

## **Fear of Covid-19 and Compliance with Preventive Behaviours: Gender Differences among Youth in India**

Shruti Jhamb<sup>1\*</sup>, Devashri Bhargava<sup>1</sup>, Megha Dhillon<sup>2</sup>

<sup>1</sup>Department of Psychology, Lady Shri Ram College for Women, University of Delhi

<sup>2</sup>Ph.D., Assistant Professor, Department of Psychology, Lady Shri Ram College for Women, University of Delhi

### **Abstract**

*The Covid-19 pandemic has emerged as a gendered phenomenon in several ways, with women reporting greater risk aversion, perceived chances of infection and fear of family members getting sick compared to men. The present study aimed to investigate gender differences in fear of Covid-19 and compliance to preventive behaviour during the pandemic among young adults in the metropolitan cities of India. Although India has been one of the countries hardest hit by the pandemic, this remains an under-investigated area here. Data was collected from 159 participants (79 men and 80 women) on two variables: fear, measured by the Fear of Covid-19 Scale, and compliance, measured by the Preventive Behaviours Questionnaire. The results indicated no gender differences for both variables, thereby, rejecting the hypothesis of the study that women will be more fearful and compliant than men. Further, a content analysis designed to identify the reasons for low compliance among participants who reported the least levels of adherence to preventive Behaviours found the main factors to be high rates of vaccination and the presence of Covid fatigue. The lack of gender differences found in the study necessitates further research but may potentially be partly attributed to the severity of the pandemic in the country, supplemented by similar levels of exposure to information about the pandemic among men and women. The lack of gender differences in fear may explain the lack of differences found for compliance. Implications and strategies for tackling factors driving low compliance to preventive Behaviours are discussed.*

**Keywords:** *Fear of Covid, Gender differences, Health, Preventive behaviours.*

### **Introduction**

The first case of Covid-19, a novel disease caused by the SARS-COV-2 coronavirus, was reported in Wuhan, China, in December 2019. Soon after, the virus spread globally and was declared a public health emergency of international concern by the World Health Organisation in January 2020. It was eventually discovered that the disease had a spectrum of symptoms, ranging from mild to severe with about 1 in 6 persons becoming seriously ill [1]. Within the first three months of the outbreak of Covid-19 infections, a third of the global population faced lockdowns [2]. The Indian

Government enforced a stringent 55-day country-wide lockdown in March 2020 to control the transmission of the virus. Despite this, India's Covid-19 tally crossed the 600,000 marks over the next six months. Eventually, the numbers fell, and India began its somewhat delayed and slow-paced vaccination programme in January 2021.

The second wave of the novel coronavirus began shortly after and was significantly more treacherous than the first. The sudden re-surge in cases was traced to the emergence of a new variant of the virus (eventually named Delta by the WHO) and the government's nod to

**Received: 06.06.2022**

**Accepted: 05.08.2022**

**Published on: 30.11.2022**

**\*Correspondence Author: shrutiijhamb@gmail.com**

conducting prolonged mass gatherings such as the Kumbh Mela [3]. As the cases piled up, the country faced acute shortages of vaccinations, availability of doctors, hospital beds, oxygen cylinders, and other medications [4]. Understandably, the intensity of the outbreak and the mammoth loss of life it entailed generated wide-spread fear and anxiety.

Ever since the beginning of the pandemic, the Indian Government has conducted broad-based radio, television, and social media campaigns to create awareness about the pandemic. The government has time and time again necessitated the implementation of preventive measures such as washing hands frequently, using alcohol-based hand sanitizers, wearing face masks, and following social distancing measures in public places.

WHO representatives have averred that abiding by these rules and regulations is necessary to reduce the number of active cases across the globe. It has also been stressed that the effectiveness of the preventive measures and protocols essentially depends on people's inclination to adhere to those measures. The Central and State governments have taken specific measures to elicit compliance with preventive measures. For example, the Delhi State government imposed a fine of Rs. 2000 in 2020 for those who were found to be without masks in public places.

The Delhi Police has collected fines worth millions of rupees from the public for violation of safety norms [5]. The large sums of money collected through fines indicate high norm violation rates, despite a repeated governmental warning and people's own lived experiences of the devastation caused by the virus.

It is a well-known fact that many people engage in high-risk behaviours such as smoking and binge drinking while being aware of the negative outcomes these practices can entail. Why this occurs has been a question of intrigue for health practitioners but is clearly a demonstration of the much-discussed cognition-behavior gap studied closely by social

psychologists. Research on the issue has found such behaviour to be attributable to cognitive biases such as unrealistic optimism [6], fatalism [7], our abilities to suppress dissonance, and social factors such as peer pressure [8]. Within the context of the Covid-19 pandemic, research has found personality to be an important variable. Personality traits such as carelessness, impatience, risk-taking, frustration [9], low motivation, and lack of self-efficacy have been identified as contributing factors. According to the Health Belief Model [10], individuals are likely to comply with Covid-19 protocols if they perceive themselves to be susceptible to the virus, which they regard to be threatening, and believe that the benefits associated with engaging in protective behaviour outweigh the costs. The Theory of Planned Behaviour [11] predicts that compliance to preventive behaviour depends on attitudes towards the preventive behaviour (such as whether people think it is useful, important, or desirable); the social norms they perceive to be prevailing around them, and the control that individuals have over their actions [12].

Another variable that appears to impact adherence to health behaviours is gender. Research has found men to be less willing and lacking the motivation to engage with health-related information. Men also possess limited awareness about the sources of health-related information. Women are more active seekers of health-related information than men. An analysis of seven major US nationally representative data sets indicated that a strong and consistent predictor of frequent health information seeking was being female. [13]. Such gender differences have most often been traced to gender role constraints and social constructions of masculinity and femininity. Unsurprisingly the pandemic has emerged to be a gendered phenomenon in many ways. For example, women are more likely than men to perceive the Covid-19 pandemic as a serious health problem. Women exhibit greater risk aversion, confidence

in scientists, and perceived chances of infection [14].

A larger share of women harbour fears about someone in their family getting sick in comparison to men. Working mothers seek to avoid contagion due to the added fear of loss of income due to the virus [15]. All these factors contribute to women's increased compliance with Covid-19 protocols and support for restrictive measures [14]. For example, women are more inclined to take precautions as compared to men, even when it is not compulsory [16].

Since men are more likely to hide their fears [17] and downplay the severity and the potential of the virus to harm them, they are more likely to engage in high-risk behaviours and less likely to take precautionary measures. This is despite the fact that Covid-19 produces differences in morbidity and mortality between sexes, with male patients having almost three times the odds of requiring intensive treatment unit admission and higher odds of death [18]. While the prevalence of Covid-19 is comparable for men and women, men with Covid-19 are more at risk for worse outcomes and death, independent of age [19, 20].

The present study was conceived and executed after India had faced the destructive second wave of Covid-19. Despite the vast literature on gender differences in fear of the virus and compliance to preventive behaviour during Covid-19 from other parts of the world, little is known about the issue among young adults in India. The present study addresses this specific gap in the literature. Another objective of the study was to understand the reasons for low compliance among young men and women. It was hoped that such information could be used to develop more effective public health campaigns in the future. It was hypothesized in line with earlier studies, that women would demonstrate significantly higher fear of the Covid-19 virus and show more compliance with preventive behaviour than men.

## **Methodology**

### **Participants**

Two main inclusion criteria were employed to select the sample for the present study: the respondent must fall in the age group 18-30 years and must not have been infected with the virus in the last 4 months, i.e., from April 2021 to August 2021. The factor of being infected was controlled as it was believed that it would critically impact the variables being investigated in the study. Participants were recruited through the convenient sampling technique. Altogether, 178 respondents filled in the questionnaires provided by the researchers. However, 19 responses were eliminated as they did not meet the inclusion criteria.

The final sample comprised 159 participants (80 females and 79 males). The mean age of the female participants was 19.7 years, while the mean age of males was 20.3 years. Most of the participants in the study were students pursuing their undergraduate degree. The participants were from different parts of the country, with many coming from the Western state of Maharashtra (23%) and northern states of Haryana (22%), Delhi (19%), and Uttar Pradesh (10%).

### **Materials**

#### **Fear of Covid-19 Scale**

Fear of Covid-19 Scale [21] is a 7 item self-report measure used to measure an individual's level of fear of the virus. The items include statements such as "I cannot sleep because I'm worried about getting Corona". Responses were recorded on a five-point Likert scale ranging from strongly agree (5) to strongly disagree (1). Possible scores range from 7 - 35, where a higher score indicates a more severe fear of Covid-19. The scale has robust psychometric properties. It is reliable and valid in assessing fear of Covid-19 among the general population. The scale has good internal consistency ( $\alpha = .82$ ) and test-retest reliability ( $ICC = .72$ ).

The concurrent validity of FCV-19S has been supported by the Hospital Anxiety and Depression Scale and the Perceived Vulnerability to Disease Scale.

### The Preventive Behaviours Measure

The Preventive Behaviours questionnaire [22] containing 33 items, was used to measure the respondent's compliance in 4 domains: individual behaviour, guidelines for entering one's house, guidelines for leaving one's house, and preventive guidelines for using personal belongings. The items included statements such as "I cover my mouth and nose while sneezing or coughing". Responses were recorded on a five-point Likert scale, ranging from 'never' to 'always'. All responses were scored 0 except 'always', which was given a score of 1. Possible scores range from 0 - 33, where a higher score indicates more compliance with preventive behaviour. The validity and reliability of the questionnaire has been determined by the authors of the questionnaire. Eleven experts rated the items, and the content validity indices of the questionnaire were calculated to be 0.81. The Cronbach's alpha of the questionnaire was 0.82, indicating internal consistency.

### Reasons for Non-Compliance Form

This set of questions was designed by the authors to identify the probable reasons for low compliance among the Indian youth. It consisted of five questions - "Have you been vaccinated?", "Has anyone in your immediate family (parents, siblings, grandparents) been infected with the

virus?", "Which are some of the following activities you did during the pandemic?" and "Why did you engage in these activities?" and "What do you think are the consequences of not following protocols?".

### Procedure and Data Analysis

The period of data collection for the study was August 2021. Data was collected online due to the restrictions imposed in earlier months and took place in two stages. During the first stage, a Google form containing the informed consent form, the demographic information form and the two standardized instruments - Fear of Covid-19 Scale and Preventive Behaviours Questionnaire was mailed to the participants. Each questionnaire was scored by the researchers as per guidelines provided by the test constructors. Gender differences were analysed by comparing the scores of men and women through the t-test for independent samples. The second stage of data collection was carried out after one month. Another Google form containing the Reasons for non-compliance form was sent to 30 participants (15 men and 15 women), who were among the lowest scorers on compliance (scoring between 0 - 8 out of 33 on the Preventive Behaviours scale) in the first phase. The responses given by the participants during this stage were analyzed using the technique of content analysis.

### Result

Table 1 shows the independent sample t-test of means of fear and compliance between men and women.

**Table 1.** Independent Sample t-Test of Means of Fear and Compliance between Men and Women

Variable	Women		Men		t	p-value
	M	SD	M	SD		
Fear	17.24	4.69	17.05	6.56	0.20674*	0.418239
Compliance	12.06	5.31	11.38	6.28	0.74077*	0.22997

Scores on the fear variable were found to be very similar for men (M =17.05, SD =6.56) and women (M =17.24, SD =4.69). The statistical analysis found there to be no significant gender

differences (t =0.21, p =0.42). Further, there were no significant gender differences between men and women on the compliance variable (t =0.74, p=0.23) as revealed by the comparison of

scores obtained by women ( $M = 12.06$ ,  $SD = 5.31$ ) and men ( $M = 11.38$ ,  $SD = 6.28$ ). Thus, the hypotheses that women will be more fearful of the virus and will be more compliant to preventive behaviour were rejected. Finally, a quantitative content analysis was performed to

analyze the probable reasons for low compliance scores among the sample. However, this analysis did not focus on gender differences, as there were found to be none. Table 2 summarizes the results of the content analysis.

**Table 2.** Quantitative Content Analysis

<b>Category</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Have you been vaccinated?</b>		
Received First dose of vaccine	3	10%
Received Both doses of vaccine	26	86.67%
Not vaccinated	1	3.33%
<b>Has anyone in your immediate family (parents, sibling, grandparents) been infected with the virus?</b>		
Yes	14	46.67%
No	16	53.33%
<b>Which are some of the following activities you did during the pandemic?</b>		
Attended parties/functions	16	53.33%
Visited restaurants/cafes/eateries	17	56.67%
Travelled in public transport (metro, cab, auto etc.)	14	46.67%
Went for a holiday/getaway	11	36.67%
Stayed at home	5	16.67%
Played outdoor sports	2	6.67%
<b>Why did you engage in these activities:</b>		
You considered it necessary	6	20%
You are not scared of the virus	7	23.33%
You are tired of staying at home	17	56.67%
You are vaccinated	17	56.67%
You think you'll recover easily from Covid	3	10%
You think that public places have enough preventive measures (sanitiser, etc.) for Covid	4	13.33%
You think wearing a mask is enough to protect you from catching the virus	6	20%
Other	4	13.33%
<b>What do you think are the consequences of not following protocols?</b>		
Chances of contracting the virus	17	56.67%
Spreading the virus	17	56.67%
Extension of lockdown - increase in cases	6	20%
Financial strain	1	3.33%
Death	3	10%
No consequences	1	3.33%

From Table 2, it can be inferred that several participants had engaged in what may be considered high-risk Behaviours, such as visiting restaurants/cafes/eateries (56.67%) and attending parties/functions (53.33%). Cafes and restaurants are high-risk settings as most people are bound to take their masks off to eat and drink. Parties and functions also entail low chances of people masking themselves and usually involve a large number of people getting together and being in close proximity. The two most perceived risks of not following protocols emerged to be contracting the virus (56.67%), and spreading the virus (56.67%). While awareness of these risks was high, factors such as being tired of staying at home and being vaccinated (reported by 56.67% of respondents each) encouraged people to step out and take risks.

## **Discussion**

The present study found men and women to express a similar amount of fear of Covid-19. This is a surprising finding in the face of vast amounts of literature that indicate gender differences when it comes to Covid-19 related cognition and Behaviours. The reasons behind the lack of gender differences in this study warrant further investigation. Yet, there are a few probable reasons that may be discussed. The pandemic in India has been a pan-country phenomenon cutting across class, caste, and regional boundaries. According to a UN report released in 2022, India lost 240,000 lives during the Delta-related surge alone [23]. It may be said that no one spared witnessing the extreme devastation caused by the surge that caught the country unguarded and unprepared. Although men may generally appear to be more open to health-based risks in women, the sheer magnitude of the surge and its effects may have diminished gender differences. The lack of gender differences in fear, in turn, may then explain the lack of gender differences found for preventative Behaviours. A repeated cross-sectional survey of around 1,500 people in the

United States found that women reported greater fear of the pandemic compared to men. However, gender differences in preventative health Behaviours disappeared once the researchers controlled for emotional experiences, suggesting that fear of the pandemic, and not gender per se, drives behavioral differences [24]. Other reasons for the lack of gender differences may be related to the demographic of the sample. The participants belonged to urban regions and were well-educated. Both men and women were either enrolled in under-graduation/post-graduation courses or had finished their tertiary education and were employed. This increases the probability of men and women in the sample being exposed to a similar flow of information on the causes and outcomes of the virus resulting in comparable knowledge about the virus, infection, and treatment [25]. Further, it has been suggested that gender differences in risk perceptions related to health matters may stem from prevalent gender roles and gendered norms that foster inequalities in power relations, division of labour, and trust in authoritative figures [26]. And access to health care. It is possible that the young sample did not experience the kind of gender disparities that produce health-based differences. Moreover, the women in the sample were unmarried, belonging to households managed by elder family members. Thus, the role of women as primary caretakers of the household, in charge of the health of other family members, did not seem to play a role in our study. Had the women been older married, and responsible for the health of their families, gender differences could have emerged. Even more important than gender, it appears to be the factor of age as far as the perceived threat of the virus is concerned. There is a vast amount of research evidence to support the finding that there are clear age differences in threat and fear perceptions of Covid-19, including progressively higher threat and fear perceptions of Covid-19 as respondents age. This trend may be due to a decline in immune

function as one age. However, the present study did not include the age variable. Future research must therefore investigate the intersection between age and gender with respect to the perceived threat of Covid-19 in older samples.

The second phase of the study was reformulated to identify the factors that produce non-compliance with preventative measures. While only a few people did not comply because they were unafraid of the virus or thought that they would recover if they got tested positive, the primary causes of low compliance were high rates of vaccination and pandemic fatigue. Vaccinations have emerged as a powerful weapon in the global struggle against the pandemic. India has seen a slow but steady rise in vaccination rates. While vaccination is highly recommended by experts, its impacts on other preventative Behaviours are not entirely encouraging. For instance, in a survey conducted in the United Kingdom in 2020, young people tended to comply less or not comply at all with the government guidelines following vaccination [27]. Vaccinated individuals show low scores on compliance, perhaps due to the common perception that being vaccinated reduces the risk of getting infected with the virus. While this is true, it is also true that vaccines do not confer immediate or complete immunity, and vaccinated individuals may still be at risk of transmitting the virus [28] a fact that tends to be minimized. An important concept to be taken into consideration here is risk compensation, also called the Peltzman Effect. One review of the Peltzman Effect identified 4 main factors to contribute to risk compensation [29]. Interestingly all these factors seem to be present with respect to the pandemic. The first of these is the finding that to produce an increase in risky behavior, a measure must first be *visible*, which vaccines clearly are. The next 2 factors are *motivation* and *control*. Risk compensation is more likely to occur when a person is highly motivated to take the risk and if it is within their control to do so. These are applicable to the current pandemic as people may be highly

motivated and capable of seeing friends, attending gatherings, and traveling. The last factor, the overall *effectiveness* of the intervention, depends on the vaccine. The vaccines being used in India have been hailed as having over 75% efficacy in preventing serious disease and death. Another feature of the Peltzman Effect is that it may have a bystander component. It is possible that simply witnessing someone else taking a precaution can potentially increase one's likelihood of taking a risk. Even those who have not received a Covid-19 vaccine may forgo masks and social distancing if they know that others are receiving the vaccine. Infact the anticipation of a vaccine induces less careful pandemic behavior, likely translating to a substantial increase in cases [30]. A particularly plausible explanation for people becoming less careful is that good news can lead to a good mood. The bulk of news related to the pandemic tends to be worrisome and negative. So, news in its context is rare and thus can provide a sharp contrast and induce optimism. Optimism in turn can produce lower risk perceptions and less caution. Information about the potential end to the worst that the pandemic had to offer makes normal everyday life more salient and accessible. This could make people more impatient, worsening their intended social distancing behavior. The willingness to take risk was compounded further by pandemic fatigue and a low death threat. Only 3 out of 15 people in the study's second phase believed that the virus could result in them dying. This low perceived threat may very well be a function of the sample's age and access to health facilities.

Coming to the matter of fatigue, the time at which the data was collected was well into the second year of the pandemic. This was a time when research had begun to establish the existence of pandemic fatigue in several different countries. Pandemic fatigue has been explained as the demotivation to follow recommended protective Behaviours, emerging gradually over time, and affected by a number of emotions, experiences, and perceptions" [31]. It

is expressed on a behavioural level by showing an increase in non-compliance with Covid-19 health protective measures. Further, evidence shows that people who are at low risk of Covid-19 (i.e., younger, healthier people) tend to experience more Pandemic Fatigue [31], as was the case with the present sample. According to the WHO (2020) several cognitive components related to individual motivation have been impacted by the longevity of the pandemic. First, the perceived threat of the virus may decrease as its novelty decreases, even if objective data indicates that the risk may be increasing. At the same time, perceived losses resulting from lockdowns are likely to increase with time as people experience the long-term consequences of restrictions. Thus, for some people, the balance may alter, and the perceived costs of the response may start to outweigh the perceived risks. It has also been suggested that a desire for self-determination may grow as restrictions continue. Finally, even the most outrageous circumstances become normal when experienced over longer periods of time. People may habituate to the pandemic and complacency may result, as was seen in this study.

### **Implications**

This study identifies the need to address vaccine-related changes in precautionary behaviour and the experiences of pandemic fatigue.

The need to hour appears to be to make the public at large more aware of these phenomena and equip them to deal with both. So far discussions on national and international platforms have been limited to the need to mask, socially distance, and get vaccinated. Yet as the pandemic moves into a new phase, the focus of discussions must shift to how unrealistic optimism created by vaccines and the mental fatigue caused by the new normal may be coped with.

One possibility could be to have doctors and nurses tell vaccine receivers about the continued susceptibility to surges and the need to maintain

protocol. What may be risky and safe for a vaccinated person may be discussed and made a part of health promotion programs. Mental health professionals, especially in the Indian setting, need to create awareness of efficacious strategies to combat fatigue. Suggested by the WHO focuses on how policy makers package the messages they give safety protocols. These include helping the public differentiate between lower-risk and higher-risk activities, developing guidance on how to carry on with life while reducing the risk of transmission, sticking with recommendations rather than constantly changing them, encouraging people to identify harm-reduction strategies that fit their needs and shifting messaging from “do not” to “do differently.” There is now a need to test the efficacy of these suggestions with the public so that the costs of continued adherence appear smaller than the benefits of following them.

### **Limitations and Directions for Future Research**

The primary method of data collection used in the study was the survey method. Hence, the disadvantage of social desirability associated with self-report measures was a key constraint of the study.

Another limitation was the usage of a relatively small sample size predominantly belonging to urban areas. Future studies should concentrate on collecting data from a wider population with diverse demographics in terms of age, locality, socioeconomic status, etc. Since the study was retrospective in nature, it is possible that participants engaged in recalling bias, i.e., they were less likely to recall information accurately at the time of filling out the questionnaire. An attempt should be made for future studies to be conducted during peak periods of active Covid-19 cases to gain a better understanding of gender disparities as well as the link between fear and compliance. Technology that collects data in real time may be best suited for this purpose.



## Conclusion

While the differences between men and women in fear and compliance to preventive behaviour during Covid-19 in India were found to be insignificant, the present study attempts to increase the limited literature on gender discrepancies with respect to the pandemic in India, thereby providing a critical platform for more future research to be carried out on these variables. Considering that compliance with preventative measures is critical during Covid-19 to protect oneself and others in one's close surroundings from the virus, the study provides crucial information for policy makers as public health policies should target young men and women only after understanding the influence of gender on following the Covid-19 measures.

## Declarations

1. Funding: The authors did not receive support from any organization for the submitted work.
2. Conflicts of interest/Competing interests: The authors have no competing interests to declare that are relevant to the content of this article.
3. Ethics approval: All ethical guidelines were followed during the study.
4. Consent to participate: Consent to participate was taken from each participant.

## References

- [1]. MoHFW | Home. (2020). Ministry of Health and Family Welfare. <https://www.mohfw.gov.in/>.
- [2]. Dukhi, N., Mokhele, T., Parker, W. A., Ramlagan, S., Gaida, R. & Mabaso, M. et al. (2021). Compliance with lockdown regulations during the Covid-19 pandemic in South Africa: Findings from an online survey. *The Open Public Health Journal*, 14(1), 45–55. <https://doi.org/10.2174/1874944502114010045>.
- [3]. Khare, B. V. (2021, April 17). India's Kumbh festival attracts big crowds amid devastating second Covid wave. *BBC News*.

5. Consent for publication: Not applicable.
6. Availability of data and material: "The data that support the findings of this study are available from the corresponding author upon request.
7. Code availability: Not applicable (software application or custom code).
8. Authors' contributions: All authors have equally contributed to the designing of the study, data collection, analysis, and writing of the manuscript. Material preparation, data collection, and analysis were performed by all authors. The first draft of the manuscript was written by Shruti Jhamb, Devashri Bhargava, and Megha Dhillon. All authors commented on previous versions of the manuscript. All authors read and approved the final manuscript.

## Conflict of Interest

The authors have no conflict of interest to report.

## Acknowledgment

The authors thank the Department of Psychology of Lady Shri Ram College for Women for encouraging research initiatives. They would like to extend their gratitude to Dr. Megha Dhillon for providing helpful suggestions and guidance in the process of this research.

<https://www.bbc.com/news/world-asia-india-56770460>.

- [4]. Pandey, B. V. (2021, May 5). Coronavirus: How India descended into Covid-19 chaos. *BBC News*. <https://www.bbc.com/news/world-asia-india-56977653>.

- [5]. Roy, S. (2022, January 5). Covid caution: 10k challans worth Rs 2 crore issued in Delhi in first 2 days of 2022. *The Times of India*. <https://timesofindia.indiatimes.com/city/delhi/Covid-caution-10k-challans-worth-rs-2cr-issued-in-first-2-days-of-2022/articleshow/88698399.cms>.

- [6]. Salgado, S., & Berntsen, D. (2021). "It won't happen to us": Unrealistic optimism affects Covid-19

- risk assessments and attitudes regarding protective behaviour. *Journal of Applied Research in Memory and Cognition*, *10*(3), 368–380. <https://doi.org/10.1016/j.jarmac.2021.07.006>.
- [7]. Cohn, L., & Esparza-Del Villar, O. (2015). Fatalism and health behavior: a meta-analytic review. <http://doi.org/10.13140/RG.2.2.10843.98085>.
- [8]. Loke, A., Mak, Y., & Wu, C. (2016). The association of peer pressure and peer affiliation with the health risk Behaviours of secondary school students in Hong Kong. *Public Health*, *137*, 113–123. <https://doi.org/10.1016/j.puhe.2016.02.024>.
- [9]. SoleimanvandiAzar, N., Irandoost, S. F., Ahmadi, S., Xosravi, T., Ranjbar, H., Mansourian, M., & Yoosefi Lebni, J. (2021). Explaining the reasons for not maintaining the health guidelines to prevent Covid-19 in high-risk jobs: a qualitative study in Iran. *BMC Public Health*, *21*(1). <https://doi.org/10.1186/s12889-021-10889-4>.
- [10]. Rosenstock, I. M., Strecher, V. J., & Becker, M. H. (1988). Social Learning Theory and the Health Belief Model. *Health Education Quarterly*, *15*(2), 175–183. <https://doi.org/10.1177/109019818801500203>.
- [11]. Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. [https://doi.org/10.1016/0749-5978\(91\)90020-t](https://doi.org/10.1016/0749-5978(91)90020-t).
- [12]. Wollast, R., Schmitz, M., Bigot, A., & Luminet, O. (2021). The Theory of Planned Behavior during the Covid-19 pandemic: A comparison of health Behaviours between Belgian and French residents. *PLoS One*, *16*(11), e0258320. <https://doi.org/10.1371/journal.pone.0258320>
- [13]. Rice, R. E. (2006). Influences, usage, and outcomes of Internet health information searching: Multivariate results from the Pew surveys. *International Journal of Medical Informatics*, *75*(1), 8–28. <https://doi.org/10.1016/j.ijmedinf.2005.07.032>.
- [14]. Galasso, V., Pons, V., Profeta, P., Becher, M., Brouard, S., & Foucault, M. (2020). Gender differences in Covid-19 attitudes and behavior: Panel evidence from eight countries. *Proceedings of the National Academy of Sciences*, *117*(44), 27285–27291. <https://doi.org/10.1073/pnas.2012520117>.
- [15]. Frederiksen B., Gomez I., Salganicoff A., Ranji U. (2020, March 20). *Coronavirus: A Look at Gender Differences in Awareness and Actions*. KFF. <https://www.kff.org/womens-health-policy/issue-brief/coronavirus-a-look-at-gender-differences-in-awareness-and-actions/>.
- [16]. Haischer, M. H., Beilfuss, R., Hart, M. R., Opielinski, L., Wrucke, D., Zirgaitis, G., Uhrich, T. D., & Hunter, S. K. (2020). Who is wearing a mask? Gender-, age-, and location-related differences during the Covid-19 pandemic. *PLoS One*, *15*(10), e0240785. <https://doi.org/10.1371/journal.pone.0240785>.
- [17]. Griffith, D. M., Sharma, G., Holliday, C. S., Enyia, O. K., Valliere, M., Semlow, A. R., Stewart, E. C., & Blumenthal, R. S. (2020). Men and Covid-19: A Biopsychosocial Approach to Understanding Sex Differences in Mortality and Recommendations for Practice and Policy Interventions. *Preventing Chronic Disease*, *17*. <https://doi.org/10.5888/pcd17.200247>.
- [18]. Peckham, H., de Gruijter, N. M., Raine, C., Radziszewska, A., Ciurtin, C., Wedderburn, L. R., Rosser, E. C., Webb, K., & Deakin, C. T. (2020). Male sex identified by global Covid-19 meta-analysis as a risk factor for death and ICU admission. *Nature Communications*, *11*(1). <https://doi.org/10.1038/s41467-020-19741-6>.
- [19]. Jin, J. M., Bai, P., He, W., Wu, F., Liu, X. F., Han, D. M., Liu, S., & Yang, J. K. (2020). Gender Differences in Patients with Covid-19: Focus on Severity and Mortality. *Frontiers in Public Health*, *8*. <https://doi.org/10.3389/fpubh.2020.00152>.
- [20]. Mangia, C., Russo, A., Civitelli, S., & Gianicolo, E. (2020). Differenze sesso/genere nella letalità Covid-19: cosa dicono e non dicono i dati [Sex/gender differences in Covid-19 lethality: what the data say, and do not say]. *Epidemiologia e prevenzione*, *44*(5-6 Suppl 2), 400–406. <https://doi.org/10.19191/EP20.5-6.S2.145>.
- [21]. Ahorsu, D. K., Lin, C. Y., Imani, V., Saffari, M., Griffiths, M. D., & Pakpour, A. H. (2020). The Fear of Covid-19 Scale: Development and Initial Validation. *International Journal of Mental Health and Addiction*. <https://doi.org/10.1007/s11469-020-00270-8>.

- [22]. Firouzbakht, M., Omidvar, S., Firouzbakht, S., & Asadi-Amoli, A. (2021). Covid-19 preventive Behaviours and influencing factors in the Iranian population; a web-based survey. *BMC Public Health*, 21(1). <https://doi.org/10.1186/s12889-021-10201-4>
- [23]. P. (2022, January 13). A deadly Delta wave stole 2,40,000 lives in India between April-June, “similar episodes” could take place in the Economic Times. <https://economictimes.indiatimes.com/news/india/deadly-delta-wave-stole-240000-lives-in-india-between-april-june-similar-episodes-could-take-place-in-near-term-un-report/articleshow/88883714.cms?from=mdr>.
- [24]. Alsharawy, A., Spoon, R., Smith, A., & Ball, S. (2021). Gender Differences in Fear and Risk Perception During the Covid-19 Pandemic. *Frontiers in Psychology*, 12. <https://doi.org/10.3389/fpsyg.2021.689467>.
- [25]. Rattay, P., Michalski, N., Domanska, O. M., Kaltwasser, A., de Bock, F., Wieler, L. H., & Jordan, S. (2021). Differences in risk perception, knowledge, and protective behaviour regarding Covid-19 by education level among women and men in Germany. Results from the Covid-19 Snapshot Monitoring (COSMO) study. *PLoS One*, 16(5), e0251694. <https://doi.org/10.1371/journal.pone.0251694>.
- [26]. Siegrist, M., Gutscher, H., & Earle, T. C. (2005). Perception of risk: the influence of general trust, and general confidence. *Journal of Risk Research*, 8(2), 145–156. <https://doi.org/10.1080/1366987032000105315>.
- [27]. YouGov. YouGov/ sky survey results, 2020. Available: [https://docs.cdn.yougov.com/8jj48ajo8c/SKY\\_Vaccine\\_201203.pdf](https://docs.cdn.yougov.com/8jj48ajo8c/SKY_Vaccine_201203.pdf).
- [28]. Wright, L., Steptoe, A., Mak, H. W., & Fancourt, D. (2021). Do people reduce compliance with Covid-19 guidelines following vaccination? A longitudinal analysis of matched UK adults. *Journal of Epidemiology and Community Health*, jech-2021. <https://doi.org/10.1136/jech-2021-217179>.
- [29]. Hedlund, J. (2000). Risky business: safety regulations, risk compensation, and individual behavior. *Injury Prevention*, 6(2), 82–89. <https://doi.org/10.1136/ip.6.2.82>.
- [30]. Andersson, O., Campos-Mercade, P., Meier, A. N., & Wengström, E. (2021). Anticipation of Covid-19 vaccines reduces willingness to socially distance. *Journal of Health Economics*, 80, 102530. <https://doi.org/10.1016/j.jhealeco.2021.102530>.
- [31]. Lilleholt, L., Zettler, I., Betsch, C., & Böhm, R. (2020). Pandemic Fatigue: Measurement, Correlates, and Consequences. *PsyArXiv Preprints*. <https://doi.org/10.31234/osf.io/2xvbr>.