participants respectively, during the quarantine period (Table 1). Rates of depression, anxiety and stress were significantly higher in females ($p<0.05$) and in those who had been in quarantine for more than 10 days ($p<0.01$). Levels of stress, but not anxiety or depression, were significantly higher in those with comorbid medical conditions ($p<0.05$). Depression, anxiety or stress were not associated with age, level of education, marital status or religion. Those having higher levels of depression was at a significantly higher risk of having anxiety and stress ($p<0.01$) and vice versa.

Coping strategies

Active coping, acceptance and positive reframing were the most common coping strategies used. Substance use (15.5%) and self-blame (26.3%) were the least used coping strategies (Table 2). Active coping (i.e. concentrating efforts on doing something about the situation, taking action to try to make the situation better), planning (i.e. trying to come up with a strategy about what to do, thinking hard about what steps to take), positive reframing (i.e. trying to see it in a different light to make it seem more positive), self-blame (i.e. criticizing oneself, blaming self for things that happened) and venting (i.e. saying things to let unpleasant feelings escape) were associated with a higher degree of negative psychological impact ($p<0.05$) (Table 3).

Follow-up

The follow-up sample included 221 participants and 146 participants (40%) were lost to follow-up. The prevalence of depression, anxiety and stress on follow-up interview was 1.4%, 0% and 3.6% respectively, which was much lower than the baseline assessment rates.

Table 1. Levels of depression, anxiety and stress among participants during the quarantine period (n=367)

	Normal/ No symptoms	Mild	Moderate	Severe	Extremely severe
Depression	94.0% (345)	3% (11)	0.8% (3)	0.5% (2)	1.6% (6)
Anxiety	98.1% (359)	0 (0)	0.3% (1)	0 (0)	1.6% (6)
Stress	94.0% (345)	1.9% (7)	2.2% (8)	1.4% (5)	0.3% (1)

Table 2. Self-reported coping mechanisms used by the participants (n=367)

	Type of coping	Not at all	A little bit	A medium amount	A lot
1. I've been turning to work or other activities to take my mind off things	Self-distraction	33.0% (n=115)	24.9% (n=87)	17.8% (n=62)	24.1% (n=84)
2. I've been concentrating my efforts on doing something about the situation I'm in	Active coping	17.5% (n=61)	19.8% (n=69)	23.6% (n=82)	39.1% (n=136)

(Continued)

	Type of coping	Not at all	A little bit	A medium amount	A lot
3. I've been saying to myself "this isn't real".	Denial	61.6% (n=215)	20.6% (n=72)	2.9% (n=10)	14.6% (n=51)
4. I've been using alcohol or other drugs to make myself feel better	Substance use	79.7% (n=279)	10.6% (n=37)	2.6% (n=09)	6.9% (n=24)
5. I've been getting emotional support from others	Emotional support	51.7% (n=180)	31.6% (n=110)	10.9% (n=38)	5.7% (n=20)
6. I've been giving up trying to deal with it	Behavioural disengage-ment	65.4% (n=229)	12.6% (n=44)	8.3% (n=29)	13.7% (n=48)
7. I've been taking action to try to make the situation better	Active coping	22.8% (n=79)	18.5% (n=64)	16.2% (n=56)	42.2% (n=146)
8. I've been refusing to believe that it has happened	Denial	64.3% (n=223)	26.2% (n=91)	5.2% (n=18)	4.3% (n=15)
9. I've been saying things to let my unpleasant feelings escape	Venting	68.1% (n=237)	19.5% (n=68)	7.5% (n=26)	4.9% (n=17)
10. I've been getting help and advice from other people	Instrumental support	39.5% (n=137)	28.5% (n=99)	20.2% (n=70)	11.8% (n=41)
11. I've been using alcohol or other drugs to help me get through it	Substance use	87.1% (n=303)	10.1% (n=35)	1.7% (n=06)	0.6% (n=02)
12. I've been trying to see it in a different light, to make it seem more positive	Positive reframing	38.0% (n=131)	21.2% (n=73)	18.0% (n=62)	22.6% (n=78)
13. I've been criticizing myself	Self-blame	68.3% (n=237)	21.9% (n=76)	2.9% (n=10)	6.9% (n=24)
14. I've been trying to come up with a strategy about what to do	Planning	38.2% (n=132)	11.3% (n=39)	20.2% (n=70)	30.3% (n=105)
15. I've been getting comfort and understanding from someone	Emotional support	32.1% (n=111)	30.9% (n=107)	19.1% (n=66)	17.9% (n=62)

(Continued)

	Type of coping	Not at all	A little bit	A medium amount	A lot
16. I've been giving up the attempt to cope	Behavioural disengage-ment	67.1% (n=230)	10.8% (n=37)	2.3% (n=08)	19.5% (n=67)
17. I've been looking for something good in what is happening	Positive reframing	17.2% (n=59)	23.3% (n=80)	22.4% (n=77)	36.9% (n=127)
18. I've been making jokes about it	Humor	60.8% (n=209)	17.7% (n=61)	6.1% (n=21)	15.1% (n=52)
19. I've been doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping	Self-distraction	37.9% (n=131)	22.8% (n=79)	18.8% (n=65)	20.5% (n=71)
20. I've been accepting the reality of the fact that it has happened	Acceptance	20.6% (n=71)	16.3% (n=56)	20.3% (n=70)	42.7% (n=147)
21. I've been expressing my negative feelings	Venting	59.4% (n=205)	23.8% (n=82)	3.5% (n=12)	13.3% (n=46)
22. I've been trying to find comfort in my religion or spiritual beliefs	Religion	20.3% (n=69)	27.1% (n=92)	19.1% (n=65)	33.5% (n=114)
23. I've been trying to get advice or help from other people about what to do	Instrumental support	26.2% (n=90)	41.4% (n=142)	17.5% (n=60)	14.9% (n=51)
24. I've been learning to live with it	Acceptance	27.6% (n=95)	22.7% (n=78)	20.6% (n=71)	29.1% (n=100)
25. I've been thinking hard about what steps to take	Planning	37.4% (n=129)	14.2% (n=49)	13.3% (n=46)	35.1% (n=121)
26. I've been blaming myself for things that happened	Self-blame	75.9% (n=262)	17.1% (n=59)	3.8% (n=13)	3.2% (n=11)
27. I've been praying or meditating	Religion	49.7% (n=172)	24.9% (n=86)	13.0% (n=45)	12.4% (n=43)
28. I've been making fun of the situation	Humor	76.7% (n=264)	16.3% (n=56)	2.6% (n=09)	4.4% (n=15)

Table 3. Factors associated with presence of depression, anxiety and stress during quarantine (n=367)

	Depression		Anxiety		Stress	
	Mean score	p	Mean score	p	Mean score	p
Gender						
Male	1.71	**<0.05**	1.01	**<0.05**	2.41	**<0.05**
Female	3.76		2.61		5.07	
Days in quarantine						
<10 days	0.98	**<0.01**	0.48	**<0.01**	2.12	**<0.01**
>10 days	2.97		1.94		3.57	
COPE 1 – Turning to work or other activities to take my mind off things – Self-distraction						
No					1.84	**<0.05**
Yes					3.24	
COPE 2 – Concentrating efforts on doing something about the situation – Active coping						
No	1.18	**<0.05**	0.52	**<0.01**	0.79	**<0.01**
Yes	2.19		1.48		3.32	
COPE 5 – Getting emotional support from others – Emotional support						
No	1.2	**<0.01**	0.45	**<0.01**	1.96	**<0.01**
Yes	3.04		2.29		3.87	
COPE 6 – Giving up trying to deal with it – Behavioural disengagement						
No			0.75	**<0.05**		
Yes			2.43			
COPE 7 – Taking action to try to make the situation better – Active coping						
No	0.68	**<0.01**	0.15	**<0.01**	0.89	**<0.01**
Yes	2.48		1.68		3.44	
COPE 9 – Saying things to let my unpleasant feelings escape – Venting						
No	1.28	**<0.01**	0.58	**<0.01**	1.84	**<0.01**
Yes	3.75		2.95		5.05	

(Continued)

	Depression		Anxiety		Stress	
	Mean score	p	Mean score	p	Mean score	p
COPE 12 – Trying to see it in a different light to make it seem more positive – positive reframing						
No	1.12	**<0.01**	0.65	**<0.05**	1.38	**<0.05**
Yes	2.54		1.64		3.66	
COPE 13 – Criticizing myself – Self-blame						
No	1.40	**<0.01**	0.63	**<0.01**	2.26	**<0.05**
Yes	3.54		2.89		4.23	
COPE 14 – Trying to come up with a strategy about what to do – Planning						
No	1.00	**<0.01**	0.41	**<0.01**	1.06	**<0.01**
Yes	2.78		1.95		4.05	
COPE 19 – Doing something to think about it less, such as going to movies, watching TV, reading, daydreaming, sleeping, or shopping – Self distraction						
No	1.19	**<0.05**			1.63	**<0.01**
Yes	2.61				3.65	
COPE 20 – Accepting the reality of the fact that it has happened – Acceptance						
No					1.77	**<0.05**
Yes					3.17	
COPE 22 – Trying to find comfort in my religion or spiritual beliefs – Religion						
No	1.18	**<0.05**	0.52	p<0.01	1.45	**<0.01**
Yes	2.26		1.54		3.25	
COPE 24 – Learning to live with it – Acceptance						
No					1.58	**<0.01**
Yes					3.41	

(Continued)

	Depression		Anxiety		Stress	
	Mean score	p	Mean score	p	Mean score	p
COPE 25 – I've been thinking hard about what steps to take (planning)						
No					1.50	**<0.01**
Yes					3.73	
COPE 26 – Blaming myself for things that happened – Self-blame						
No					2.38	**<0.05**
Yes					4.45	
COPE 27 – Praying or meditating – Religion						
No	1.40	**<0.05**	0.65	**<0.01**	2.12	**<0.05**
Yes	2.73		2.05		3.65	

Discussion

International work on the psychological impact during quarantine has reported that the prevalence of depression ranges between 13.6%-53.1, and the prevalence of anxiety to ranges from 12.9% - 60.3% (2, 21, 22). The levels of depression, anxiety and stress in our study were much lower, and this may be due to several reasons. Firstly, the present study was done from April to July 2020, where only 2814 cases of COVID were reported in the country. Poor quality of life within the quarantine centers and lack of access to medical care is known to be associated with higher levels of psychological distress for those in quarantine centers (2). However, due to the low number of reported cases, there was minimum over crowding at the quarantine centers at the time of this study, making it less likely for participants to experience lack of essential care. Secondly, unlike in-home quarantine, during institutional quarantine people did not have to worry about their basic needs such as access to food, water and healthcare, since basic needs and medical services were provided free within the centers. In addition, previous literature has shown that access to leisure activities and having contact with family is associated with lower levels of distress (7, 23, 24). In our study, more than 90 percent had access to leisure activities and had contact with family, which may have been associated with lower levels of distress.

Levels of depression, anxiety and stress were higher among females, in keeping with previous studies (4, 19, 25). In contrast to most studies, other socio-demographic details such as age, marital status or education level was not associated with a negative psychological impact in our study. This was consistent with one previous study by Ma et al (26). Our study found higher levels of stress among those who had physical comorbidities. The awareness that physical comorbidities is associated with higher mortality in those with COVID-19, may have made those with physical comorbidities especially vulnerable to stress about acquiring the disease while in quarantine.

The current study found that problem focused coping strategies such as concentrating efforts on doing something about the situation, taking action to try to make the situation better, trying to come up with a strategy about what to do, and thinking hard about what steps to take to solve the problem was associated with higher levels of depression, anxiety and stress. Although problem focused coping strategies are generally believed to be associated with lesser psychological distress, some studies have suggested that these strategies may be harmful in situations which a person is unable to change or control (13). Since mandatory quarantine can also be considered a situation that is beyond the individuals' control, this may explain the higher levels of distress seen in those who used these problem focused strategies. Venting and self-blame were also associated with higher levels of psychological distress in our study, which is consistent with research showing disengagement coping strategies such as self-blame and venting to be associated with higher psychological distress (27, 28). Although substance use is a common coping mechanism, it was the least used coping mechanism in the present study, probably because the quarantine centers were supervised

by the Ministry of Defense and no substances were permitted into the quarantine centers. Using substances as a coping strategy is associated with higher rates of psychological problems (13). Lack of access to substances may also have contributed to the lower rates of psychological distress in our study.

In contrast to previous work, reduction of psychological symptoms on followup in our study suggests that the negative psychological effects associated with institutionalized quarantine are not long lasting and are likely to improve without targeted mental health interventions (8, 9). Given that the DASS-21 is a screening tool and not a diagnostic tool, it has limitations in differentiating whether the depressive and anxiety symptoms detected during quarantine meets the criteria for a depressive or anxiety disorder. As our findings indicate that these symptoms resolved spontaneously with time, the mental health consequences of quarantine may be categorized as an adjustment reaction. Another possibility is that our findings at 6-months were influenced by the high attrition rate (40%) - those who were depressed or anxious at followup may have been less likely to participate in followup interviews.

This study was done in those quarantined before the peak number of cases was reached in the country. Therefore, psychological consequences in those quarantined later, when the patient numbers were higher may differ from the current findings. As the psychological distress experienced by our study participants was much lower compared to other settings, further studies are needed to identify factors that contributed to this difference, in order to tailor the quarantine services accordingly.

Limitations

This study examined the psychological effects of quarantine in the period prior to the peak in the number of cases of COVID-19 in Sri Lanka. Therefore, it may not reflect the psychological impact of quarantine where there was a greater number of cases. In addition, this study was carried out among those who underwent institutional quarantine and does not reflect the psychological impact of home quarantine. The fact that 40% of the participants could not be contacted at 6-months followup is also a limitation.

Conclusions

The levels of depression, anxiety and stress in this study was much lower than in previous literature and improved without specific interventions. Further studies are needed to determine the reasons for lower psychological distress in this population.

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None.

Statement of contribution

All authors were responsible for the conception and design of the work. YR analyzed and interpreted the data and drafted the work. All authors revised it critically for important intellectual content, approved the final version to be published and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Conflicts of interest

None declared.

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