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Contact Tracing during COVID-19 Pandemic in Southeast of Iran

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Abstract

Aims: Contact tracing is a critical method to control the spread of SARS-COV-2 and intervention and feasible control of the pandemic. This is the key strategy for breaking the outbreak transmission and reducing the mortality associated with the pandemic. Contact tracing includes the processes of identifying, assessing, and managing people who have been exposed to SARS-COV-2 and prevention of COVID-19 onward transmission. In this investigation, 4500 confirmed SARS-COV-2 patients and their contacts in different areas of Jiroft city (City of the Kerman province), and all the data from contact tracing was analyzed.

Instrument & Methods: This longitudinal study was conducted from February to October 2020. We reported contacts of 4500 COVID-19 index patients in different areas of Jiroft city. All the data from contact tracing were analyzed.

Findings: The widespread transmission of SARS-COV-2 and guide the public health response of the contacts are related to household contacts, and most non-household contacts are related to contacts with colleagues and friends.

Conclusion: Most contacts are related to non-household contacts, and most of the non-household contacts are related to contacts with colleagues and friends. Personal hygiene and social distancing are critical points for the prevention of COVID-19.

Keywords
Contact Tracing [https://www.ncbi.nlm.nih.gov/mesh/68016358];
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Introduction

The novel coronavirus disease (COVID-19) is caused by severe acute respiratory syndrome coronavirus-2. This major epidemic took off from China, quickly sparked globally, and observed many cases across borders. Due to multiple local and global transmissions expanded worldwide, the World Health Organization (WHO) characterized this major epidemic as a pandemic on March 11, 2020. Moreover, the global pandemic of severe acute respiratory syndrome (SARS-COV-2) pandemic has infected millions of people and victims globally [1] and caused at least 2,347,015 mortality and morbidity [2]. For understanding the best ways to control SARS-COV-2 pandemics, different features were considered, such as the ability to isolate symptomatic individuals [3, 4], significant portions of asymptomatic cases [5, 6], and tracing and quarantining the symptomatic instances [7]. According to the attributes of pandemics, infectious cases are cleaved into two significant parts. Severe acute caused by SARS-COV-2 is known to have been chiefly accompanied by clinical symptoms [8, 9] and very few asymptomatic cases infected with SARS-COV-2; the rate of asymptomatic patients is minimal compared to symptomatic [8].

Contact tracing and containment must be controlled and maintained low to prevent the spread of SARS-COV-2 and intervention and feasible control of the pandemic [7]. This is the critical strategy for breaking the outbreak transmission and reducing the associated mortality during the pandemic. Contact tracing includes identifying, assessing, and managing people exposed to SARS-COV-2 and preventing COVID-19 onward messages [1]. This process provides information collection of health communication by identifying and testing contact persons diagnosed with symptomatic and asymptomatic COVID-19 infection for separation and isolation and stop the COVID-19 transmission with quarantine and isolation.

In this investigation, 4500 confirmed SARS-COV-2 patients and their contacts in different areas of Jiroft city (City of the Kerman province), and all the data from contact tracing was analyzed.

Instrument and Methods

This study was conducted at the Jiroft University of Medical Sciences, designated to treat COVID-19 patients. It was performed from February to October 2020. Patients were hospitalized in three COVID-19 dedicated units; Infectious Disease, Internal Medicine, and Intensive Care Unit.

A total of 4500 cases were reported in this study. According to the World Health Organization guidance, the data was collected from those diagnosed with COVID-19 [10]. Moreover, a molecular laboratory test for SARS-COV-2 and radiological confirmation of COVID-19 infection was performed. The information and variables of cases were collected by a standard checklist that confirmed its validation by Iran's health and education ministry. These variables included demographic variables and contact information. The contacts were traced as two main groups, including the high-risk contacts and non-high-risk contacts. The high-risk contacts had household contact with COVID-19 patients (the household contacts will be defined as someone who lived or spent more than 12 hours with a confirmed COVID-19 patient.) and healthcare personnel. The Non-high-risk contacts included asymptomatic persons; symptomatic persons were tested, and non-household contact groups such as friends and social communities followed the health protocols. The descriptive statistics report was used for quantitative variables: mean, frequency, percentage, and ratio. The analytical analysis was performed using Logistic regression. The data were entered and analyzed using SPSS 21 software. In all tests, $p<0.05$ was considered a significant level.

Findings

Participants were divided into five groups by age; children (5 years), adolescents (6-17 years), young (18-29 years), middle-aged (30-59 years), and elderly (≥60 years). Moreover, 2537 (56.4%) COVID-19 patients were middle-aged, 998 (22,2%) were older than 60 years, 864 (19.2%) were young, 70 (1.6%) were adolescents, and 31 (0.7%) belonged to children (0-5 years) group. Moreover, from 4500 patients from different living areas of Jiroft city, 1730 (38.4%) patients were from rural areas, while 2770 (6.61%) patients were from urban areas. From the total patients referred to the hospital, a slight majority of 2588 (57.5%) received health care services on an outpatient basis, while 1912 (42%) of patients belonged to children and elderly patients were hospitalized (Table 1).

Table 1. Number (parentheses are percentages) of clinical status in different age ranges and contact groups

Parameter	Outpatients	Hospitalized
Age		
Children (0-5 years)	7 (22.6)	24 (77.4)
Adolescents (6-17 years)	41(58.6)	29 (41.4)
Young (18-29 years)	665 (77)	199 (23)
Middle-aged (30-59 years)	1546 (60.9)	991 (39.1)
Elderly (over 60 years)	329 (33)	669 (67)
Contact Groups		
Family members	462 (39.9)	286 (63.6)
Relatives	121 (10.4)	80 (17.8)
Friends/Colleagues	419 (36.2)	40 (8.9)
Neighbors	35 (3)	13 (2.9)
Others	121 (10.4)	31 (6.9)

1608 of 4500 contacts were monitored. COVID-19 patients confirmed severe acute respiratory syndrome coronaviruses 2 (SARS-COV-2) infection.

Among the 4500 patients in this study, 2892 (64.3%) patients were reported without any contact with confirmed or symptomatic cases of COVID-19. While 1153 (25.6%) patients were reported to have contact

cases with confirmed COVID-19 or symptomatic persons. Of these persons, 423 (9.4%) reported contact with symptomatic persons, and 32 (0.7%) were confirmed COVID-19 and hospitalized.

From total contacts, 748 (46.5%) were related to household contacts, and 860 (53.5%) were associated with non-households. Of real non-household connections, 459 (28.5%) related to colleagues and friend communities, 201 (12.5%) contacts were related to relative communities, 48 (3%) were contacted with neighbors, and 152 (9.5%) were approached with others reported.

Of the COVID-19 patients without contact backgrounds, 15 (5%) were decelerated; they had an international trip experience, and 465 (16.1%) had a minimum of one domestic trip. In comparison, 918 (31.7%) persons were referred to the medical center for other causes except COVID-19. And, 693 (22.4%) were attended meetings and socials communities, 384 (13.3%) were in crowded places, 1339 (46.3%) were health care workers, 152 (5.3%) in a household with health care workers, 1339 (46.3%) were in public places, 384 (13.3%) were in contact to domestic and wild animals, 173 (6%) patients with a background of consumption of unpasteurized dairy products, and 651 (22.5%) did not care personal hygiene and social distances. Most contacts belonged to children restricted in household contacts (Table 2).

The patients who were treated as outpatients were reported to contact the confirmed patients with COVID-19 462 (39.9%), while 286 (63.6%) patients hospitalized in the hospital for treatment of coronaviruses pneumonia were patients with COVID-19 in the family members. Our finding indicated that contact with the patient's family members had a significant relation with treatment status; in other words, the chance of hospitalization of the patient who had contact with a confirmed patient with COVID-19 in one home is 2.63 times (CI 95%: 2.10-3.29) persons who had contact with other patient persons ($p<0.01$).

Table 2. Contacts traced by age group of coronavirus disease patients (parentheses are percentages)

Groups	Family members	Relatives	Friends/Colleagues	Neighbors	Others
Children (0-5 years)	8 (72.7)	3 (27.3)	0 (0)	0 (0)	0 (0)
Adolescents (6-17 years)	19 (79.2)	3 (12.5)	1 (4.2)	1 (4.2)	0 (0)
Young (18-29 years)	135 (37.4)	31 (8.6)	127 (35.2)	9 (2.5)	59 (16.3)
Middle-aged (30-59 years)	420 (42.6)	128 (13)	327 (33.2)	29 (2.9)	82 (8.3)
Elderly (over 60 years)	166 (73.5)	36 (15.9)	4 (1.8)	9 (4)	11 (4.9)

Discussion

The study presented COVID-19 in 53.5% of non-household contacts; the rates were higher for public communications contacts. While COVID-19 was detected in 46.5 % of household contacts, this rate is higher for connections of children and elderly than in other age groups. These risks primarily reflected transmission during mitigation when schools and universities are closed [11]. Both household and non-household contacts may remember messages during social distancing, in household contacts when family members mostly stay home and are left to perform essential tasks, possibly creating spread within the household.

According to this study's results, most patients hospitalized for coronavirus treatment were in contact with patients with COVID-19 in the family members. In contrast, in patients treated on an outpatient basis, contact with a COVID-19-confirmed patient was less reported. Park et al. note in their study that higher household than non-household detection might partly reflect transmission during social distancing, when family members largely stayed home except to perform essential tasks, possibly creating a spread within the household [12].

According to the results of this study, it was found that most contacts belonged to children restricted in household contacts. On the other hand, the age profile of PCR-confirmed infections in Shenzhen indicates that children are as susceptible to SARS-CoV-2 infection as adults. However, they are less likely to display symptoms [13].

In this study, most people infected with coronavirus were healthcare workers and people working in public places. Other studies show that healthcare personnel are at high risk for the disease [12].

In this study, most contacts are related to non-household connections, and most non-household communications are connected to contacts with colleagues and friends. Althoff et al., In their study, reported a very high proportion of households leading to SARS-CoV-2 [14]. The WHO also states that close friends, classmates, and family members are at increased risk for transmitting coronavirus [1]. Moreover, most patients reported having no contact with someone with a coronavirus or a symptom. A study by Kinoshita et al. It also found that the transmission of coronavirus infection was very high in asymptomatic people and that most people with coronavirus had no contact with a person diagnosed with coronavirus [8].

Conclusion

Household and non-household contacts may reflect transmission during social distancing; in household contacts, family members mostly stayed home and were left to perform essential tasks, possibly creating spread within the household.

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