Public Health Section

Quarantine of Travellers during the Initial Phase of the COVID-19 Pandemic- Experience from a Rural Setting in Kerala, India

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ABSTRACT

Introduction: Quarantine of travellers was one of the major public health strategies enforced by the state to curb the transmission of the Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) in the initial phases. Proper quarantine requires commitment from the person, support and monitoring from the public health system.

Aim: To understand the process, practices, perceptions, and difficulties of quarantined persons during the initial phase of the Coronavirus Disease-2019 (COVID-19) in a panchayat in Alappuzha, Kerala, India.

Materials and Methods: A cross-sectional study was conducted from May to September 2020 using a semi-structured questionnaire through telephonic interview among quarantined individuals in a panchayat in Alappuzha, Kerala, India. Quarantine practices, the process of quarantine, perceptions and difficulties faced were explored to understand their viewpoint. The perceptions of the healthcare providers were also enquired qualitatively. The data collected was entered in Microsoft excel and statistical analysis was done using the Statistical Package for the Social Sciences (SPSS) version 27.0 (SPSS Inc, Chicago, USA).

Results: Out of the 182 quarantined individuals, 152 were in home quarantine of which 89 (58.6%) observed strict room quarantine and 132 (72.5%) had a quarantine period of more than 14 days which was the guideline then. Majority were contacted by the health staff during the period; however, 28% were not satisfied with the information that was conveyed to them. Majority adhered to infection control guidelines during quarantine. Almost half (46.7%) of them reported emotional problems during quarantine of which the major issues were loneliness and lack of social contact. Almost one-third of them had experienced stigma and rejection from people in the neighbourhood.

Conclusion: Quarantine to be used effectively as a public health measure requires that the concerns and problems should also be taken care of. Adequate information regarding the need and process of quarantine should be provided and there should be a system to cater to the emotional concerns of the persons. Awareness regarding the purpose and role of quarantine among the general public will enable quarantine to be used as a powerful tool for disease control in the future.

Keywords: Coronavirus disease-2019, Perceptions, Severe acute respiratory syndrome coronavirus-2

INTRODUCTION

The Coronavirus Disease-2019 (COVID-19) pandemic had imposed several challenges on the health system and cautioned a wind of change in all infectious disease prevention and control strategies worldwide. Various measures like physical distancing, contact tracing, quarantine and personal protective measures were used as effective strategies to hinder the spread of the disease [1,2]. Quarantine policies were constantly changing from time to time and this had in fact raised doubts on the utility of the public health measure.

Quarantine is the term that refers to the policy that separates and restricts the movement of people who are exposed to a communicable disease to detect the development of symptoms and thus prevent transmission of disease from those potentially incubating it [3]. The World Health Organisation (WHO) has recommended a strategy of 14 day quarantine either as a consequence of travel or following exposure to an infected person for effective control of COVID-19 [4]. India had been using quarantine effectively as a tool to fight the disease ever since the first case was detected in the country on 30th January 2020. Quarantine is combined with entry and exit testing and a positive test demands isolation of the affected person till recovery. The recommended 14 day quarantine period although caused tremendous strain on the physical and mental wellbeing and the economic stability of the person, it had been considered as the most important strategy to prevent transmission of the virus to an immunologically naive community.

The state of Kerala had used many innovative approaches and put up a timely and comprehensive response to the outbreak [5]. There was a system in place for screening and follow-up of every individual who arrived by air, sea, rail or road from other parts of India or abroad. The symptomatic passengers were taken directly to COVID treatment centres, tested and treated appropriately. The asymptomatic passengers were advised to follow strict home quarantine, avoid non essential travel and avoid social contact for the period of the quarantine [6,7].

The concept of good quality home quarantine requires awareness and commitment from the person and the family and a robust system to monitor the process. This was ensured by the frontline health workers with the help of volunteers and local panchayat leaders in the field. The field workers of the health system were responsible for the initial counselling, education and timely support to those in quarantine as and when needed. There was also a system in place to address the medical, nonmedical and psychological needs of the persons under quarantine through reassurance phone calls [8]. The details of the persons arriving in the state could be obtained from the COVID-19 Jagratha portal and the health staff promptly enquired about quarantine facilities at their homes much before they reached their homes [9]. People without quarantine facilities at their residence, those without exclusive bath attached rooms or those who had vulnerable individuals at home were offered quarantine facilities at institutions. Self-help groups, volunteers, the panchayat and the local police were involved with the health workers in monitoring quarantine violations in the area.

However, compliance with quarantine is not uniform and predictable and non compliance with the instructions and inability to enforce quarantine along with other control measures had resulted in clusters of outbreaks at many places [10]. This study attempted to understand the processes, perceptions and practices followed by people during quarantine and the difficulties faced during the initial phase of the COVID-19 pandemic in a panchayat in Alappuzha district, Kerala, India. The experience gained could be used for guiding policy decisions regarding quarantine in the public health system.

MATERIALS AND METHODS

This was a cross-sectional questionnaire-based study through telephonic interview among natives of Kerala who returned from abroad or other states and were in quarantine in the district of Alappuzha, Kerala, India. The study was initiated after obtaining Institutional Review Board and Ethics Committee approval (IEC 56/2020). The study period was five months from May to September 2020. The study participants were routinely contacted by the health staff of the health institution in the area and all necessary instructions were given and follow-up of their health status was performed. Some of them were tested for the SARS-CoV-2 using Real-Time-Polymerase Chain Reaction (RT-PCR) or quantitative RT-PCR (q RT-PCR) or Rapid Antigen Tests (RAT) and if tested positive, their contacts were put on quarantine and followed-up for another 14 days.

Study Procedure

Information was collected from those under quarantine at the end of their quarantine period using the questionnaire by telephonic interview by the investigators. Multiple conversations with the same person during the quarantine period helped in creating rapport with the persons in quarantine and helped in collecting the information on quarantine practices followed during the period of quarantine. A self prepared semi structured questionnaire was used to collect information on the demographic profile, country or state from which they arrived, the place and period of quarantine, the practices during quarantine, any problems faced and the kind of support received and their perceptions about quarantine. The perceptions of the medical teams regarding quarantine issues were also explored qualitatively through short personal interviews. These inputs gave useful insights from their viewpoint and can be considered as feedback for improvement and preparedness in the future.

STATISTICAL ANALYSIS

The data collected was entered in Microsoft excel and statistical analysis was performed using the Statistical Package for the Social Sciences (SPSS) version 27.0 (SPSS Inc, Chicago, USA). The results obtained were described using appropriate measures of central tendency or proportions. Informed verbal consent was recorded for telephonic interviews, confidentiality was maintained during all stages of the study and the data collected was used for the purpose of this study only.

RESULTS

Quarantine of travellers to the state was the main area of focus during the initial phase of the COVID-19 pandemic in Kerala and this strategy was well co-ordinated by the health systems with the active involvement of the local self-government and voluntary organisations in the community. The record of returnees to the state from COVID-19 affected countries and states was maintained at the health centres which helped in ensuring quarantine of all returnees and their contacts.

A total of 182 persons who returned to their home town in the district of Alappuzha and were in quarantine were studied, of whom 142 (78%) were men. The mean age (SD) of the study population was 35.92 (11.54) years. A majority 126 (69.2%) of

the study population belonged to 18-40 year age group. One half i.e. 93 (51.1%) individuals under quarantine were international travellers and the rest were domestic travellers from other states in the country [Table/Fig-1].

Characteristics	Study population, n (%)
Age group	
1-17 years	3 (1.6%)
18-40 years	126 (69.2%)
41-60 years	46 (25.3%)
Above 60 years	7 (3.8%)
Gender	
Male	142 (78%)
Female	40 (22%)
Education	
Up to class 12	54 (29.7%)
Graduate	122 (67%)
Postgraduate	6 (3.3%)
Occupation	
Administrative work	15 (8.2%)
Engineering	77 (42.3%)
Business	45 (24.7%)
Health sector	12 (6.6%)
Education sector	6 (3.3%)
Student	11 (6%)
Not employed	16 (8.8%)
Travel history	
International	93 (51.1%)
Domestic	89 (48.9%)
Reason for travel	
COVID-19 cases increasing	30 (16.5%)
To join family at home	40 (22%)
Treatment purpose	12 (6.6%)
Job loss due to COVID-19	64 (35.2%)
College/hostel closed	11 (6%)
Availed leave	25 (13.7%)

[Table/Fig-1]: Demographic and epidemiological profile (N=182).

A majority 128 (70.3%) were graduates and postgraduates in qualification and 122 (67%) were employed in the engineering and business sectors. A majority of them 126 (69.3%) had returned to Kerala immediately after the nationwide lockdown was lifted in the months of May and June 2020. The major reason for their return to Kerala was loss of job due to COVID-19 in 64 (35.2%) and the fear of COVID-19 as cases were increasing in 30 (16.5%). More than half of the study participants i.e. 104 (57.1%) were tested for COVID-19 by qRTPCR or RAT of which 23 (22.11%) were positive [Table/Fig-1].

A total of 30 (16.5%) participants were in institutional quarantine at COVID-19 care centres for the entire quarantine period, whereas 32 (17.5%) were in institutional quarantine for 7-14 days and then in home quarantine for the rest of the period. Out of the 152 study participants who were advised home quarantine, 89 practiced strict room quarantine, whereas 63 stayed at home along with the family members and not in strict room quarantine. A majority 132 (72.5%) had a quarantine period of more than 14 days and 50 (27.5%) were in quarantine for 14 days only [Table/Fig-2].

About one half 92 (50.5%) of the study participants were contacted before the quarantine period by the healthcare staff, majority 178 (97.8%) were contacted during their quarantine period, and 124 (68.1%) were contacted by the staff even after completion of their quarantine period. Majority 106 (58.2%) were contacted by only phone calls at least once a day during the quarantine period.

| Characteristics	Study population, n (%)
Type of quarantine (n=182)	
Home quarantine	120 (65.9%)
Institutional quarantine at COVID-19 care centres	30 (16.5%)
Institutional quarantine first and then home quarantine	32 (17.5%)
Type of home quarantine (n=152)	
Strict room quarantine	89 (58.6%)
Mingled with family	63 (41.4%)

[Table/Fig-2]: Type of quarantine (N=182).

Overall, 100 (54.9%) were contacted by officials from the district level (District Nodal Officers, Collectorate control room, Mental Health Counsellors) during their quarantine [Table/Fig-3].

Characteristics	Frequency, n (%)
Time of contact by healthcare staff	
Before quarantine	92 (50.5%)
During quarantine	178 (97.8%)
After quarantine	124 (68.1%)
Mode of contact by healthcare staff during quarantine	
Phone call	106 (58.2%)
House visits	14 (7.7%)
Both phone call and house visits	58 (31.8%)
Not contacted	4 (2.2%)
Frequency of contact	
Once a day	81 (44.5%)
Once in two days	71 (39%)
Less frequent	26 (14.3%)
Not contacted	4 (2.2%)
Contacted by Accredited Social Health Activist (ASHA) during quarantine	
Contacted	165 (90.7%)
Not contacted	17 (9.3%)
Contacted by district control room	
Contacted	100 (54.9%)
Not contacted	82 (45.1%)
Information shared by health staff	
Satisfied that all information was given	131 (72%)
Some information was not given	17 (9.3%)
Not informed about quarantine certificate	34 (18.7%)

[Table/Fig-3]: Communication with the health system (N=182).

Majority of the people in quarantine 131 (72%) were satisfied that all information regarding quarantine was conveyed to them by the healthcare staff though some of the study participants 34 (18.7%) felt that all information, except quarantine certificate, was informed to them and 17 (9.3%) felt that information in many areas was inadequate. The most common information not shared was about the details and process of quarantine certificate, which was vital for those in employment [Table/Fig-3,4].
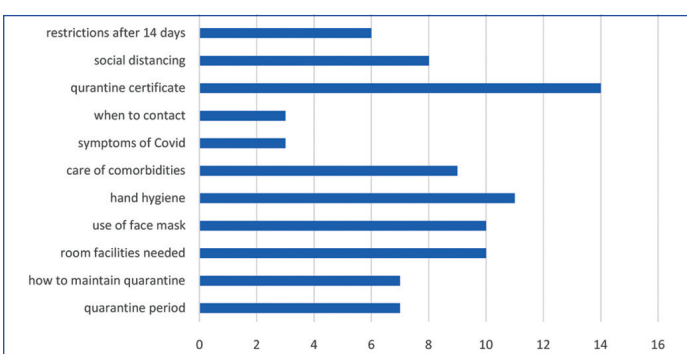
[Table/Fig-4]: Information expected but not received by quarantined individuals (n=17).

Persons in quarantine were instructed to use masks, practice hand hygiene measures and stay separated from others. One-half of the study participants 90 (49.5%) used mask occasionally during quarantine, although they were advised to use them throughout. Majority of them 166 (91.2%) practiced hand hygiene measures always. Majority of the persons in quarantine 64 (35.2%) used cloth masks and 55 (30.2%) used triple layer surgical masks. The practice of double masking was followed by 39 (21.4%) of the study population. About three quarter of the persons in quarantine 133 (73.1%) were in the habit of washing and reusing their masks [Table/Fig-5,6].

Practices	Always, n (%)	Occasionally, n (%)	Never, n (%)
Wearing mask	78 (42.9%)	90 (49.5%)	14 (7.7%)
Hand hygiene measures	166 (91.2%)	16 (8.8%)	
Physical distancing measures	158 (86.8%)	8 (4.4%)	16 (8.8%)
Spitting in open places	4 (2.2%)	2 (1.1%)	176 (96.7%)
Practicing cough etiquette	164 (90.1%)	13 (7.1%)	5 (2.7%)

[Table/Fig-5]: Practice of following guidelines during quarantine (n=182).

Type of mask used	Frequency, n (%)
Cloth mask	64 (35.2%)
Triple layer mask	55 (30.2%)
N-95 mask	24 (13.2%)
Double masking-cloth and triple layer mask	26 (14.3%)
Double masking-triple layer and N-95 mask	13 (7.1%)
Mode of disposal/reuse	
Burning	49 (26.9%)
Washing and reuse	133 (73.1%)
Use of mask after quarantine	
Continuing to use	176 (96.7%)
Not using	6 (3.3%)

[Table/Fig-6]: Use of masks during quarantine (n=182).

Almost 85 (46.7%) had emotional concerns during their quarantine, of which loneliness and lack of social contact were the most frequent. They had also encountered lack of sleep, sadness and grief on being alone and lack of good food. A major proportion of the study participants 176 (96.7%) had access to things happening around through phone calls and social media. Majority 137 (75.3%) were of the opinion that being able to communicate with others and being aware of things happening around had a positive impact on them during the period. A small proportion 23 (12.6%) said they were concerned about misinformation circulating regarding the disease [Table/Fig-7,8].

Characteristics	Frequency, n (%)
Any concerns during quarantine	
Had problems	85 (46.7%)
Did not face any problems	97 (53.3%)
Problems faced (n=85)	
Loneliness	42 (49.4%)
Lack of social contact	40 (47%)
Sadness	36 (42.3%)
Lack of sleep	30 (35.25%)
COVID-19 testing not done	25 (29.4%)
Lack of good food	19 (22.3%)
Did not get non communicable disease medicines	4 (4.7%)

[Table/Fig-7]: Problems during quarantine (n=182).

Among the 182 respondents, 84 (46.2%) thought they would get SARS-CoV-2 infection if they had remained in that country or state. A large proportion of them 151 (83%) considered Kerala a

Communication channels	Frequency, n (%)
Phone and social media	176 (96.7%)
Newspaper	23 (12.6%)
Television	62 (34.1%)
Impact of being connected	
Positive impact	137 (75.3%)
Mixed feelings	39 (21.4%)
Concerned about misinformation	23 (12.6%)
[Table/Fig-8]: Communication during quarantine (n=182).	

safe zone in this pandemic. Almost all of them 181 (99.5%) were convinced that quarantine was a public health measure to protect their families, whereas 161 (88.5%) of them thought that they were asked to remain in quarantine as they were infected with the virus. A small proportion of them i.e. 63 (34%) feared stigma and rejection from people in the neighborhood. All of them were convinced that quarantine would stop the spread of the pandemic [Table/Fig-9].

Perceptions	Frequency, n (%)
Feared they would get COVID-19 infection if they had not returned to Kerala	84 (46.2%)
Considered Kerala a safe zone in this pandemic	151 (83%)
Quarantine is a public health measure to protect their families	181 (99.5%)
Quarantine was imposed on them as they were infected	161 (88.5%)
Fear stigma and rejection in the neighborhood due to quarantine	63 (34.6%)
Quarantine can stop the spread of the COVID-19 pandemic	182 (100%)
[Table/Fig-9]: Perceptions about COVID-19 and quarantine (N=182).	

DISCUSSION

Quarantine as a public health measure to control the spread of an infectious disease was evident during the SARS outbreak [11]. During the initial phase of COVID-19 in the state, it was important to follow the principles of quarantine and physical distancing to control the spread of the disease. Strict enforcement of home quarantine or institutional quarantine is possible only with good rapport with the health system and the local self-government [12]. Communication with the health staff is essential to disseminate instructions to them, to spread awareness regarding quarantine, and to ensure adherence to the quarantine guidelines.

Quarantine of international and domestic travellers was a major public health measure initiated by the state to control the spread of the pandemic. This was of utmost importance as one of the main challenges Kerala had to face in the initial phase was the inflow of expatriates returning to their homeland due to several reasons and the large number of foreign tourists visiting the state [8]. Evidence suggests that the disease is transmitted more by pre-symptomatic and asymptomatic individuals and hence, quarantine enforced in people with high risk, like travellers coming from high burden countries had a definite advantage [13]. This strategy had prevented the spread of the disease to family members and close contacts in the state [14]. The study brings to light that almost one half of the people in quarantine were international travellers and the major reason for the travel had been the loss of jobs due to COVID-19 and fear of contracting the disease in a distant land. There was a good system to monitor and guide the people in home quarantine through the field staff, community health volunteers and the local self-government. The persons in quarantine need to be informed about the maintenance of strict quarantine, the symptoms, whom to contact and when, the restrictions to be continued and about the quarantine certificate. Lack of clarity regarding the guidelines and inadequate information had created difficulty in complying with the instructions [15]. Majority of the quarantined persons had a quarantine period of more than 14 days in the initial phase and the duration of quarantine is a reason for stress among them. Restricting the duration of quarantine to the most reasonable one

and not adopting an over precautionary approach will be beneficial [15]. Hand hygiene and face masks are considered powerful precautionary weapons in the fight against the disease [16]. The persons in quarantine need to strictly follow the guidelines regarding the use of mask, hand hygiene, cough etiquette and physical distancing as these measures reduce transmission to others [17].

Quarantine is an unpleasant experience for most people and mental wellbeing of the quarantined persons is an important factor to be considered during the quarantine period. Many studies have reported cases of anxiety and depression during the previous outbreaks also [18,19]. The communication channels with the health system need to be smooth to detect any aberration in their mental status or any concern that needs to be addressed, as loneliness and lack of social contact have disturbed many persons during quarantine [20]. Frequent telephone calls from the higher levels like the district administration and the mental health programme may be strengthened to help quarantined persons in distress. The ability to communicate with one's family and friends and the role of social media in helping people to update their loved ones about their situation and reassure them has to be emphasised. Being separated from family, the fear of contracting the disease, and the stigma associated with quarantine in the early days could be reduced by maintaining clear lines of communication with the quarantined persons and by spreading awareness about quarantine and its role in disease control to the general public. Successful use of quarantine as a public health measure in future requires policymakers to understand the psychological impact of quarantine and provide clear rationale for quarantine and the experience gained so far can guide policy decisions in future public health emergencies.

Limitation(s)

As the study participants were on quarantine, the information could be collected by telephonic interview only. The information from all travellers could not be enquired due to technical reasons like wrong phone number entered in portal.

CONCLUSION(S)

Quarantine to be used effectively as a public health measure requires that the concerns and problems should also be taken care of. Adequate information regarding the need and process of quarantine should be provided and there should be a system to cater to the emotional concerns of the persons. Awareness regarding the purpose and role of quarantine among the general public will enable quarantine to be used as a powerful tool for disease control in the future.

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