ORIGINAL ARTICLE

WILL PHYSICAL DISTANCING BE THE NEW PERCEIVED WAY OF LIFE IN THE POST-COVID-19 PANDEMIC ERA?

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ABSTRACT

Objective: The current study was conducted to determine whether people will keep practicing physical distancing behavior as part of their daily lives after the end of the COVID-19 pandemic.

Materials and Methods: A structured questionnaire was prepared online using "Question Pro" software for surveys, and the study was conducted electronically. The questionnaire for the study had two components, the first was related to the participant's demographics, and the other was about physical distancing questions. There were 16 questions in total.

Results: Women were more fearful/careful and would want to limit socializing than men. The religious aspect is one primary reason people will be willing to avoid physical distancing. Physical distancing was more acceptable to people with higher education levels. This physical distancing trend might affect the public transportation and tourism industry.

Conclusion: This study showed that the female gender and population with higher education are willing to follow better adherence to SOPs of the COVID-19 pandemic.

Keywords: Post-pandemic, physical distancing, lifestyle, behaviour, Pakistan

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INTRODUCTION

A Pandemic is a large-scale outbreak of infectious disease or natural disaster that spreads over a large geographical area, causing significant morbidity and mortality. The likelihood of pandemics has increased over the last century because of increased global travel, urbanization, and greater environmental exploitation[1]. Pandemics have multifaceted consequences, affecting global health, socioeconomic conditions, and political implications[2]. In the early 19th century, one-third of the world population was affected by Spanish influenza, and approximately 50 million people died due to it. A direct comparison of the current pandemic due to the Coronavirus Disease of 2019 (COVID-19) can be made to the pandemic of the previous century, Spanish influenza[3,4]. Novel Coronaviruses (n-CoV) belongs to the same family of coronaviruses that includes the Middle East Respiratory Syndrome Virus (MERS-CoV) and Severe Acute Respiratory Syndrome coronavirus (SARS-CoV)[5]. The viruses for both pandemics are pretty different. The combined effects during both pandemics are significantly similar[3,4].

Epidemiological and virologic studies reported that the primary source of transmission of COVID-19 could be transmitted through respiratory droplets, direct contact with infected people, or contact with contaminated surfaces and objects[6-10]. Pre-symptomatic transmission is the second kind of transmission in which a virus is transmitted before having any symptoms to another person[11,12]. Globally, measures to prevent the spread of COVID-19 include increasing handwashing, reducing face touching, wearing masks in public, and physical distance[13]. Countries take various measures to practice physical distancing. These measures include avoiding handshakes or physical con-

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tact, avoiding social gatherings or visiting family or friends, wearing masks and gloves, closing public and tourist places, etc[14]. Furthermore, governmental authorities ensured the availability of necessary medical supplies for health care practitioners, the general population, and patients by imposing restrictions on exporting those goods or items[15]. Hence, the government of Pakistan took steps to cut the spread of this virus. Apart from imposing physical distancing, actions were taken to stop mass gatherings by closing schools, colleges, universities, malls, and marriage halls during the pandemic[16]. Furthermore, political and non-political gatherings were also called off[17]. To the authors' best knowledge, minimal literature is available on the topic which assessed the physical distancing behavior in the post-pandemic era. However, one study published in Saudi Arabia evaluated the same idea and reported that people were keen to follow some physical distancing behaviors[18]. In addition, the study also reported that males showed less agreement to stop complying with physical distancing measures than females, even after the ease of the restrictions[18].

The current study population comprised Pakistanis, and Pakistani society can be classified as a "high-context culture" [19]. People rely heavily on nonverbal communication, such as shaking hands and hugging, as a greeting or welcome and as a sign of respect[20]. In addition, the majority of the population is Muslim, where praying five times at the Mosque is obligatory; therefore, people may avoid going outside for a walk or just moving around, but they cannot stop themselves to not go for obligatory prayers at mosque[21]. Keeping homo-sapiens socially apart is against human nature[22]. However, regular repetition of behavior results in a habitual or programmed way of life[23]. Furthermore, due to the secondary reinforcement gained, people are becoming accustomed to limited socialization and taking preventive measures. Hence, the current study's purpose was to determine whether people will keep practicing physical distancing behavior as part of their daily lives after the end of the COVID-19 pandemic or if they will return to the old ways of life.

MATERIALS AND METHODS

This cross-sectional study was conducted in Karachi, Pakistan. The period of the study was from October to December 2020. Ethical approval was obtained from the Institutional Review Board (IRB) of Jinnah Sindh Medical University (JSMU) (Ref. #: JSMU/IRB/2020/-361). Inclusion criteria were: (1) Males and females aged 18-80 years residing in Karachi, Pakistan. Exclusion criteria were: (1) those who could not read Urdu or English, (2) people who were unwilling to participate or did not provide consent. Formal ethical approval was obtained from the Institutional Review Board (IRB) of Jinnah Sindh Medical University (Ref. #: JSMU/IRB/2020/-361), per the Declaration of Helsinki.

Rao soft software was used to calculate the study sample size. With a response distribution of 50%, a margin of error of 3%, and a 95% confidence level, the required sample size for the study was calculated to be 1066. Lower than the customary margin of error of 5% was taken to increase the study's strength.

The questionnaire for the study had two components, the first was related to the participant's demographics, and the other was about physical distancing questions. Questions related to physical distancing were derived from the preventive measures provided by WHO/CDC guidelines. The questionnaire was designed in English and was translated into Urdu, and the translation person of JSMU did reverse translation to validate the translation procedure. Following the development of the questionnaire, the validity of the questionnaire was determined by conducting a pilot study. This pilot study was conducted in Karachi, and 40 responses were collected. Results from the Kappa statistic (0.79) provided acceptable results; hence no change in the questionnaire was required.

A structured questionnaire was prepared online by using "QuestionPro" software for surveys. The study was conducted electronically. There were 16 questions in total. A cover page and a summary of the study's purpose and consent were attached to the questionnaire. The participant had the option to click on "I Agree' or 'I Disagree" at the end of the consent on the cover page. The questionnaire will not proceed to the next section if the participant clicks on the "I Disagree" button. Response options for each question related to physical distancing behavior were recorded on Likert Scale (1. Never, 2. Seldom, 3. Sometimes, 4. Frequently, 5. Always). The survey link was sent to all the study's authors' WhatsApp contacts. The authors also asked their contacts to spread the link further. The submission of the completed anonymous survey implied consent.

Electronically collected data was initially entered into the Excel program and then transferred and coded in Statistical Package for Social Sciences (IBM SPSS V. 23, Chicago, USA) for analysis. Frequency distributions and bar diagrams were used for the descriptive presentation of the data. The Shapiro-Wilk test was used to look for the normality of data. Insignificant results from this test proved that the data were normally distributed. Hence, parametric tests were used for inferential data analysis. A comparison between participants' demographics with their responses to questions related to physical distancing was made by using the chi-square test. The level of significance was set as 0.05.

RESULTS

The survey link was sent to 1319 individuals, of which 910 completed and submitted the questionnaire. Hence the response rate was 69%. The mean age of the participants was 27.68 ± 8.734 (range: 18 – 80) years. The total number of female participants was 511(56%), out of

which 72 (8%) were housewives. Many study participants lived in houses with 4 to 6 adults; 407 (45%) and 1 or 2 children 357 (39%). Based on the level of education, 39 percent (349) participants belonged to undergraduate school, followed by graduate school students, 290 (33%), 225 (25%) postgraduate, and 23(3%) belonged to high school or lesser grades level. The majority of the population (based on professional status) who participated in the current study were students 411 (45%), followed by other professions 315 (35%) (e.g. accountant, pharmacist, private workers, IT professional, Banker, etc.). Doctors 50 (5%), Teachers 48 (5%), businessmen 47 (5%), and Engineers 38 (4%) constituted the remaining of the sample population. The overall percentages of agree, disagree, and neutral responses of participants are given in Figure 1. Disagreement was on the higher side in questions regarding going out for picnic/shopping, etc., using public transport, and attending public gatherings (100%, 60%, and 43%, respectively). On the contrary, the highest percentage of agreement was recorded for attending congregational prayer in Masjid/Church/Temple (56%), followed by hanging out with family/friends or relatives (50%). Hosting a gathering at home and shaking hands with family and friends had 44% agreement, respectively. Table 1 (A & B) and Table 2 (A & B) show the comparisons of the demographical characteristics of participants with their perceptions about the post-COVID lifestyle concerning friends/family interactions and outdoor activities, respectively. Overall, a significantly high proportion of males showed their agreement as compared to women about attending religious practice outside (64% vs 49%, $p < 0.0001$), handshaking with friends/colleagues (51% vs 40%, $p= 0.001$), greeting friends by hugging them (41% vs 30%, $p= 0.003$), hanging out with family/friends (57% vs 44%, $p= 0.001$) and attending a gathering of families and relatives (40% vs 32%, $p= 0.04$). Female participants' disagreement was significantly higher regarding traveling in public transport (65% vs 54%, $p =0.003$) than men.

Participants' level of education was found to be significantly associated with their perception regarding attending gatherings of family/friends or other relatives ($p= 0.001$). Level of education was also significantly associated with the usage of public transportation, fear of attending public gatherings and attending regular appointments (p – values of 0.017, 0.043 & 0.011, respectively). It was found that an increase in education reduced the fear of attending public gatherings ($p= 0.017$). Participants living with nine or more adults were significantly more likely (60%) to shake hands than those living with fewer adults in their houses ($p =0.047$). Disagreement level was found to be significantly high among the families, irrespective of the number of adults and children in the family regarding public transport (p-value = 0.023, 0.014 respectively). Almost 100% of participants disagreed with going out for entertainment (picnic, shopping mall, sports etc.).

Table 1A: Participants' demographics' association with self-perception

		I would feel normal/safe shaking hands with my family, friends, and colleagues			I would feel normal/safe greeting my family, friends, and colleagues by giving a hug			I would feel normal/safe hanging out with fami-ly/friends		
		Disagree	Neutral	Agree	Disagree	Neutral	Agree	Disagree	Neutral	Agree
		Disagree	Neutral	Agree	Disagree	Neutral	Agree	Disagree	Neutral	Agree
Gender	Male	81(20)	116(29)	202(51)	104(26)	132(33)	163(41)	71(18)	100(25)	228(57)
	Female	108(21)	201(39)	202(40)**	184(36)	172(34)	155(30)**	93(18)	192(38)	225(44)**
Education	Postgraduate	59(26)	77(34)	89(40)	80(36)	74(33)	71(32)	46(20)	71(32)	108(48)
	Graduate	64(22)	104(36)	122(42)	90(31)	110(38)	90(31)	53(18)	102(35)	134(46)
	Undergraduate	62(18)	123(35)	164(47)	106(30)	107(31)	136(39)	60(78)	107(31)	182(52)
	High school or less	3(13)	6(26)	14(61)	5(22)	6(26)	12(52)	3(13)	8(35)	12(52)
Number of Adults	1-3	74(24)	121(39)	118(38)	106(34)	103(33)	104(33)	65(21)	97(31)	150(48)
	4-6	76(19)	134(33)	197(48)	115(28)	148(36)	144(35)	62(15)	134(33)	211(52)
	7-9	26(23)	37(33)	50(44)	44(39)	30(27)	39(34)	21(19)	41(36)	51(45)
	9+	6(14)	11(26)	25(60)*	13(31)	11(26)	18(43)	8(19)	9(21)	25(60)
Number of Children	1-2	73(20)	139(39)	145(41)	119(33)	120(34)	118(33)	76(21)	112(31)	169(47)
	3-4	36(25)	42(29)	66(46)	53(37)	47(33)	44(31)	26(18)	47(33)	70(49)
	5-6	13(23)	14(25)	29(52)	18(32)	12(21)	26(46)	9(16)	17(.30)	30(54)
	6+	6(21)	9(31)	14(48)	7(24)	10(34)	12(41)	6(20)	9(31)	14(48)

* statistically significant at 0.05 level of significance

** statistically significant at 0.01 level of significance

Table 1B: Participants' demographics' association with self-perception

		I would feel normal/safe to attend gatherings of family/friends/ other rela-tives			I would feel safe hosting a friend/family gathering at my home		
		Disagree	Neutral	Agree	Disagree	Neutral	Agree
Gender	Male	117(29)	122(31)	160(40)	98(25)	129(32)	172(43)
	Female	164(32)	183(36)	164(32)*	124(24)	154(30)	233(46)
Education	Postgraduate	88(39)	67(30)	70(31)	70(31)	61(27)	94(42)
	Graduate	89(31)	110(38)	91(31)	65(22)	100(34)	125(43)
	Undergraduate	97(28)	111(32)	141(40)	79(23)	110(32)	160(46)
	High school or less	2(9)	7(30)	14(61)**	3(13)	7(30)	13(57)
Number of Adults	1-3	112(36)	101(32)	100(32)	86(27)	104(33)	123(39)
	4-6	121(30)	128(31)	158(39)	97(24)	116(29)	194(48)
	7-9	30(27)	43(38)	40(35)	22(19)	39(34)	52(64)
	9+	11(26)	17(40)	14(33)	10(24)	11(26)	21(50)
Number of Children	1-2	126(36)	114(32)	117(33)	92(26)	112(31)	153(43)
	3-4	44(31)	52(36)	48(33)	33(23)	53(36)	58(40)
	5-6	14(25)	14(25)	28(50)	12(21)	10(18)	34(60)
	6+	8(26)	11(38)	10(34)	6(21)	10(34)	13(45)

* statistically significant at 0.05 level of significance

** statistically significant at 0.01 level of significance

Table 2A: Participants' demographics' association with their perception of social activities

		I would feel normal/safe using public transportation with strangers around			I would be fearful of attending a public gathering like welcoming house parties			I would feel normal/safe to tend at my regular appointments at hospital/healthcare centres		
		Disagree	Neutral	Agree	Disagree	Neutral	Agree	Disagree	Neutral	Agree
Gender	Male	218(54)	96(24)	85(21)	100(25)	113(28)	186(46)	131(33)	129(32)	139(35)
	Female	332(65)	105(20)	73(15)**	151(30)	153(30)	207(40)	179(35)	173(34)	159(31)
Education	Postgraduate	140(63)	48(21)	36(16)	66(29)	50(22)	109(48)	83(37)	66(29)	76(34)
	Graduate	197(68)	56(19)	37(13)	79(27)	97(33)	114(39)	105(36)	108(37)	77(27)
	Undergraduate	189(54)	84(24)	76(22)	95(27)	106(30)	148(42)	110(32)	119(34)	120(34)
	High school or less	12(52)	7(30)	4(17)*	2(9)	10(43)	11(48)*	6(26)	3(13)	14(61)*
Number of Adults	1-3	197(63)	67(21)	49(16)	75(24)	88(28)	150(48)	112(36)	98(31)	103(33)
	4-6	235(58)	99(24)	72(18)	113(28)	117(29)	177(43)	133(33)	144(35)	130(32)
	7-9	79(70)	17(15)	17(15)	38(34)	30(27)	45(40)	42(37)	34(30)	37(33)
	9+	22(52)	6(14)	14(33)*	13(31)	17(40)	12(29)	13(31)	11(26)	18(43)
Number of Chil-dren	1-2	227(64)	76(21)	53(15)	95(27)	99(27)	163(46)	119(33)	129(36)	109(31)
	3-4	94(65)	30(21)	20(14)	40(28)	38(26)	66(46)	51(35)	40(28)	53(37)
	5-6	25(45)	12(21)	19(34)	24(43)	9(16)	23(41)	16(29)	19(34)	21(38)
	6+	18(62)	8(28)	3(10)*	7(24)	12(41)	10(34)	10(35)	13(45)	6(21)

* statistically significant at 0.05 level of significance

** statistically significant at 0.01 level of significance

DISCUSSION

Since the outbreak of the COVID-19 pandemic, lifestyles across the globe have been changed in many ways, including a change in working style, visiting public places, interaction with others, etc[24]. Literature has documented the impact on physical and mental health due to lifestyle medication from this pandemic[25,26]. However, literature is scarce regarding the information on post-pandemic perceived lifestyle. Hence, this study was designed to evaluate the perceived post-pandemic lifestyle among the people living in Pakistan.

In the pre-designed questionnaire for this study,

Table 2B: Participants' demographics' association with their perception of social activities

		I would feel normal/safe to attend my congrega-tional prayer in Masjid/Church/Temple			I would prefer to entertain myself by going to picnic spots/ shopping malls/din-ing out
		Disagree	Neutral	Agree	Disagree
Gender	Male	75(18)	68(17)	256(64)	399(44)
	Female	148(29)	111(22)	251(49)**	511(56)
Education	Postgraduate	65(29)	44(20)	115(51)	225(25)
	Graduate	65(22)	60(21)	165(57)	290(33)
	Undergraduate	85(24)	73(21)	191(55)	349(39)
	High school or less	5(22)	2(9)	16(70)	23(3)
Number of Adults	1-3	95(30)	67(21)	151(48)	313(36)
	4-6	93(23)	74(18)	239(59)	407(47)
	7-9	21(19)	24(21)	68(60)	113(13)
	9+	5(12)	6(14)	31(74)**	42(5)
Number of Chil-dren	1-2	96(27)	69(19)	191(54)	357(61)
	3-4	31(22)	31(22)	82(57)	144(25)
	5-6	9(16)	6(11)	41(73)	56(10)
	6+	2(7)	5(17)	22(76)*	29(5)

* statistically significant at 0.05 level of significance

** statistically significant at 0.01 level of significance

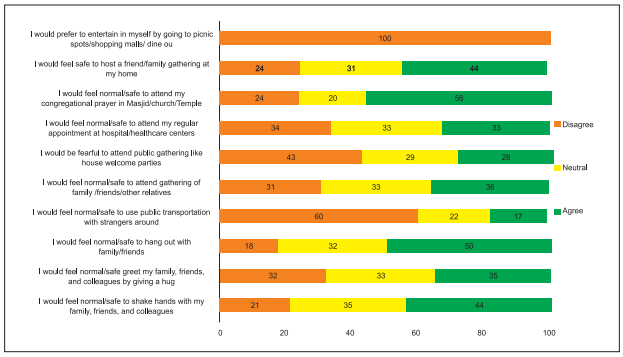

Fig 1: Overall Percentage of Participants' Behavior about the Post COVID-19 Life

recommended physical distancing measures were taken as questions and categorized into two components, (1) physical contact with others (handshake, hugging, etc.) and (2) using or visiting publicly shared places.

In general, many participants disagreed with visiting public places (shopping malls, picnic spots, or dining out) and using public transport. Conversely, most men agreed to attend congregational prayers at Masjid/ Church/temple and hang out with family/friends. Only 17% of the study population agreed to use public transport even after the pandemic. The results showed the same behaviour as hypothesized: people might avoid going outside, meeting with others, and using and visiting public places or transport, but due to the religious factor, they might not stop performing congregational prayers together. A similar study was conducted in Dammam, Saudi Arabia, in which over a thousand responses were collected from people with different educational levels and family sizes. The study's findings were similar to the current study in which participants were hesitant to visit public places and use public transport; however, when performing congregational prayers, males had higher agreement levels than females[18]. This cautious behaviour will have severe implications for the transportation industry, as a large proportion of Pakistan's working class depends on public transportation[27]. Studies suggested a framework for disaster management and agenda for post-pandemic management of the hotel industry and economic crisis management in general that can be followed in Pakistan as a precautionary method[28,29]. Another notable finding of the study highlights that one-third of the respondents were not sure about practicing physical distancing. Hence, it can be assumed that if they decide to continue or stop physical distancing behavior later in time, it will have a grave (positive/negative) impact on the tourism, entertainment, and transport industries. Khan et al. from Saudi Arabia found that about 30% of the participants disagreed with stopping physical distancing behavior[18]. Another noticeable finding of the present study was that 30 to 35% of the study participants responded with a neutral response to many questions (Figure 1). However, people cannot remain neutral after the ease of COVID restrictions.

Men were generally found less fearful than women when asked about physical distancing, as men mostly favored stopping physical distancing post-pandemic. In response to almost every question, the proportion of females was lesser than males who showed their agreement towards stopping practicing physical distancing. In some questions, it was significantly less. Contradictory to this, a study from Saudi Arabia reported that females were less

fearful, agreed more than males to stop physical distancing behavior, and found keener to start socialization[18]. Furthermore, study findings suggested that education had a significant association with physical distancing behavior. Participants at the lower level of education were keener to stop physical distancing behavior than participants with higher education. People who were more educated agreed less in favor of stopping practicing physical distancing. This observation showed that people with higher education levels might have more information and knowledge about the virus, and perhaps they are also aware that this virus cannot go to be subsided. Therefore, the fear of getting infected would remain longer among those who were more educated. Similar findings were reported by Khan et al. in a study published in Saudi Arabia[18].

As Pakistan is a Muslim-majority country and among Muslims, praying five times a day in Masjid is a religious obligation. Shaking hands when meeting others is also a religious and robust social aspect of society[30]. Hence, it was observed that a large group of participants showed agreement to attend to their religious obligations. As established since the start of the COVID-19 pandemic that vaccine will be required to boost immunity against the disease. Especially those with underline conditions or older adults so that the weak immune system, either because of other diseases or age, can respond more effectively in case of getting infected with a virus[31]. COVID-19 vaccine does not guarantee re-infection with the virus, but data has shown that it decreases the number of patients with severe COVID infections and the number of deaths[32]. Therefore, fear of getting an infection will exist even with getting vaccinated[33]. However, when this study was conducted, COVID-19 vaccination was not started at a detectable level in Pakistan; therefore, the impact of the vaccine could not be assessed with the post-pandemic physical distancing behaviour.

Although the study had a sufficiently large data size, there were also some limitations. Because data were collected by sending the survey link to personal contacts, all segments of society would not be covered. In addition, the participants' religion could be an essential factor causing variation in the responses. The present study only included only one geographical region. Inclusion and comparison between the regions perhaps contribute as a significant factor. Another study limitation was the occupation of the participants was collected as an open-ended question that caused problems in analysis. It is suggested for future studies to make a close-ended question for the participants' occupation to facilitate and serve the analysis purpose. The current study did not include a history of COVID infection; those who got infected with the virus could have a different perception than others. Finally, the data collection process was completed before the start of the vaccination campaign in Pakistan. After getting vaccinated, people may feel safer and respond differently.

CONCLUSIONS

Study participants disagreed with stopping practicing some of the physical distancing measures. Based on that, it is clear that people might carry the physical distancing behavior post-pandemically. Studies showed that females and the higher education population are willing to follow better adherence to SOPs of the COVID-19 pandemic. Hence, due to the high proportion of the participants, who disagreed with stopping physical distancing even after the ease of the restrictions, there would be severe effects on some industries like; transportation, tourism, traveling, hotel, etc. Therefore, this study portrayed the possible future public behavior which must be considered to retain the businesses by either making contingency plans or reducing the fear of the virus. Public awareness campaigns perhaps play a positive role in this regard. Future research should be conducted to assess the change in perception regarding post-pandemic physical distancing behavior after vaccination. Furthermore, if the perceived lifestyle persists for an extended period, it will have an impact on social life and a significant impact on culture and society.

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AUTHOR'S CONTRIBUTION

Following authors have made substantial contributions to the manuscript as under

Khan SQ:	Conception and overall supervision of research
Moheet IA:	Data collection
Farooqi FA:	Manuscript writing
Khan N:	Manuscript writing
Wahab S:	Data collection
Haider I:	Critical review/Statistical analysis
Al-Shayea N:	Bibliography, literature search
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Authors 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.