The Extent of Commitment of Saudis During Holy Ramadan to Social Distancing Measures Required for the Prevention of Transmission of COVID-19

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Abstract

Coronavirus disease (hereafter COVID-19) was declared a pandemic by the World Health Organization (WHO) in March 2020. People were admitted to hospitals complaining of fever, fatigue, cough, and difficulty breathing. Consequently, the strategy being adopted to limit the spread of COVID-19 is to encourage people in society to follow preventive measures. We aimed to estimate how the knowledge of and compliance with safe distancing measures affected the progression of the COVID-19 pandemic in Saudi Arabia during Holy Ramadan. A cross-sectional survey was implemented in the central regions of Saudi Arabia from 24th of April to 22nd May to coincide with Ramadan. The study was conducted using a Google forum distributed through social media. Participants were recruited through convenience sampling of the Saudi population. In total, 1515 participants completed the survey. A significant difference between males and females was observed in answering questions about committing to: not attending gatherings, keeping a safe distance, not making physical contact, and staying at home during partial lockdown. In general, participants in our study demonstrated excellent adherence to all social distance measures, considered essential for limiting the spread and progression of COVID-19. However, attitudes regarding reduced physical contact was poor in the Makkah region, which necessitates greater efforts to educate and inform people about the associated risks.

Keywords COVID-19 · Saudi · Ramadhan · Pandemic · Social distance

Introduction

Coronavirus disease (COVID-19) was declared a pandemic by the World Health Organization (WHO) on March 11, 2020 [1]. The newly discovered virus first emerged in Wuhan City, in the Hubei Province of China at the end of December, 2019 [2, 3]. People in Wuhan were being admitted to hospitals, complaining of fever, fatigue, cough, and difficulty breathing. Furthermore, the symptoms of the illness ranged from mild to severe, in certain cases leading to respiratory failure and death [2–6]. The main features were identified as a severe acute respiratory syndrome [1, 3, 5, 6]. The number of people infected in Wuhan increased tremendously [7], and the outbreak of the virus has continued to spread around the world with people from many countries suffering the loss of loved ones and challenging financial circumstances [6, 8, 9]. People identified with high potential risk factors for severe COVID-19 are the elderly, those with chronic lung disease, cardiovascular disease, diabetes mellitus, people who are immunocompromised, and pregnant women [7, 8, 10].
Symptoms have been observed to appear in people 1 week following exposure to the disease who then become infected [11]. To date, there is no therapeutic cure for COVID-19 and no vaccine to prevent infection [5, 6, 12]. The National Institutes of Health are currently working to develop a vaccine [10]. In late January 2020, it was confirmed that this infection could transmit from person to person, especially when there has been close contact with infected individuals within 14 days of the onset of symptoms [5, 10, 13, 14]. In addition, it has been established that infection can transfer from a person carrying the virus without demonstrating signs or symptoms of infection (asymptomatic) [15].

To limit the spread of COVID-19 infection, the strategy being adopted is to encourage people to follow preventive measures, which include observing proper hand hygiene (every 15–20 min), refraining from hands shakes, maintaining social distancing, avoiding crowded places, and observing quarantine protocols. Furthermore, closing public places such as schools, restaurants, barbershops, and workplaces whilst letting people work remotely from home have also been introduced to reduce the spread of the virus [2, 9, 12, 13, 16, 17].

On March 2, the Saudi Ministry of Health (MOH) announced the country’s first case of COVID-19. As part of an awareness campaign to prevent its spread [18], Saudi authorities announced a lockdown in mid-March 2020, banning people from all gatherings (such as gyms, malls, funerals, weddings, and other social events). This was followed by the closure of cinema theatres, coffee shops, and restaurants.

In this study, we surveyed a sample drawn from Saudi society, asking several questions to determine the extent of their commitment to social distancing measures, such as not attending gatherings outside their homes, maintaining a safe distance from others, having no physical contact (such as handshaking and hugging), not having meals with others, and staying home during partial lockdown. We aimed to determine how knowledge of and compliance with safe distancing measures during the COVID-19 outbreak. First, a draft of the study survey was revised by three academic specialists who reviewed it for any recommendations or modifications. Questions about social distancing were then revised according to the feedback.

The next step was to conduct a pilot study that was intended to test the questionnaire with 20 participants who were later eliminated from the overall sample. The initial pilot phase was conducted before the distribution of the main survey to assess the reliability and validity of the questionnaire. The data were used to assess the internal consistency (reliability) using Cronbach’s alpha. The outcomes showed acceptable internal reliability (Cronbach’s alpha = 0.82).

An online Google form was generated, and participants were asked to fill out and submit the survey. The sample size was determined using the Cochran’s sample size formula as follows: $n = \frac{Z^2 pq}{e^2}$. Because there have been no similar studies related to coronavirus disease, the calculations were based on an assumption that the probability of having good knowledge of COVID-19 social distancing guidance was 50% [19] at a 99% confidence interval, with $Z_2$ as the square of confidence level at 99% from the normal table (2.575), and a margin of error of 3.31. The required sample size was calculated to be 1513 participants, and we recruited 1515 participants. The survey portal was then closed.

Descriptive statistics were used to summarise socio-demographic characteristics of the data and the responses to questions concerning knowledge about social distancing guidance. The data were summarised as frequencies (n) and percentages (%) for the categorical variables. A chi square test was used where appropriate. All data analyses were performed using Statistical Package for the Social Sciences (SPSS) software, version 26. A value of $P < 0.05$ was considered statistically significant.

This study was approved by the Ethics Committee of Umm Al-Qura University. Respondents’ concealment and confidentiality were ensured. Submission of a completed questionnaire was considered consent to participate in the study.

**Methods**

A descriptive, cross-sectional, survey was conducted from 24th of April to 22nd May (Ramadan: 9th month of the Islamic calendar), as many gatherings usually occur during this month. The survey commenced from five mean points concurrently (Riyadh, Makkah, Almadinah, Jeddah, and others) randomly representing the central regions of Saudi Arabia. The survey was disseminated through links on social networking sites. We surveyed a convenience sample of participants drawn from the Saudi population.

**Results**

In total, 1515 participants completed the survey. Table 1 presents the demographic data for participants, of whom 403 (26.6%) were male and 1112 (73.4%) were female. In
terms of age, the largest proportion of participants was from the age group 19–40 years (n = 1287; 85%), while only 2 participants (0.1%) were aged older than 65 years. With regard to educational level, 1090 participants (71.9%) had a bachelor’s degree, while only 31 (2%) had a Ph.D. Most participants were from Riyadh (n = 632; 41.7%) and 334 (22%) were health workers, while 1181 (78%) participants were not health providers.

Table 2 demonstrates the frequencies and rates of responses for the survey questions. It was evident from participant responses that the majority were highly committed to all social distancing measures presented in the survey.

Table 3 illustrates differences in answers based on gender. A significant difference was observed between males and females when asked about committing to: not attending gatherings, keeping a safe distance, not making physical contact, and staying home during partial lockdown (p = < 0.001, p = < 0.001, p = 0.002, and p = < 0.001, respectively).

A demonstration of differences in responses based on age group are presented in Table 4. There was no observed significant differences between age groups for any of the questions.

Table 5 displays differences in answers based on educational level, indicating whether a significant difference between groups could be observed. A significant difference was observed when asked about commitment to: not attend gatherings (p = 0.002), not having meals with others (p = 0.035), and staying at home during partial lockdown (p = 0.005).

Table 6 presents differences in answers based on the city in which participants are living. A significant difference was evident when asked about a commitment to: keeping a safe distance, not making physical contact, and staying at home during partial lockdown, (p = < 0.014, p = < 0.001, and p = < 0.049, respectively).

Table 7 demonstrates differences between health workers and non-health workers. A significant difference was only observed when answering about commitment to not making physical contact (p = 0.001).

Discussion

The novel coronavirus disease COVID-19 was first identified during the outbreak of severe acute respiratory syndrome in Wuhan, China, in December 2019 [2, 20]. To date, more than 34 million people have been infected with COVID-19, with mortality of more than 1 million cases [21]. The first identified case in Saudi Arabia was on March 2, and by the end of May more than 85,000 cases had been identified with 503 deaths [22].

Saudi Arabia is the biggest country in the Gulf region, with a population of more than 34 million people [23]. Ramadan is the month during which the community reconnects with family, friends, and neighbours, showing appreciation and bonding together for a common spiritual cause.

Ramadan’s holy month is a distinct social and religious gathering where Muslims families and friends around the world unite to break their fast together in the evening at sundown (iftar) or before sunrise during (suhour). Many Muslims increase their attendance at mosques during the month and assemble for extended prayers (Taraweeh and qiyam). Some Muslims also spend days and nights at mosques for prayers, especially during the last days of Ramadan (i’tikaf). These spiritual practices are frequently observed throughout the month. This year, Ramadan falls between the 24th of April and the 23rd of May, just as the COVID-19 pandemic continues.

Transmission of COVID-19 occurs through contact between people as the virus is spread via respiratory droplets and contact with surface contaminants. To reduce the effect on public health, many countries have employed physical distancing actions intended to interrupt virus transmission by mitigating interaction between people. These measures present essential mechanisms to control the spread of infection, particularly respiratory infections, associated with large gatherings of people.

These distancing measures (including but not limited to the closure of mosques) prohibit public congregations and

Table 1  Demographic profile of the participants (N = 1515)

| Demographic characteristics | n  | %    |
|----------------------------|----|------|
| Gender                     |    |      |
| Male                       | 403| 26.6 |
| Female                     | 1112| 73.4 |
| Age                        |    |      |
| 19–40                      | 1287| 85   |
| 41–65                      | 198 | 13.1 |
| 18 and younger             | 28  | 1.8  |
| Older than 65              | 2   | 0.1  |
| Educational level          |    |      |
| High school                | 243 | 16   |
| Bachelor’s                 | 1090| 71.9 |
| Masters                    | 151 | 10   |
| Ph.D.                      | 31  | 2    |
| City                       |    |      |
| Riyadh                     | 632 | 41.7 |
| Jeddah                     | 157 | 10.4 |
| Makkah                     | 249 | 16.4 |
| Madinah                    | 43  | 2.8  |
| Other                      | 434 | 28.6 |
| Health worker              |    |      |
| Yes                        | 334 | 22   |
| No                         | 1181| 78   |
other limits on movement and will have direct consequences for the social and spiritual gatherings fundamental to Ramadan [24, 25]. In this paper, we present the results of our survey about the knowledge and adherence to social distancing during Holy Ramadan.

In our study, participants showed a generally positive attitude towards social distance measures, as almost three quarters of participants said they would never attend gatherings out of home after the lockdown, while 22% said they often stayed home, 3% said they would sometimes stay home, while just 0.5% took no precautionary measures. Approximately two thirds (64%) of participant maintained a safe distance from people, while almost 4% never take this precaution. More than 70% of our study population said they avoided handshaking and hugging during the virus outbreak period, while almost 4% did not avoid physical contact during the same period. Moreover, 85% of participants did not share meals with others, while almost 3% said they gathered and shared meals without any precautions. Regarding the partial lockdown, only 0.8% \((n = 12)\) of participants said they left their homes, which may indicate negligence concerning the importance of these precautions in limiting the viral outbreak.

### Knowledge of Social Distancing Measures Regarding Not Attending Gatherings Out of Home

In general, participants in our study were highly committed to all the social distancing measures, especially abstaining from gatherings out of home. Females were more committed to staying at home than males, as were people aged 41–64 years (92.8%) and people older than 65 years (100%), which may be because of a heightened risk of age-associated chronic diseases making them more likely to suffer severely from coronavirus, which increases the risk of corona-related morbidity and mortality—proven from multiple studies published about the disease in China [8, 9, 26, 27].

There were no differences identified between the educational level of the participants, region, and healthcare worker status regarding staying at home.

### Knowledge of Social Distancing Measures Regarding Maintaining a Safe Distance from Other People

Participants aged 41 years and over were committed to maintaining a safe distance with other people (75%); however,
this reduced to almost 60% for those younger than 40 years. Regarding educational level, participants with a Ph.D. degree were more aware of and adhered to safe distancing guidelines.

Interestingly, only 61% of healthcare workers have been maintaining a safe distance measure compared to 65% of non-healthcare workers. There is no difference in terms of knowledge of and adherence to safe distancing in different regions of Saudi Arabia, all of which showed almost 65% of participants.

### Knowledge of Social Distancing Measures Regarding Maintaining No Physical Contact (Like Handshaking, Hugging)

More than three-quarters of male participants (78%) maintain no physical contact, while a lower proportion was observed among females (69%). Participants less than 40 years old demonstrated good knowledge and attitude toward physical contact, with almost 80% having no physical contact at all.

In Makkah province, only 48% committed to no physical contact, which could account for the higher number of COVID-19 cases witnessed in Makkah. More than 80% of healthcare workers committed to no physical contact.

### Table 3 Gender-based comparison of answers (N = 1515)

| Answer | Male (n = 403) | Female (n = 1112) | Chi-square | P-value |
|--------|----------------|------------------|------------|---------|
| Q1/How much are you committed to the social distancing measure of not attending gatherings out of home? | | | | |
| Always | 261 64.76 | 866 77.88 | 32.168 | <0.001* |
| Often | 125 31.02 | 209 18.79 | | |
| Sometimes | 12 2.98 | 34 3.06 | | |
| Never | 5 1.24 | 3 0.27 | | |
| Q2/How much are you committed to the social distancing measure of maintaining a safe distance from other people? | | | | |
| Always | 210 52.11 | 771 69.33 | 48.877 | <0.001* |
| Often | 148 36.72 | 220 19.78 | | |
| Sometimes | 33 8.19 | 83 7.46 | | |
| Never | 12 2.98 | 38 3.42 | | |
| Q3/How much are you committed to the social distancing measure of no physical contact (like handshaking, hugging)? | | | | |
| Always | 315 78.16 | 772 69.42 | 15.345 | 0.002* |
| Often | 61 15.14 | 207 18.62 | | |
| Sometimes | 22 5.46 | 84 7.55 | | |
| Never | 5 1.24 | 49 4.41 | | |
| Q4/How much are you committed to the social distancing measure of not having meals with others? | | | | |
| Always | 331 82.13 | 965 86.78 | 5.170 | 0.160 |
| Often | 41 10.17 | 84 7.55 | | |
| Sometimes | 17 4.22 | 35 3.15 | | |
| Never | 14 3.47 | 28 2.52 | | |
| Q5/How much are you committed to the social distancing measure of staying at home during partial lockdown? | | | | |
| Always | 299 74.19 | 964 86.69 | 48.877 | <0.001* |
| Often | 77 19.11 | 130 11.69 | | |
| Sometimes | 18 4.47 | 15 1.35 | | |
| Never | 9 2.23 | 3 0.27 | | |

*Significant at level 0.05
Table 4 Age group-based comparison of answers (N = 1515)

| Answer | 18 and younger (n = 1287) | 19–40 (n = 198) | 41–65 (n = 28) | Older than 65 (n = 2) | Chi-square | P-value |
|--------|--------------------------|----------------|----------------|----------------------|------------|---------|
| Q1/How much are you committed to the social distancing measure of not attending gatherings out of home? | | | | | | |
| Always | 942 | 73.19 | 157 | 79.29 | 26 | 92.86 | 2 | 100.00 | 16.461 | 0.058 |
| Often | 298 | 23.15 | 35 | 17.68 | 1 | 3.57 | 0 | 0.00 | | |
| Sometimes | 40 | 3.11 | 6 | 3.03 | 0 | 0.00 | 0 | 0.00 | | |
| Never | 7 | 0.54 | 0 | 0.00 | 1 | 3.57 | 0 | 0.00 | | |
| Q2/How much are you committed to the social distancing measure of maintaining a safe distance from other people? | | | | | | |
| Always | 833 | 64.72 | 125 | 63.13 | 21 | 75.00 | 2 | 100.00 | 6.273 | 0.712 |
| Often | 313 | 24.32 | 51 | 25.76 | 4 | 14.29 | 0 | 0.00 | | |
| Sometimes | 95 | 7.38 | 19 | 9.60 | 2 | 7.14 | 0 | 0.00 | | |
| Never | 46 | 3.57 | 3 | 1.52 | 1 | 3.57 | 0 | 0.00 | | |
| Q3/How much are you committed to the social distancing measure of no physical contact (like hand shaking, hugging)? | | | | | | |
| Always | 910 | 70.71 | 157 | 79.29 | 19 | 67.86 | 1 | 50.00 | 10.838 | 0.287 |
| Often | 239 | 18.57 | 22 | 11.11 | 6 | 21.43 | 1 | 50.00 | | |
| Sometimes | 90 | 6.99 | 13 | 6.57 | 3 | 10.71 | 0 | 0.00 | | |
| Never | 48 | 3.73 | 6 | 3.03 | 0 | 0.00 | 0 | 0.00 | | |
| Q4/How much are you committed to the social distancing measure of not having meals with others? | | | | | | |
| Always | 1089 | 84.62 | 179 | 90.40 | 26 | 92.86 | 2 | 100.00 | 9.097 | 0.428 |
| Often | 111 | 8.62 | 14 | 7.07 | 0 | 0.00 | 0 | 0.00 | | |
| Sometimes | 48 | 3.73 | 3 | 1.52 | 1 | 3.57 | 0 | 0.00 | | |
| Never | 39 | 3.03 | 2 | 1.01 | 1 | 3.57 | 0 | 0.00 | | |
| Q5/How much are you committed to the social distancing measure of staying at home during partial lockdown? | | | | | | |
| Always | 1072 | 83.29 | 164 | 82.83 | 26 | 92.86 | 1 | 50.00 | 6.414 | 0.698 |
| Often | 175 | 13.60 | 29 | 14.65 | 2 | 7.14 | 1 | 50.00 | | |
| Sometimes | 28 | 2.18 | 5 | 2.53 | 0 | 0.00 | 0 | 0.00 | | |
| Never | 12 | 0.93 | 0 | 0.00 | 0 | 0.00 | 0 | 0.00 | | |

*Significant at level 0.05

Conclusion

In general, participants in our study demonstrated excellent adherence to all social distancing measures, which is essential to limit the spread and progression of COVID-19. However, attitudes regarding physical contact was low in the Makkah region, which necessitates greater effort in educating and warning people about the risks.
Table 5  Education level comparison of answers (N = 1515)

| Answer | High school (n = 243) | Bachelor’s (n = 1090) | Masters (n = 151) | Ph.D (n = 31) | Chi-square | P-value |
|--------|-----------------------|-----------------------|-------------------|--------------|------------|---------|
|        | n   %                 | n   %                 | n   %             | n   %        |            |         |
| Q1/How much are you committed to the social distancing measure of not attending gatherings out of home? | | | | | | |
| Always | 203 83.54             | 803 73.67            | 98 64.90          | 23 74.19     | 25.713     | 0.002*  |
| Often  | 31 12.76              | 253 23.21            | 42 27.81          | 8 25.81      |            |         |
| Sometimes | 7 2.88               | 30 2.75             | 9 5.96            | 0 0.00       |            |         |
| Never  | 2 0.82                | 4 0.37               | 2 1.32            | 0 0.00       |            |         |
| Q2/How much are you committed to the social distancing measure of maintaining a safe distance from other people? | | | | | | |
| Always | 161 66.26             | 710 65.14           | 86 56.95          | 24 77.42     | 7.869      | 0.547   |
| Often  | 56 23.05              | 261 23.94           | 45 29.80          | 6 19.35      |            |         |
| Sometimes | 19 7.82             | 81 7.43           | 15 9.93           | 1 3.23       |            |         |
| Never  | 7 2.88                | 38 3.49             | 5 3.31            | 0 0.00       |            |         |
| Q3/How much are you committed to the social distancing measure of no physical contact (like hand shaking, hugging)? | | | | | | |
| Always | 193 79.42             | 759 69.63           | 108 71.52         | 27 87.10     | 15.177     | 0.086   |
| Often  | 32 13.17              | 203 18.62           | 29 19.21          | 4 12.90      |            |         |
| Sometimes | 11 4.53             | 85 7.80           | 10 6.62           | 0 0.00       |            |         |
| Never  | 7 2.88                | 43 3.94             | 4 2.65            | 0 0.00       |            |         |
| Q4/How much are you committed to the social distancing measure of not having meals with others? | | | | | | |
| Always | 218 89.71             | 931 85.41           | 119 78.81         | 28 90.32     | 18.001     | 0.035*  |
| Often  | 14 5.76               | 85 7.80             | 24 15.89          | 2 6.45       |            |         |
| Sometimes | 6 2.47             | 42 3.85           | 3 1.99            | 1 3.23       |            |         |
| Never  | 5 2.06                | 32 2.94             | 5 3.31            | 0 0.00       |            |         |
| Q5/How much are you committed to the social distancing measure of staying at home during partial lockdown? | | | | | | |
| Always | 217 89.30             | 909 83.39           | 117 77.48         | 20 64.52     | 23.532     | 0.005*  |
| Often  | 20 8.23               | 150 13.76           | 28 18.54          | 9 29.03      |            |         |
| Sometimes | 6 2.47             | 23 2.11           | 3 1.99            | 1 3.23       |            |         |
| Never  | 0 0.00                | 8 0.73              | 3 1.99            | 1 3.23       |            |         |

*Significant at level 0.05
Table 6  City-based comparison of answers (N = 1515)

| Answer | Riyadh (n = 632) | Jeddah (n = 157) | Makkah (n = 249) | Madinah (n = 43) | Other (n = 434) | P-value |
|---------|------------------|------------------|------------------|------------------|----------------|---------|
| n       | %                | n                | %                | n                | %              | Chi-square |
| Q1/How much are you committed to the social distancing measure of not attending gatherings out of home? | | | | | | |
| Always  | 473 74.84        | 120 76.43        | 193 77.51        | 33 76.74         | 308.00 70.97   | 17.263   0.140 |
| Often   | 134 21.20        | 35 22.29         | 52 20.88         | 9 20.93          | 104.00 23.96   |          |
| Sometimes | 24 3.80         | 2 1.27           | 3 1.20           | 1 2.33           | 16 3.69        |          |
| Never   | 1 0.16           | 0 0.00           | 1 0.40           | 0 0.00           | 6 1.38         |          |
| Q2/How much are you committed to the social distancing measure of maintaining a safe distance from other people? | | | | | | |
| Always  | 399 63.13        | 108 68.79        | 159 63.86        | 29 67.44         | 286.00 65.90   | 25.072   0.014* |
| Often   | 150 23.73        | 44 28.03         | 72 28.92         | 10 23.26         | 92.00 21.20    |          |
| Sometimes | 58 9.18         | 3 1.91           | 16 6.43          | 2 4.65           | 37 8.53        |          |
| Never   | 25 3.96          | 2 1.27           | 2 0.80           | 2 4.65           | 19 4.38        |          |
| Q3/How much are you committed to the social distancing measure of no physical contact (like hand shaking, hugging)? | | | | | | |
| Always  | 434 68.67        | 121 77.07        | 121 48.59        | 29 67.44         | 299.00 68.89   | 36.999   <0.001* |
| Often   | 120 18.99        | 31 19.75         | 31 12.45         | 7 16.28          | 79.00 18.20    |          |
| Sometimes | 49 7.75         | 3 1.91           | 3 1.20           | 6 13.95          | 34 7.83        |          |
| Never   | 29 4.59          | 2 1.27           | 2 0.80           | 1 2.33           | 22 5.07        |          |
| Q4/How much are you committed to the social distancing measure of not having meals with others? | | | | | | |
| Always  | 544 86.08        | 138 87.90        | 215 86.35        | 35 81.40         | 364.00 83.87   | 15.402   0.220 |
| Often   | 55 8.70          | 10 6.37          | 23 9.24          | 5 11.63          | 32.00 7.37     |          |
| Sometimes | 16 2.53         | 7 4.46           | 9 3.61           | 2 4.65           | 18 4.15        |          |
| Never   | 17 2.69          | 2 1.27           | 2 0.80           | 1 2.33           | 20 4.61        |          |
| Q5/How much are you committed to the social distancing measure of staying at home during partial lockdown? | | | | | | |
| Always  | 539 85.28        | 126 80.25        | 216 86.75        | 35 81.40         | 347.00 79.95   | 21.120   0.049* |
| Often   | 77 12.18         | 27 17.20         | 30 12.05         | 6 13.95          | 67.00 15.44    |          |
| Sometimes | 14 2.22         | 3 1.91           | 3 1.20           | 2 4.65           | 11 2.53        |          |
| Never   | 2 0.32           | 1 0.64           | 0 0.00           | 0 0.00           | 9 2.07         |          |

*Significant at level 0.05
Compliance with Ethical Standards

Conflict of interest The authors declare that they have no known competing financial interests or personal relationships that could influence the work reported in this paper.

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