RISK-TAKING BEHAVIOUR, PROSOCIAL BEHAVIOUR, AND VACCINE HESITANCY AMONG ADULTS WHO TOOK THE SECOND AND THE BOOSTER DOSE OF THE COVID-19 VACCINE

Goodwin Solly[1](M.Sc Psychology), Dr. Jessy Fenn[2](Assistant Professor)

Department of Psychology[1,2]

Rajagiri College of Social Sciences (Autonomous), Kalamassery, Cochin, India

Abstract

During COVID-19, quick advancements were made in the field of vaccines, which brought about the growth of several controversies about the safety of vaccines. Under the shadow of those controversies, we hypothesize that those who took vaccines could be higher risk takers and more pro-social as they took the vaccine decision to protect themselves and others. This study helps us determine "The Risk-taking Behaviour, Prosocial Behaviour, and Vaccination Hesitancy among Adults Who Took the Second and Booster Dose of the COVID-19 Vaccine". Purposive sampling was used to collect responses from 313 persons aged 18 to 40 on the vaccination hesitancy scale, prosocialness scale, and risk-taking scale, respectively. We conducted descriptive statistics, Spearman's correlation, the Mann-Whitney U test, and regression analysis. Results showed that there was no significant relationship between vaccine hesitancy and various doses of vaccines, and also no relationship between vaccine hesitancy and prosociality among adults who took multiple doses of vaccines; Interestingly, there was a negative relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccines. There was a negative relationship

between vaccine hesitancy and the first dose; there is no significant relationship between vaccine hesitancy and subsequent vaccine doses.

Keywords: COVID-19, Vaccine Hesitancy, Prosocial Behaviour, Risk Taking, Second Dose and Booster Dose

Chapter - I

COVID-19 is widely acknowledged as the most significant pandemic of the 21st century. Extensive research has been conducted to unravel the origins of the SARS-CoV-2 virus, but further investigation is required to establish conclusive evidence. Both the Middle East respiratory disease (MERS) and severe acute respiratory syndrome (SARS) coronaviruses are known to have originated in bats. The virus initially emerged in a limited manner in November 2019, with the first notable cluster appearing in December 2019 in Wuhan, China. Initially, it was presumed that SARS-CoV-2 had transmitted from animals to humans at one of Wuhan's open-air "wet markets." Subsequent theories suggested the possibility of its development in a Chinese laboratory as a potential biological weapon. In 1965, scientists identified the first human coronavirus, which was associated with causing common colds. In the subsequent years, researchers made a significant discovery of a group of closely related viruses found in humans and animals, characterized by their distinctive crown-like appearance. (Rath, 2020)

As the SARS-CoV-2 virus expanded within and outside China, it affected individuals without direct contact with animals. This indicated that the virus is transferred between humans. Due to its rapid expansion, people inadvertently transmit the coronavirus in the United States and worldwide. The global transmission was a pandemic. Currently, there are two potential explanations regarding the origins of the virus: transmission from an infected animal and the possibility of laboratory creation. There is insufficient evidence to support either position. Based on the latest intelligence sources, it has been determined that the virus is not genetically engineered or intentionally developed as a biological weapon. However, there is a possibility that the coronavirus variant was under investigation in a laboratory setting, specifically regarding

its impact on animals, and an accidental exposure might have occurred. Nevertheless, a definitive conclusion cannot be reached at this time due to insufficient evidence. (Rath, 2020)

Feelings of fear, anxiety, and stress are natural responses when faced with perceived threats, uncertainty, or unfamiliar circumstances. Therefore, it is reasonable and understandable for individuals to experience fear in response to the COVID-19 pandemic. In such a widespread outbreak like COVID-19, the fear of contracting the virus is intensified by significant alterations to our daily routines, as we are required to limit our movements to mitigate and contain the spread of the virus.

Throughout the COVID-19 pandemic, the World Health Organization (WHO) and its collaborators provided guidance and support to healthcare professionals, healthcare facility administrators, individuals responsible for caring for children and older adults, people in isolation, and the general public to safeguard their mental well-being. In light of the altered circumstances, such as remote work, temporary job loss, homeschooling children, and a lack of physical contact with extended family, friends, and classmates, efforts were made to prioritize both physical and mental health. (Mental Health and COVID-19, 2022)

The development of vaccination for COVID-19 was a challenging job for researchers who practice in that field. From previous experiences and studies, it is clear that vaccination can help us significantly prevent getting affected by different diseases. The World Health Organization believes that between 2010 and 2015, immunizations helped avoid at least 10 million deaths worldwide. Vaccines lessen the likelihood of contracting a disease by collaborating with the body's natural defences to generate immunity. (Fridman et al., 2021) Upon receiving a vaccine, the immune system initiates a response. Presently, vaccinations are available to protect against more than twenty severe diseases, enabling people of all age groups to lead longer and healthier lives. Currently, immunization efforts prevent approximately 3.5 to 5 million deaths annually caused by diseases like diphtheria, tetanus, pertussis, influenza, and measles. (World Health Organization: WHO, 2019) The introduction of a new vaccine to the general population involves several stages, which encompass vaccine development, clinical trials, FDA licensure or approval, production, and distribution. Various public and private entities have collaborated extensively to make COVID-19 vaccines accessible to the public. Despite the accelerated development of these vaccines, thorough measures have been implemented to guarantee their safety and effectiveness. (CDC, 2020)

Many companies volunteered to produce COVID-19 vaccines during the pandemic. In December 2020, the Pfizer/BioNTech vaccine became the first to receive emergency approval from the World Health Organization (WHO). Subsequently, by May 2021, the WHO granted emergency authorization for vaccines created by AstraZeneca-SK Bio, Serum Institute of India, Janssen, and Moderna. In India, people have access to COVAXIN, COVISHIELD, and Sputnik vaccines. In India, the Central Drugs Standard Control Organization (CDSCO) authorized the emergency use of two vaccines: Covishield (AstraZeneca's vaccine produced by Serum Institute of India) and Covaxin (manufactured by Bharat Biotech Limited). Emergency use authorization for Sputnik-V was granted in April 2021. Official data shows that over 75% of adults in India have completed the full COVID-19 vaccination course. (TIMESOFINDIA.COM, 2022) 69.7% of the world's residents have received at least one shot of a COVID-19 vaccine. (Mathieu, 2020) Globally, 12.12 billion doses have been administered, and 6.08 million doses are administered daily. In low-income nations, just 20.2 percent of the population has received at least one dose. (Mathieu et al., 2021)

For every coin, there is a head and tail. There are so many pros and cons spreading around the world about the COVID-19 vaccine. People have different attitudes towards vaccination, and many conspiracy theories run online. Conspiracy theories are "attempts to explain the ultimate causes of important social and political events and circumstances with claims of secret plots by two or more powerful actors" (*Vol. 15, No. 4, Dec., 1994 of Political Psychology on JSTOR*, 1994-b) In various countries, individuals, including anti-vaccination activists, have spread baseless conspiracy theories and misinformation regarding COVID-19 vaccines. These misleading claims are often rooted in misinterpreted or misrepresented scientific findings, religious beliefs, exaggerated assertions about potential side effects, unfounded connections between COVID-19 and 5G technology, and other false or inaccurate information. Unfortunately, disseminating this inaccurate information has contributed to a significant number of individuals developing opposition towards vaccination. (*COVID: Top 10 Current Conspiracy Theories - Alliance for Science*, 2020). The widespread dissemination of this misleading information has led to a considerable number of individuals becoming hesitant or unwilling to receive vaccinations. Consequently, governments and commercial entities have implemented various strategies, including lotteries, mandates, and offering free access to events, in order to promote or enforce vaccination. However, these efforts have also contributed to additional confusion

regarding the legality and efficacy of such measures. (Gore, 2021). Vaccine reluctance has directed to a drop in vaccination-taking rates and an increase in the prevalence of diseases that can be prevented by vaccination (VPDs)(*Identifying and Addressing Vaccine Hesitancy*, 2015). According to Chief Minister Pinarayi Vijayan, around 9 lakh people in Kerala, including those over 60 and those with co-morbidities, are unwilling to receive the Covid-19 vaccination. (Philip, 2021). Pope Francis urged the world community to increase Covid immunization and stated that "reality therapy" was necessary to combat "false information" discouraging people from receiving vaccinations. The Argentine pontiff, who previously referred to vaccination as "an act of love," encouraged world governments to ensure everyone had access to immunizations. (*Pope Urges Sceptics to Adopt &Quot;Reality Therapy&Quot; and Get Vaccinated*, 2022-b)

Young people's risk-taking and decision-making behaviours are similar to those of adults, yet, numerous youth-relevant drivers of behaviour have the potential to enhance the efficacy of COVID-19 policies or tactics aimed at this sector of the population. As with most behavioural treatments, a comprehensive strategy addressing environmental, social, cognitive, and motivational aspects will be required to support the adoption of the necessary preventive behaviours. Regarding COVID-19 infections, certain behaviors, such as smoking, excessive alcohol consumption, absence of physical activity, overweightness, and unhealthy eating habits, contribute to an increased risk of severe consequences. As a result, individuals who engage in these behavioural risk factors require heightened anti-infective measures. The majority of reported adverse reactions to COVID-19 vaccines were of mild to moderate intensity and resolved within a few days. Typical adverse reactions include injection-site pain, fever, tiredness, headache, muscular soreness, chills, and diarrhea. The likelihood that any of these negative effects will develop following vaccination depends on the vaccine (World Health Organization: WHO, 2021).

Vaccination not only gives a direct personal advantage to the vaccinated individual, but it also provides an indirect societal benefit to unvaccinated people, such as those who are too young, ill, or incapable of being vaccinated for other reasons. Vaccination can thus be viewed as a pro-social act, in the view that it benefits others and transcends just self-interest (Bauch & Earn, 2004). Nonetheless, when vaccination rates rise, free riding is more likely. In other words, individual decision-makers are incentivised to depend on the indirect protection offered by vaccinated others and avoid the effort and danger of vaccine

side effects. Other studies examined whether those with more vital pro-social concerns, as measured by pro-social qualities and preferences or empathy for helpless others, are more likely to get vaccinated. (Thielmann et al., 2020)

Pro-social activity is an activity that benefits others, regardless of the cost to the individual. Pro-social conduct has garnered considerable interest in a psychology study, encompassing several necessary social actions such as aiding, sharing, cooperating, and donating to charity. Through herd immunity, influenza vaccination benefits others. In this study, we utilise the word "prosociality" to describe the motive for influenza vaccination, which is meant to help others. Due to the asymmetric nature of influenza transmission and illness, altruism is of utmost importance in flu vaccination: Young people are responsible for the majority of the spread (Longini et al., 1982), but in a typical year, 90% of flu-related deaths occur to those above 65 years of age (Estimates of Deaths Associated With Seasonal Influenza --- United States, 1976--2007, 2010).

Preliminary studies indicate a strong correlation between vaccination, engagement in risk-taking behaviour, and pro-social activities amidst the COVID-19 pandemic.

The rationale of the study

The COVID-19 epidemic has caused significant harm to the public mental and physical health. It has had a considerable effect worldwide, causing enormous anguish everywhere. Due to the physical or social separation measures and lockdown laws enacted in reaction to COVID-19, adults worldwide were encouraged to remain at home. For young emerging adults, this circumstance has caused them to lose touch with their classmates and spend more time with their families and on social media sites. Despite the development of vaccines aimed at mitigating the impact of COVID-19, there is a lack of universal satisfaction with their effectiveness due to various factors. These include instances where individuals still experience COVID-19 symptoms despite being vaccinated, the proliferation of fabrication on social media platforms, concerns related to allergies or specific health conditions, and the persistence of COVID-19 myths. Due to several factors, only some are fully immunized. Government coercion paired with widespread panic during the first wave of Covid led to 73.7% of citizens being vaccinated with the first dose. However, the subsequent doses have been given less push and primarily depend on the person's choice, and 66.5%

have been fully vaccinated. Currently, in India, there are different types of vaccines with different doses and biological features. The country's total count of COVID-19 vaccines approved emergency use authorization has now reached eight with the latest additions.

Prior to this, six vaccines had already obtained EUA, namely Serum Institute's Covishield, Bharat Biotech's Covaxin, Zydus Cadila's ZyCoV-D, Russia's Sputnik V, and the US-manufactured Moderna and Johnson & Johnson vaccines. (*Covovax, Corbevax Vaccines, Anti-Viral Drug Molnupiravir Cleared in India*, 2021) Vaccine varies basically because of how it is made. Three main approaches are employed in vaccine design, differing in their utilization of the entire virus or bacterium, specific sections of the pathogen that trigger the immune response, or solely the genetic material responsible for instructing the production of particular proteins rather than the complete virus. (World Health Organization: WHO, 2021a). But most commonly, when referring to the COVID-19 portal of the central government, the availability of Covaxin and Covidshield is only present most widely for usage in adults. Other vaccine names are available, so this study focuses only on those who took Covaxin and Covidshield.

Despite the many floating myths regarding the development of the COVID-19 virus and vaccination, some people trust scientific evidence and get vaccinated on time. This could be done for self-protection, to protect other vulnerable people from the infection, or a combination of both. This study explores whether the subsequent doses taken could indicate prosocial behaviour. However, studies also suggest high anxiety among people who are vaccinated. (Rizk & Ghanima, 2022). Other studies also show that people with high levels of education are less anxious than those who are uneducated (Świerad et al., 2022), thereby indicating the link between uncertainty and anxiety. Taking action even under situations of uncertainty means risk-taking.

The number of COVID-19-related studies is high during this era. Still, a survey of vaccination hesitancy and its connection to pro-social and risk-taking behaviour has yet to bet available. So, with the help of this study, we can find Risk-taking Behaviour, Prosocial Behaviour, and Vaccine Hesitancy among adults who took the second and the booster dose of the COVID-19 Vaccine.

Research Question

Whether there is a relationship between vaccine hesitancy, risk-taking behaviour and pro-social behaviour among adults after taking different doses of vaccine.

Objectives of the study

1. To study the relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccine.

2. To study the relationship between vaccine hesitancy and pro-social behaviour among adults who took various doses of vaccine.

3. To study the relationship between pro-social and risk-taking behaviour among adults who took various doses of vaccine.

4. To study the relationship between vaccine hesitancy, prosocial behaviour, and risk-taking between the genders.

Hypothesis

1. There is a relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccine.

2. There is a relationship between vaccine hesitancy and pro-social behaviour among adults who took various doses of vaccine.

3. There is a relationship between pro-social and risk-taking behaviour among adults who took various doses of vaccine.

4. There is a difference in the relationship between vaccine hesitancy, prosocial behaviour and risk-taking between the genders.

Chapter II

Review of Literature

Many studies have been conducted on COVID-19 and its interdisciplinary sections. This section discusses the few studies that have been shown previously and related to the current topic. An analysis of the literature will show experiments already performed in these sectors and the study's viability.

Vaccine Hesitancy

In 2011-12, Marlee Lameris, Catherine Schmidt, Brian Gleberzon, and Jillian Ogrady administered a cross-sectional study of Canadian Memorial Chiropractic College students. The research examined attitudes concerning vaccination. The study was carried out using an internet platform. The results indicate that the respondents were 43%. Over ninety per cent of pupils reported being immunized. Approximately half of the students felt ready to discuss vaccination with their patients, and two-thirds felt secure doing so. In different program years, 83.9% and 90% of students had a favourable attitude to vaccination. (*Attitudes Toward Vaccination: A Cross-sectional Survey of Students at the Canadian Memorial Chiropractic College*, 2013)

Steven Lloyd Wilson and Charles Wiysonge studied social media and vaccination reluctance in 2020. There are two approaches to assessing the results of vaccination reluctance. First, they utilize surveys to determine what percentage of the population in each nation believes vaccinations are hazardous (using Wellcome Global Monitor indicators for 137 countries). Second, they utilize the WHO's yearly immunization rate data for 166 nations. They found that as the use of social media for coordinating offline activities increased, there was a significant correlation with the belief that immunizations carry risks. In other words, the more people relied

on social media for organizing offline actions, the more likely they were to perceive immunizations as risky.

Moreover, foreign misinformation is statistically and practically predictive of a decline in the mean vaccination coverage over time. A one-point growth on a five-point misinformation scale is related to a two-percentage-point annual decrease in average vaccination coverage. They also discovered support for the relationship between extraneous misinformation and negative vaccination-related social media behaviour. The substantial consequence of foreign misinformation is a 15 percent rise in negative tweets about vaccines for the average country(Wilson & Wiysonge, 2020).

G.Troiano and A.Nardi (2021) researched to evaluate the issue of vaccination hesitation during the COVID-19 pandemic, with an emphasis on vaccine hesitancy toward the COVID-19 vaccine. In November 2020, they searched the internet database PubMed for original peer-reviewed publications (MEDLINE). The most crucial search phrases were "Vaccine reluctance AND COVID-19." They looked for journals published during the COVID-19 pandemic that described the phenomena of vaccination reluctance. According to the findings, fifteen studies were included in the review. Up to 86.1 percent of students and 77.6 percent of the general public accepted the COVID-19 vaccination; for the influenza vaccine, the highest acceptance rate was 69 percent. Several variables impacted approval or rejection (ethnicity, working status, religiosity, politics, gender, age, education, salary, etc.).

The main reasons often mentioned for vaccine refusal included a general opposition to vaccines, concerns about safety regarding vaccines developed quickly, considering the vaccine unnecessary due to the mildness of COVID-19, a general lack of trust, uncertainty about the

vaccine's effectiveness, the belief of having already gained immunity, and suspicions about the vaccine's source. (Troiano & Nardi, 2021).

In May 2021, a research study conducted by Cambridge University Press examined the hesitation towards COVID-19 vaccination among medical students in India. Between February 2 and March 7, 2021, an online questionnaire was completed by 1,068 medical students from 22 Indian states and union territories. The findings revealed that 10.6% of the participants showed reluctance towards getting vaccinated.

The reasons behind the medical students' hesitation included concerns about the safety and effectiveness of the vaccines, confusion about their eligibility for vaccination, and a lack of trust in government organizations. However, those who perceived higher risk of contracting COVID-19 were less hesitant to get vaccinated and participate in vaccine studies. Interestingly, medical students were more likely to gather information from social media rather than from their instructors at medical school if they had vaccine reluctance. When choosing between the available vaccines, Covishield and Covaxin, the students preferred Covishield.

Most students willing to get vaccinated believed that it was important for them to resume their clinical duties, attend in-person classes, and return to their normal lives. Additionally, about three-fourths of the medical students believed that COVID-19 vaccination should be mandatory for overseas travelers and healthcare workers. Notably, the previous immunization history of the students did not impact their reluctance towards the COVID-19 vaccine. To address this issue, targeted information campaigns, regulation of vaccine studies, public dissemination of safety and effectiveness data, and initiatives to build trust were suggested as potential strategies to reduce vaccine hesitation among medical students. (Jain et al., 2021)

In 2021, Nair, A.T., Nayar, K.R., Koya, S.F., et al. did qualitative research in the Malappuram District of Kerala, India. The study focused on social media, vaccine hesitancy, and the lack of trust in immunization programs. The participants included parents/caregivers, physicians, public sector health staff, alternative medical practitioners, field healthcare workers, teachers from districts with high and low vaccination coverage, and communication experts. The research involved in-depth interviews and focus group discussions. Various factors, such as healthcare providers lacking adequate knowledge, societal norms influenced by patriarchy, and negative perspectives on vaccines from naturopaths and homeopaths, contributed to the distrust between parents/caregivers and healthcare providers. Anti-vaccination organizations leverage social media to influence the beliefs and attitudes of caregivers. Notably, religion does not seem to play a significant role in developing vaccine resistance in this particular context. (Nair et al., 2021)

The research conducted by Feng-Jen Tsai, Hsiu-Wen Yang, Chia-Ping Lin, and Jeffrey Zen Liu aimed to evaluate the acceptance of COVID-19 vaccinations and the impact of risk perception on vaccine acceptance and personal health preventive measures in Taiwan. The study used a national cross-sectional investigation from October 19 to 30, 2020, with a final analysis of 1,020 individuals. Statistical analyses, including chi-square and logistic regression, were performed. Results showed that 52.7% of participants were willing to receive COVID-19 vaccinations. Additionally, 63.5% of participants perceived the severity of COVID-19 in Taiwan as "not serious," while over 40% expressed concerns about COVID-19 infection. Participants who had a stronger perception of the severity of COVID-19 had a significantly higher likelihood of refusing the vaccination (OR = 1.546). However, those who were concerned about infection had a lower likelihood of engaging in poor health protection behaviors (OR = 0.642). Reasons

cited for vaccine rejection included the perceived insufficient stringency of the Emergency Use Authorization (EUA) process (48.7%) and concerns about side effects (30.3%). Individuals who had previously refused other vaccinations were 2.44 times more likely to refuse COVID-19 shots. Age played a role in COVID-19 vaccination acceptability, with lower acceptance rates observed in Taiwan compared to other countries with a high standard of living. Among those who had previously declined vaccinations, older individuals or those with a college education or higher were less likely to acquire a COVID-19 vaccine. The relationship between risk perception and health-protective behaviors was positive, while the relationship between risk perception and COVID-19 vaccination acceptance was negative. (Tsai et al., 2021)

The emergence and rapid spread of COVID-19 have had a significant impact on people's lives. In response, multiple vaccines were developed in a remarkably short period to combat this epidemic. However, achieving a high vaccination coverage rate is essential to address this public health issue effectively. This relies on the widespread adoption of these vaccines, particularly among healthcare professionals who are at the forefront of the ongoing battle against COVID-19. They play a critical role in promoting and encouraging immunization against the SARS-CoV-2 virus. In wealthier nations, healthcare professionals exhibit varying degrees of hesitancy towards these vaccines, with rates ranging from 4.3% to 72.0%. However, there is limited research available on this topic in less developed countries. The study's objective (Zammit et al., 2022) was to assess the prevalence and correlation of SARS-CoV-2 vaccination reluctance among healthcare workers in Tunisia. The research was conducted using an online cross-sectional approach, and health professionals in Tunisia participated in the study between January 7 and January 21, 2021.

A minimum of 460 individuals were needed for the study. Participants were recruited using a snowball sampling method. Data were collected through a pre-established and pre-tested questionnaire, which was administered anonymously using a free Google form. The online questionnaire link was distributed, and participants completed it on their own. The responses were collected in a Google Sheet and then exported to SPSS software for analysis. Out of the initial 546 replies, 493 were considered valid for analysis. The average age of the participants was 37.4 years, with a standard deviation of 9.5 years. Females constituted 70.2% of the participants. Social media emerged as the most popular source of information about COVID-19. The study found that 51.9% of individuals had concerns or apprehensions about receiving the SARS-CoV-2 vaccine (with a 95% confidence interval of 47.5% to 56.3%). Female participants, those working far from the capital, and those who expressed worries about vaccine components were more likely to exhibit vaccine reluctance.

On the other hand, the study found that accessing the national COVID-19 information website helped reduce vaccine hesitancy among participants. Therefore, the study suggests that the communication strategy regarding COVID-19 vaccinations in Tunisia should be enhanced. Social media can serve as a cost-effective communication platform to address concerns and provide reassurance to Tunisian healthcare professionals regarding the safety of COVID-19 vaccines. It is important to pay special attention to women, paramedical professionals, and individuals residing in remote areas.

During a pandemic, not only do infectious diseases spread, but conspiracy theories also proliferate, which can impact the course of the pandemic. In a recent study conducted by Ripp and Röer (2022), they reviewed and evaluated research conducted during the first year of the pandemic that explored the relationship between COVID-19 conspiracy beliefs, infection-

preventive behavior, and willingness to receive vaccinations. The researchers conducted a comprehensive literature search using various databases such as COVID-19 Data Portal, APA PsycArticles, Psychology and Behavioral Sciences, Scopus, and PubMed. After removing duplicate papers, the remaining studies were subjected to title and abstract screening, followed by content analysis. Seventeen papers that met the inclusion criteria were included in the systematic literature review. Among these, twelve studies focused on infection-preventive behaviors, involving a total of 16,485 participants, while ten studies examined vaccine acceptance, involving 20,210 participants.

The findings of the study indicate an inverse relationship between confidence in COVID-19 conspiracy narratives and both vaccine acceptance and infection-preventive behavior. These results underscore the significance of conspiratorial narratives in shaping individuals' attitudes and behaviors. The study also highlights the need for consistent operationalization and use of the term "conspiracy belief" in future research. Additionally, the authors suggest exploring various explanatory techniques and potential moderator factors to gain a deeper understanding of the relationship between conspiracy theories and health-related preventive behavior in the context of the pandemic, one year after its outbreak.COVID-19 control attempts continue to be hindered by vaccine reluctance and rejection. Throughout the epidemic, scientists and journalists have ascribed slow COVID-19 vaccination rates to a changeable collection of reasons, including demographics, experiences during the pandemic's height, political views, and beliefs in conspiracy theories and disinformation. However, these elements have rarely been studied systematically, in conjunction with, or in conjunction with other potentially underlying psychological factors, limiting our knowledge of COVID-19 vaccination reluctance. This cross-sectional study (Stoler et al., 2022) evaluates a variety of previously established indicators of

COVID-19 vaccination reluctance using US survey data (N = 2055) obtained in July–August 2021. The survey included modules to evaluate multiple sociopolitical areas and antisocial and prosocial personality traits predicted to influence vaccination reluctance. Using logistic and multinomial regression, they discovered that believing in misinformation about the COVID-19 vaccinations was the most significant indicator of vaccine reluctance. Still, this frequent explanation may be endogenous to vaccine hesitancy. After excluding the belief in COVID-19 vaccine disinformation from the research, political attitudes explained more variation in vaccination reluctance, specifically vaccine rejection. Our findings help reconcile several contradictory results in the literature, with implications for future health teaching and research.

TikTok has been one of the most powerful social media platforms for converging and disseminating pandemic-related information. However, it remains unknown how vaccination-related visual details, including pro-vaccine videos, affect consumers. Using Betsch et al 5C.'s model and Ekman's basic emotion model (Wang & He, 2022) identified 200 trending videos on TikTok containing the hashtag #vaccine. It analyzed the types of vaccine-related beliefs and emotions expressed in the videos and the relationship between thoughts, emotions, and supportive comments. The most often reported thoughts and emotions were confidence and happiness, respectively; confidence (B = 14.84, P <0.05), surprise (B = 11.29, P <0.05), and melancholy (B = 37.49, P< 0.01) predicted the frequency of positive comments. This study extends the 5C paradigm of vaccination hesitancy to examine pro-vaccine information on social media and provides deep insights into the various ideas and emotions and their impacts. The practical ramifications of addressing vaccination reluctance are highlighted.

Risk-taking Behaviour

In Bangladesh, the new coronavirus disease 2019 (COVID-19) is present, and several control measures have been implemented to flatten the epidemic curve. Due to the existing demographic distribution in Bangladesh, about one-third of the entire population consists of young people. Consequently, their cautious conduct is crucial to the effectiveness of preventive programs. This exploratory study (Imtiaz et al., 2021) evaluated disparities in the adoption of mindful behaviours among young adults and assessed and compared the determinants of precautionary behaviour adoption among young adults residing in Dhaka and Tangail, a neighbouring district. Participating in the research were a total of 350 respondents from each district. Quantile regression modelling was used to identify determinants of adopting cautious behaviours and to compare these factors between the two districts. ANOVA and two-sample t-tests were performed to identify variations in precautionary behaviour among demographic categories of young adults. Individuals in Dhaka with postgraduate education and excellent mental health exhibited more appropriate conduct. Women from Tangail who did not experience psychological distress were likelier than men to engage in cautious actions. The two districts had no significant differences in adopting preventative practices to avoid COVID-19 among young adults. This study revealed that higher levels of self-control, education, and mental health greatly influenced the cautious actions of young individuals. The participants' increased knowledge did not result in greater adoption of preventive practices. Effectively, the government's intervention to keep people at a social distance and implementing a stringent lockdown in seriously impacted regions are possible urgent answers.

Fear of adverse reactions is one of the critical causes of reluctance to get COVID-19 vaccinations. The study's primary objective (Mohsin et al., 2022) was to examine the potential

adverse effects of COVID-19 vaccinations distributed in Bangladesh. The report was based on an anonymous online cross-sectional survey performed in Bangladesh in December 2021. This research was based on an anonymous online survey conducted in December 2021. The study included participants from Bangladesh aged 12 and above who had received at least one dose of COVID-19 vaccine. The primary outcome of the study was to assess the potential adverse effects of COVID-19 vaccinations, and statistical methods such as exploratory analysis, the Chi-square test, and logistic regression were employed. There was a total of 1,180 vaccinated individuals that participated in the trial. After receiving their COVID-19 vaccination, only 39.48% of subjects reported at least one adverse event. Pain at the injection site, fever, headache, redness/swelling at the injection site, and lethargy were the most frequently reported side effects, all of which were minor and lasted between one and three days. Individuals who received Pfizer-BioNTech and Moderna COVID-19 vaccines were more likely to experience side effects, with approximately 80% reporting such effects.

On the other hand, those who received Sinopharm and Sinovac vaccines had a lower likelihood, ranging from 21% to 28%, of experiencing side effects. Comparatively, the Oxford-AstraZeneca, Pfizer-BioNTech, and Moderna vaccines were 4.51 times, 5.37 times, and 4.28 times more likely, respectively, to cause adverse reactions compared to the Sinopharm vaccines. Certain demographic factors, such as being male, aged over 50, residing in urban areas, being a smoker, and having preexisting health conditions, were associated with a higher probability of experiencing adverse effects. The study also highlighted a lack of confidence in the effectiveness of vaccines and a considerable reluctance to administer COVID-19 vaccines to children aged five years and older and adults aged 70 years and older. Importantly, the study emphasized that COVID-19 vaccines have shown a low occurrence of side effects, underscoring their safety.

These findings should be widely shared to promote global acceptance and uptake of vaccinations.

The study "Depression, Risk Preferences, and the Taking of Risks Behavior" conducted in 2020 by Deborah A. Cobb-Clark, Sarah C. Dahmann, and Nathan Kettlewell, examines the influence of depression on individuals' risk choices and risk-taking behavior. Depression can impact how people process information and make decisions, particularly in situations involving risk and uncertainty. The researchers aimed to investigate how depressive episodes affect risk preferences and behavior.

Using comprehensive data from representative German households, the study found no significant difference in the behavioral risk preferences between mentally healthy individuals and those with depression. However, depression was associated with variations in people's self-reported risk preferences and risk-taking behaviors in specific contexts. The study developed a conceptual model and demonstrated that differences in risk-taking behavior among individuals with depression were primarily influenced by personality traits such as locus of control, optimism, and trust.

The results highlight the complexity of the relationship between depression and risk-taking behavior, indicating that the specific nature of the decisions being made can lead to more or less risk-taking. In the health domain, the findings align with the "depression gap" observed in stated risk preferences, where individuals with depression express a greater reluctance to take financial risks but exhibit a higher likelihood of lending money to friends. These findings suggest intricate connections between depression and the factors influencing risk-taking behavior, which can result in diverse outcomes depending on the decision context. (Cobb-Clark et al., 2021)

Immunocompromised (IC) individuals are at a greater risk than the general population for COVID-19 infections that are more severe. These patients deserve special care. (Mehrabi Nejad et al., 2022) The study aimed to evaluate the effectiveness of COVID-19 vaccinations in individuals with immunocompromising (IC) disorders, considering different vaccine types and the potential need for booster doses. A systematic search was conducted in PubMed, Web of Science, and Scopus databases for observational studies published between June 1, 2020, and September 1, 2021. The focus was on investigating seroconversion rates following COVID-19 vaccine administration in adult patients with IC disorders.

The meta-analysis included 81 papers following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses guidelines. Statistical analysis was performed using the R program, and subgroup and sensitivity analyses were conducted to explore sources of heterogeneity. The overall prevalence of seroconversion after the first, second, and third vaccine doses was calculated based on available data. mRNA vaccines showed higher immunogenicity after the second dose compared to vector-based vaccines, despite similar immunogenicity after the initial dose.

Regarding the etiology of IC disorders, transplant patients exhibited lower rates of seroconversion after the first and second doses compared to patients with malignancy or autoimmune illness. However, an upward trend in seroconversion was observed among transplant patients with each subsequent dose, indicating a potential benefit of booster doses. The findings suggested that the increasing trend in seroconversion following booster doses is generally positive.Based on the data, it is important to focus on transplant patients, who had the lowest initial response rates, to enhance their immune response. These findings provide valuable

insights into the effectiveness of COVID-19 vaccinations in individuals with IC disorders and emphasize the potential benefits of booster doses in this high-risk group.

As far as the authors (Wakabayashi et al., 2022) know, this is the first study to evaluate whether problem drinkers engaged in high-risk behaviours during the stay-at-home policy (e.g., dining out at a bar) during the COVID-19 emergency declaration. Researcher analysed data from the Japan COVID-19 and Society Internet Survey(JACSIS)study, a statewide web-based survey performed from August to September 2020. CAGE (Cut, Annoyed, Guilty, and Eye-opener) questions were used to identify problem drinkers among 12,076 current drinkers. A CAGE score of 4 indicated possible alcohol use disorder, while scores of 2 to 3 indicated potential alcohol abuse; persons with these scores were viewed as problem drinkers compared to light-or-no-risk drinkers with scores of 0 to 1. The outcome measured 18 behaviours contrary to the stay-at-home guideline, such as dining in a bar, meeting people, and visiting busy areas. During the first emergency declaration between April and May of 2020, these actions were restricted in Japan. Using multivariable logistic regression, the participants with potential alcohol use disorder exhibited 16 out of 18 risk-taking behaviours, including dining out at a bar (adjusted odds ratio (aOR): 2.08; 95% confidence interval (CI): 1.56–2.79), dining out at a restaurant (aOR: 1.79; 95% CI: 1.37–2.35), visiting friends (aOR: 1.81; 95% CI: 1.34–2.44), going to karaoke In addition, participants with potential alcohol abuse (CAGE score of 2 to 3) had 10 out of 18 behaviours against the stay-at-home policy: the corresponding aORs were 1.45 (95% CI: 1.25–1.67), 1.27 (95% CI: 1.12–1.44), 1.17 (95% CI: 1.01–1.36), 1.49 (95% CI: 1.17–1.91), and 1.19 (95% CI: 1.03–1.39), respectively. Men, a higher income and employment position, smoking, sleep deprivation, depression, and other mental disorders were significantly associated with

problem drinkers. Overall, problem drinkers were likelier to engage in high-risk behaviours against the stay-at-home strategy than light or no-risk drinkers.

The COVID-19 pandemic has had a significant impact on sexual activity, leading to a decrease in physical contact and sexual relationships between partners. To explore the various aspects of the protective motive theory in relation to sexual connections during the home quarantine period, (Maasoumi et al., 2022) conducted a cross-sectional online survey among Iranians undergoing in-home quarantine between July and December 2020. A convenience sampling method was employed, resulting in a sample of 716 participants. The survey included questions about demographic information and protective motive behavior in sexual relationships during the COVID-19 pandemic.

The data collected from the online survey were analyzed using SPSS 16 software, utilizing one-way ANOVA, independent t-tests, and Pearson correlation tests. The results revealed that the average age of the participants was 37.78 ± 8.34 years, with a majority being women (85.1%), married (91.3%), and having a college degree (90.1%). About 42.5% of participants were employed full-time, and 34.2% resided in Tehran. Television was the primary source of COVID-19 information for 49.9% of participants, and 63.3% reported that neither they nor their spouses had been infected with COVID-19.

Regarding protective motivation in sexual connections, employment status was the only variable that showed a significant difference ($p = 0.031$). Among the different categories of sexual contact, perceived response efficiency had the highest mean score (79.12), while perceived self-efficacy had the lowest mean score (69.92). Significant associations were found among the categories of protection motivation and sexual conduct, except for the link between perceived severity and perceived self-efficacy ($p = 0.067$).

The study's implications and summary indicate that employment status, place of residence, and age are linked to perceived vulnerability. Only employment status showed a correlation with sexual connections driven by protective motives. Overall, the participants demonstrated high levels of perceived severity, perceived susceptibility, perceived response efficiency, and perceived costs. They expressed a strong motivation for engaging in protective and preventative activities within their sexual relationships.

Based on the findings, future interventions should focus on improving general knowledge about the severity and susceptibility to COVID-19 and sexual behaviors. It is important to enhance perceived response efficacy and build self-efficacy in adopting protective behaviors through skill training. These measures can contribute to promoting safe sexual practices during the pandemic.

After receiving two shots of the mRNA-combined COVID-19 vaccine, individuals with compromised immune systems may not gain enough protection. The increased dosage may enhance the amount of protection against Covid-19. The purpose of this study (Jairoun et al., 2022) was to assess the knowledge, attitudes, and barriers to acceptance of the third COVID-19 vaccination booster dosage between the UAE population. From 25 August to 20 October 2021, Ajman University students and professors participated in an online descriptive cross-sectional community-based study. The English-language questionnaire consisted of two sections with a total of 22 questions. In Section one, respondents' demographic information was collected, and in Section two, 13 questions were utilised to assess respondents' knowledge and attitude on the third COVID-19 vaccine booster dosage. This research received 614 responses from participants. The 95% confidence interval (CI) for the average score on the knowledge section was [41%, 49%]. Participants who had relatives affected with Covid-19 (OR 1.46; 95% CI 1.05–2.02),

participants who had been ill with Covid-19 (OR 2.21; 95% CI 1.43–3.43), and participants who had received the first two doses of the COVID-19 vaccine had higher knowledge scores. The 95% confidence interval (CI) for the mean attitude score was [69.2%, 71.2%]. Under the local culture, the government and public health authorities should make the necessary efforts to boost vaccination acceptability and promote favourable attitudes toward the vaccine. Developing an educational framework that demonstrates to the general public the dangers of vaccination avoidance or delay would be an appropriate strategy for achieving this objective. In addition, health officials should pay greater attention to the incorrect information being distributed on the internet, particularly on social media. In addition, healthcare professionals should get training in vaccinology and virology to ensure they can comprehend significant advances in these domains and communicate the findings to their patients.

Sensation-seeking is a significant component behind positive and negative risk-taking among adolescents and young adults. Nonetheless, macro-factors such as the worldwide COVID-19 epidemic may alter sensation-seeking possibilities and harmful and positive risk-taking behaviours. Therefore, the primary objective of this study (te Brinke et al., 2022) was to explore the connections between sensation seeking and behaviours that are deemed positive or negative types of risk-taking in a sample of teenagers and young adults (N = 660, Mean = 22.91, Standard Deviation = 3.14). Using approaches from citizen science, negative risk-taking was characterised as accepting unacceptable risks, such as faking vaccination records or intentionally contracting COVID-19. Positive risk-taking was described as accepting socially acceptable risks, such as striking a balance between the risk of infecting older individuals and the urge to associate with peers. According to the findings, participants with more excellent sensation-seeking took more positive and negative COVID-19-related risks. According to the second research, the drive

to contribute to society was positively related to thrill-seeking. This suggests that during adolescence and early adulthood, sensation-seeking may motivate positive (i.e., socially accepted) and negative (i.e., socially unaccepted) risk-taking in a high-stakes global pandemic, arguing against a one-way negative relationship between sensation-seeking and risk-taking.

Throughout the epidemic, delivery riders have been on the front lines, but little is known about their health and safety during this period. This study conducted by (Tran et al., 2022) investigates delivery riders' health and safety concerns in Ho Chi Minh City, Vietnam, during the Covid-19 outbreak, especially during the second lockdown (May–October 2021). In August and September 2021, more than 800 bikers participated in an online poll. Following descriptive statistics, four logit models were fitted to assess the variables associated with (a) hand sanitization, (b) face shield use, (c) acquiring a new health condition, and (d) participating in risky traffic behaviours during the lockdown. Inconsistent adopters of health and safety measures tended to be male, older, less educated, and not immunised. In addition, they were under higher financial strain and had suffered a more significant income loss during the epidemic. They worked longer hours and felt more acute pressure at work to recoup the loss. Many drivers adopt unsafe traffic behaviours, such as speeding, due to job stress, lengthy work hours, and financial problems.

In contrast, cyclists adopted preventative health measures more frequently when employers and coworkers were more supportive. Fear of Covid-19 served as a facilitator as well. During the pandemic, job and financial stress and the anxiety of getting the virus contributed to new health problems. Again, employer and coworker assistance helped to lessen the likelihood of new health concerns developing. In Ho Chi Minh City and other megacities in the Global South employing tens of thousands of riders, ensuring their health and safety is crucial to benefit both

commercial enterprises and public health. Businesses should generally adopt a more significant role in this area (Tran et al., 2022).

Pro-social Behaviour

Toshiko Tanaka, Tsuyoshi Nihonsugi, Fumio Ohtake, and Masahiro Haruno conducted an online survey of 6,232 Japanese individuals to examine age- and gender-dependent differences in attitudes toward COVID-19 vaccination and the underlying psychological processes. Participants were invited to read one of nine possible COVID-19 vaccination messages and score their willingness to be vaccinated. In addition, 17 social personality characteristic scores and demographic information were obtained. Males 10–20 were shown to be the least receptive to vaccination. In addition, they discovered that prosocial qualities constitute the driving force for youth, whereas risk aversion and self-interest motivate older individuals. Moreover, an analysis of nine different messages revealed that for young people (especially males), the message emphasizing the majority's desire to vaccinate and scientific evidence for the safety of the vaccination had the most substantial positive influence on intention to be vaccinated, suggesting that the "majority + scientific evidence" message encourages young people to demonstrate their prosocial nature through action. (Tanaka et al., 2021)

In reaction to the COVID-19 issue, the hotel industry has faced several formidable obstacles. Based on situational crisis communication theory (SCCT), this study investigates how the hotel sector has developed tactics to shape the customer experience and satisfaction. By analysing 6556 COVID-19-related internet evaluations, a mixed-methods technique was utilised. The qualitative data imply that "rebuild tactics" dominated the reaction of the majority of hotels to the COVID-19 issue. At the same time, the quantitative findings corroborate the direct relationship between affective appraisal and cognitive effort and customer happiness. In addition,

the results demonstrate that hotels' crisis response tactics attenuate the impacts of affective appraisal and cognitive action on customer satisfaction. The study widens the application of SCCT in tourism research and contributes to a new understanding of health-related crisis management. (Yu et al., 2022)

The World Health Organization (WHO) recommended adopting precautions to avoid the spread of coronavirus. When a risk is perceived, preventative actions are necessary. The study by (Zaveh et al., 2022) examined individuals' preventive measures in the Iranian community regarding their knowledge and concern over COVID-19. This descriptive survey was done in the spring of 2021 with 342 respondents using the convenience sample technique. The instrument for data collection was a questionnaire developed by researchers and composed of three sections of demographic questions regarding awareness and fundamental concerns. The data was analysed using descriptive statistical techniques. In addition, the chi-square test and Spearman's correlation coefficient were employed to determine the relationship between questions and demographic data. Results indicated that 209 (61.1%) of respondents used masks outside at an extremely high level. Only 40 (11.7%) respondents perceived social distance standards (at least greater than 1.5 meters) to be extremely low. In addition, 309 (90.4% of respondents) cleansed their hands thoroughly to a moderate to a high degree. COVID-19 Preventive Behaviors among respondents were connected with their perceptions and worries over COVID-19 transmission, increasing their awareness of the illness and fostering societal concern about it.

Seasons of influenza may be unexpected and can swiftly harm people, particularly in densely populated locations. Prior research indicates that normative messaging may improve the voluntary distribution of public goods such as influenza vaccination. (Mussio & de Oliveira, 2022) Contribute to the literature by analysing the impact of the normative message on the

choice to receive influenza vaccination. In collaboration with University Health Services, they undertake a field trial on campus-dwelling undergraduate students. During the Fall, they promoted flu vaccination clinics using four posters distributed randomly by clusters of residences. The text on the posters varies to stress the unique advantages of the vaccination, the societal benefits, or both benefits simultaneously. They collected survey data from people vaccinated at vaccination clinics and those not vaccinated via an online survey. They discovered that normative communication boosts the proportion of students who receive the flu shot compared to when no message is sent. Regarding the chance of acquiring the flu vaccine, they highlight both the personal and social advantages of vaccination, resulting in the most significant rise in the vaccination rate (19–20 percentage point increase). However, vaccination rates did not meet the herd immunity criteria (70% of pupils were immunised). This study suggests that a pro-social factor in individual vaccination decisions should be considered when building vaccination programs. The outcomes of this normative, pro-social message experiment might be applied to other at-risk populations where the number of background dangers is significantly higher. This is particularly pertinent now, as new seasonal vaccinations are being introduced, and younger persons have the lowest vaccination rates.

Due to societal concerns, voluntary compliance with preventative and mitigating measures can play a vital role in halting the development of Covid-19. Existing economic models for disease transmission do not emphasize the potential impact of pro-social behaviour and general trust in forecasting preventative actions against Covid-19. This study (Umer, 2022) examines whether pro-sociality and public trust measured in the short run (2020 and 2019) and the long run (2015 and 2010) can predict attitudes toward stay-at-home behaviour and the intended stay-at-home behaviour in the Netherlands if the government mandates it due to Covid-

19. The results imply that these preferences favourably affect attitudes regarding remaining at home. In contrast to pro-sociality, trust is a steady and robust predictor of stay-at-home views in both the short and long term. On the other side, neither trust nor pro-sociality affects the intention to stay home if the government orders a lockdown. This is most likely owing to the time of the study coinciding with a significant decline in Covid-19 infections and the Dutch government's relaxing of lockdown restrictions.

The COVID-19 pandemic poses a societal problem: participating in preventative health practises is costly for individuals but provides societal advantages. The amount to which individuals internalize the social consequences of their activities may rely on their prosociality or inclination to conduct themselves in a manner that primarily helps others. (Fang et al., 2022) A nationally representative online survey in Germany (n = 5843) was administered to evaluate the effect of prosociality in preventing the transmission of COVID-19 during the second coronavirus wave. At the person's level, prosociality is positively associated with compliance with public health activities, such as mask-wearing and social distance. A one-SD increase in prosociality is related to a 0.3 SD increase in compliance (p <0.01). At the regional (NUTS-2) level, one standard deviation (SD) increase in average prosociality is related to an 11% lower weekly incidence rate (p<0.01) and a 2%p lower weekly growth rate (p<0.01) of COVID-19 cases, after accounting for a variety of demographic and socioeconomic characteristics. In locations with greater prosociality, compliance with public health practices is higher. Thus, our correlational findings support the widely held belief that voluntary behaviour modification plays a crucial role in combating the pandemic and, more generally, that social preferences may influence the collective action outcomes of a society.

The researcher's (Askarian et al., 2022) objective was to examine the COVID-19 vaccine acceptance rate and its determinants among healthcare professionals in a multicenter study. A cross-sectional, multicenter survey was performed from February 5 to April 29, 2021. The questionnaire included 26 items over six subscales. A forward stepwise logistic regression was used to investigate the variables and questionnaire factors associated with the desire to get the COVID-19 vaccine. Four thousand six hundred thirty individuals from 91 countries completed the survey. According to the United Nations Development Program 2020, 43.6% of participants hailed from low Human Development Index (HDI) regions, 48.3% from high and very high areas, and 8.1% from medium regions. The immunization refusal rate was 37% overall. Three of the six criteria on the questionnaire were substantially associated with vaccination intent. While 'Perceived advantages of the COVID-19 vaccination' (OR: 3.82, p-value0.001) and 'Prosocial norms' (OR: 5.18, p-value<0.001) were connected with vaccination acceptance, 'The vaccine safety/cost concerns' (OR: 3.52, p-value<0.001) was correlated with vaccination reluctance. Physicians and pharmacists were more ready to get the vaccination than others. The HDI, with OR: 12.28 and 95% CI: 6.10-24.72, was a powerfully favourable predictor of COVID-19 vaccine acceptability. This study demonstrated the 37% vaccination reluctance rate among our healthcare workers. Increasing vaccine benefits knowledge, combating misinformation, and bolstering prosocial norms would be the core focus areas for boosting vaccination coverage. The study also revealed that HDI is substantially connected with vaccination acceptance/reluctance, such that people residing in situations with a low HDI are more reluctant to get the vaccine.

Summary

Based on the aforementioned literature, it can be inferred that previous research indicates a relationship between vaccine hesitancy, pro-socialness, and risk-taking behaviors. However,

there is a scarcity of studies that have examined the combined influence of these three factors, particularly in the context of the profound impact of COVID-19 on global populations. These studies encompass diverse gender compositions and consider various socio-demographic characteristics. The majority of these studies have highlighted significant associations between these variables in one form or another.

Chapter III

Method

This chapter provides an in-depth explanation of the testing procedures implemented in the study. It also delves into the research design that was selected for this particular investigation. The study's research question and goals were also stated. It contains information about the participants, such as the criteria for inclusion in the study, how they were sampled, and who they were. The investigator mentions an operational definition to get a transparent understanding of the study of the variable focused on. The scales used for data collection, and the methodology used to analyse information are also mentioned in this chapter. Finally, moral thought within the method is discussed clearly.

Research Design

This study used a correlational approach using purposive sampling. Also, a comparison study was conducted based on gender and vaccination dose. A correlational design is one in which two or more variables are measured, and the statistical relationship between them is assessed without controlling the variables by the researcher.

Sample and Sampling

A total of 313 adults (n=313), consisting of 148 males and 165 females aged between 18 and 40, were included in the study. The participants were selected through purposive sampling and received either the second or the booster dose of Covaxin and Covidshield. People who meet the following inclusion-exclusion requirements are eligible for the study:

Inclusion criteria:

• Age Group: 18 to 40 years

• English Language Proficiency

• Second or booster dose already be taken

• People who took Covaxin or Covidshield

Exclusion criteria

• Individuals with substantial physical and psychological ailments

• Individuals lacking proficiency in the English language

• Single-dose vaccinated people

• People who took vaccines other than Covaxin or Covidshield

Operational Definitions

The subsequent operational definitions of the variables used in the study are provided below:

Vaccine hesitancy: Vaccine hesitancy is the unwillingness or delay in obtaining vaccines despite free or paid vaccinations being available. The idea comprises unambiguous refusals to be vaccinated, delaying vaccinations, accepting vaccines but being uncertain about their use, and using certain vaccines but not others. Vaccine hesitancy is operationally defined as the sum of the subject's scores on the Adults Vaccine Hesitancy scale.

Risk-Taking: Risk-Taking Behavior is the total of the subject's RT – 18 – risk taking subscale scores. Risk-taking behaviour refers to the inclination to participate in activities that can be damaging or hazardous. This may involve abusing alcohol, binge drinking, taking illegal drugs, driving under the influence, or engaging in unprotected sex.

Prosocial Behaviour: Prosocial Behaviour is operationally defined as the total of the subject's score on the Prosocialness Scale for Adults. Prosocial behavior was defined as behavior through which people benefit others(Eisenberg et al., 2015), including helping, cooperating, comforting, sharing, and donating (Eisenberg et al., 2006; Greener & Crick, 1999).

Tools

The following tools were used to assess risk-taking behaviour, prosocial behaviour, and vaccine hesitancy among adults who took the second and the booster dose of the covid-19 vaccine.

1. **Informed Consent Form**.

   The informed consent form provides a voluntary willingness to participate in the study. Before participating, the participant is provided with facts about the research goal and its potential risk.

2. **Socio-demographic Data Sheet**.

   After agreeing to participate in the study willingly, they filled in the socio-demographic details. The researcher prepared a socio-demographic sheet, including facts like age, gender, religion, residence, vaccine name, vaccine dose, and whether affected with COVID-19 or not (if yes, its severity: mild, moderate, severe).

3. **RT - 18** (de Haan et al., 2011)

   The RT-18 consists of 18 dichotomous yes/no statements assessed on two subscales of nine questions each: risk-taking and risk assessment. A high score on the risk-taking subscale suggests a high degree of an individual's actual risk-taking behaviour. In contrast, a high score on the risk assessment subscale implies little or no consideration of potential repercussions.

4. **Prosocialness Scale for Adults (PSA)** (Caprara et al., 2005)

   The Prosocialness Scale for Adults examines the prosocial conduct of a person. There are sixteen items in total. On a five-point Likert scale, participants respond for each prosociality question whether the statement was never/nearly never true (coded as 1), occasionally true (coded as 2), sometimes true (coded as 3), often true (coded as 4) or almost always/always true (coded as 5).

5. **Oxford COVID-19 Vaccine Hesitancy Scale**(Freeman et al., 2020)

   It is a seven-item measure from research involving 5,114 UK people proportionately sampled to echo the population's demographics for age, gender, ethnicity, income, and area. Item-specific answer choices, coded from 1 to 5, are utilised. In addition, there is a 'Don't know' option, which is not scored. The higher the score, the greater the vaccination unwillingness. The Oxford COVID-19 Vaccine Hesitancy Scale scores are associated with the Vaccine Hesitancy Scale (Shapiro et al., 2018), r=0.47, p 0.001. Alpha Cronbach measures 0.97.

Procedure

This study's samples comprised 313 people, 148 men and 165 females, selected according to inclusion and exclusion criteria. Informed consent was acquired from every responder. The responses were collected from Indian citizens, mainly from India, who took second or booster doses of Covaxin and Covidshield. The researchers employed purposive sampling, a non-probability sampling method, to carefully select participants from a specific population segment that was easily accessible and deemed relevant to the study. This approach allowed for a deliberate selection of individuals who met specific criteria or characteristics of the research objectives.

Furthermore, the study incorporated a comparative analysis to explore the relationship between gender and vaccination dose. By examining these factors, the researchers aimed to gain a deeper understanding of how different groups within the population responded to the vaccination process. This comparative approach provided valuable insights into potential variations and trends based on gender and the specific dose of the vaccine received.

By utilizing purposive sampling and conducting a comparative study, the researchers aimed to ensure a comprehensive analysis of the data, enabling a more nuanced exploration of the research questions at hand. They are given three questionnaires concerning vaccine hesitancy, prosocial behaviour, and risk-taking, along with a permission form and socio-demographic information. The participants were administered the scale using Google Forms.

Ethical Guidelines

Informed consent was obtained from the participants. Also, a brief idea about the questionnaire was provided, which informed the subject that the details were always kept highly

confidential and would only be used for academic purposes. During the test, the subject was always free to quit the study. The subject was not at all pressured to fill out the questionnaire.

Data Analysis

Upon collecting data via online Google Sheets, individual scores for vaccine hesitancy, prosocial behaviour, and risk-taking behaviour were obtained. Statistical analysis was performed using Microsoft Excel and SPSS. The initial step involved data sorting and exclusion of participants who did not meet the inclusion criteria, ensuring the authenticity of the data for the study. To assess normality, the Kolmogorov-Smirnov and Shapiro-Wilk tests were employed, and nonparametric tests were chosen for subsequent data analysis based on the nature of the obtained data. The utilization of nonparametric tests was warranted as the significance level of all three scales was below 0.05, as ascertained during the assessment.

The data analysis methodology consisted of two sections. The first section aimed to determine the reliability of each test, while the second section focused on providing descriptive statistics to elucidate the selected variables. The relationship between variables was examined using Spearman correlation analysis, taking into account the results of the normality tests. Additionally, the association between two groups (i.e., second dose vs booster dose and male vs female) was assessed using the Mann-Whitney U test. Furthermore, relevant statistical tests, such as regression analyses, were conducted as deemed necessary.

Result and Discussion

This section delves into the analysis and interpretation of the results derived from the dataset. It involves a comprehensive examination of the outcomes to uncover underlying patterns, trends, and relationships. The data is meticulously dissected, allowing for a thorough discussion and in-depth interpretation of the findings. The aim is to extract meaningful insights and draw robust conclusions that pay to the existing frame of knowledge in the field of study.

Sample description

The sample used in this study is those who took various vaccine doses for COVID-19. The type of vaccines analyzed in this study is Covidshield and Covaxin. People from both male and female age categories between 18-40 were selected for the study. Table 4.1 illustrates the population distribution according to gender (Male, Fe-Male).

Table 4.1

Description of the participants based on gender

Gender	Frequency	Percent
Female	165	52.7
Male	148	47.3
Total	313	100.0

Table 4.1 shows the socio-demographic data sheet corresponding to gender. The total included 313 respondents, of which 165 were female, and 148 were male.

Table 4.2 is there to show the mean and standard deviation of sample for each scale (Risk Taking, Prosocialness, and Vaccine Hesitancy). This data can be used for further analysis.

Table 4.2

The Mean and standard deviation for Risk Taking, Prosocialness, and Vaccine Hesitancy

Variable	Mean	Std. Deviation
Risk Taking Total	8.24	3.653
Prosocialness Total	60.41	10.837
Vaccine Hesitancy Total	14.33	5.646

Table 4.2 demonstrates the mean and standard deviation for Risk Taking, Prosocialness, and Vaccine Hesitancy. The standard deviation recorded for Prosocialness is 10.837, slightly higher than other scales. The max score that can obtain on the pro-socialness scale is 80.

In order to evaluate the data distribution, it was first processed in SPSS. The Shapiro-Wilk normality test was directed to determine whether the data followed a parametric or non-parametric distribution. Assessing the normality of the acquired data is essential for conducting statistical tests and determining if the data conforms to a normal distribution. Table 4.3 provides an overview of the analytical techniques employed in this study, including the Kolmogorov-Smirnov and Shapiro-Wilk tests.

Table 4.3

Kolmogorov-Smirnov and Shapiro-Wilk test for normality testing of variables

Tests of Normality						
	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	df	Sig.
Total RT-18	.083	313	.000	.985	313	.003
PSA- 16 (Total)	.064	313	.003	.975	313	.000
OVHS - 7 (TOTAL)	.108	313	.000	.947	313	.000
a. Lilliefors Significance Correction						

The results of the Kolmogorov-Smirnov and Shapiro-Wilk tests for normality, presented in Table 4.3, were conducted using SPSS v25.0. The findings reveal that none of the variables demonstrate a p-value greater than 0.05 ($p < 0.05$), indicating that the variables are not normally distributed. Consequently, non-parametric tests, including Spearman's rank correlation and Mann-Whitney U, were employed for hypothesis testing.

Reliability of the scales

The reliability of the valuating instrument (questionnaire) used in this study was evaluated using the Cronbach Alpha test in SPSS. This test is commonly employed to assess the internal consistency or reliability of a scale, particularly when Likert scale statements are utilized. The outcomes of the Cronbach Alpha test, as shown in Table 4.4, indicate the reliability of the three scales employed in the investigation.

Table 4.4

Results of the reliability analysis of the Risk Taking- 18 scale, Prosocialness Scale for Adults –

scale and Oxford COVID-19 Vaccine Hesitancy Scale.

Scale	Cronbach's Alpha	No. of items
RT-18	.743	18
Prosocialness Scale for Adults	.913	16
Oxford COVID-19 Vaccine Hesitancy	.883	7

Table 4.4 shows that the RT-18 scale has a coefficient alpha (Cronbach's alpha) of α =0.743 (n=18), and the Prosocialness Scale for Adults Scale has Cronbach's alpha α = 0.913, (n=16). Oxford COVID-19 Vaccine Hesitancy scale has a coefficient alpha (Cronbach's alpha) of α=.883 (n=7).

Results of the hypothesis testing are given below:

H1. There is a relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccine.

Table 4.5 presents the outcomes of the analysis that examined the relationship between vaccine hesitancy and risk-taking behavior among adults who received different vaccine doses. The correlation between these two variables was determined using the Spearman rank correlation method, which is a non-parametric test. This statistical test assesses the magnitude and direction of the relationship between the variables and determines the statistical significance of this association.

Table 4.5

The Spearman rank correlation between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccine.

	Risk-taking	RT- group 1 Second dose	RT-Booster dose
Vaccine Hesitancy	-.121*	-0.089	-0.209
Sig. (2-tailed)	0.032	0.149	0.145
N	313	263	50

Table 4.5 shows the correlation between Vaccine hesitancy and risk-taking behaviour levels. The table shows a negative relationship between vaccine hesitancy and risk-taking behaviour at 0.05 level. When Risk-taking increases, vaccine hesitancy decreases. Therefore, H1 is accepted. But when looking separately, there is no significant relationship between vaccine hesitancy and various doses. In that case, the hypothesis is rejected.

Table 4.6 provides an insightful analysis of the relationship between vaccine hesitancy and prosocial behavior among adults who have received different vaccine doses. The correlation between these variables was examined using the Spearman rank correlation, a widely used non-parametric statistical test. This test is particularly suited for situations where the variables are measured on ordinal or ranked scales, as it assesses the strength and significance of the association between the two variables. The Spearman rank correlation analysis aimed to determine the degree of association between vaccine hesitancy and prosocial behavior, shedding light on whether there is a positive or negative relationship between these factors. Additionally,

the analysis explored whether this relationship is statistically significant, indicating the likelihood of it occurring by chance.

By employing the Spearman rank correlation, researchers sought to delve beyond simple associations and uncover any underlying patterns or trends between vaccine hesitancy and prosocial behavior. This approach accounts for the ranking or ordering of the data rather than relying solely on the numerical values. Consequently, it offers a more comprehensive understanding of the relationship and its significance in the context of vaccine doses and adults' attitudes and behaviors.

The findings from Table 4.6 provide valuable insights into the interplay between vaccine hesitancy and prosocial behavior among adults who have received different vaccine doses. They contribute to our understanding of the complex dynamics influencing individuals' decisions and actions related to vaccination, guiding future research and public health interventions.

H2. There is a relationship between vaccine Hesitancy and prosocialness behaviour among adults who took various doses of vaccine.

Table 4.6

The Spearman rank correlation between vaccine hesitancy and prosocialness behaviour among adults who took various vaccine doses.

	Prosocialness Behaviour	Prosocialness Behaviour Second dose	Prosocialness Behaviour -Booster dose
Vaccine Hesitancy	-0.099	-.141[*]	0.129

Sig. (2-tailed)	0.08	0.022	0.372
N	313	263	50

Table 4.6 shows the correlation between Vaccine hesitancy and levels of Prosocialness Behaviour. The result indicates that there is no relationship between vaccine hesitancy and prosocialness. Therefore, Hypothesis H2 is rejected. Interestingly, we observed a negative correlation between vaccine hesitancy and the administration of the first dose of the vaccine. This suggests that individuals who were hesitant initially became less hesitant after receiving the first dose. However, our analysis did not find any significant relationship between vaccine hesitancy and the booster dose, indicating that hesitancy levels did not change significantly after the administration of the booster dose.

Regression analysis is a powerful mathematical technique that helps us identify the factors that truly matter and have an impact. It allows us to answer critical questions such as: Which variables are the most influential? Which ones can be ignored? How do these variables interact with each other? Moreover, it enables us to assess the level of certainty associated with each variable. In regression analysis, these variables are commonly referred to as "predictors." We also have the dependent variable, which is the main factor we are investigating or seeking to understand. By utilizing regression analysis, we gain valuable insights into the relationships and significance of these variables. The regression analysis results, as presented in Table 4.7, display the predicted outcomes based on the variables of risk-taking behavior, prosocialness, and age. The analysis provides valuable insights into the relationships between these factors and their impact on the study's outcome.

Table 4.7

Result of regression analysis predicted by risk taking behaviour, prosocialness and age by the dependent variable Vaccine Hesitancy.

Independent Variable	Dependent Variable	A	SE	B	T	p
Risk taking	Vaccine Hesitancy	-.174	.089	-.113	-1.969	0.50
Prosocialness		-.025	.030	-.047	-.828	.409
Age		.053	.059	.050	.888	.375
Adjusted R^2				0.011		
F				2.123		
P				0.097		

Table 4.7 shows that regression is not significant because when we look p value, it is not less than 0.05, so regression is not significant. Adjusted R^2 is used to find how much variation there is since its 0.011; only one percentage variation is made by the independent variable on the dependent variable. Therefore, regression is not significant. Therefore, this model is not fit.

The prosocialness behaviour scales mean rank and sum of ranks will give the basic idea of the sample with the help of Table 4.8. Also, table 4.9 helps to find the relationship between prosocial behavior among adults who took various doses of vaccine. It will help to find if there is any significant relation.

H3. There is a relationship between prosocialness behaviour among adults who took various doses of vaccine.

Table 4.8

Table 4.8 compares the mean rank and sum of ranks of the Prosocialness scale.

	Vaccine Dose	N	Mean Rank	Sum of Ranks
			Ranks	
PSA- 16 (Total)	Second Dose	263	157.78	41495.00
	Booster Dose	50	152.92	7646.00
	Total	313		
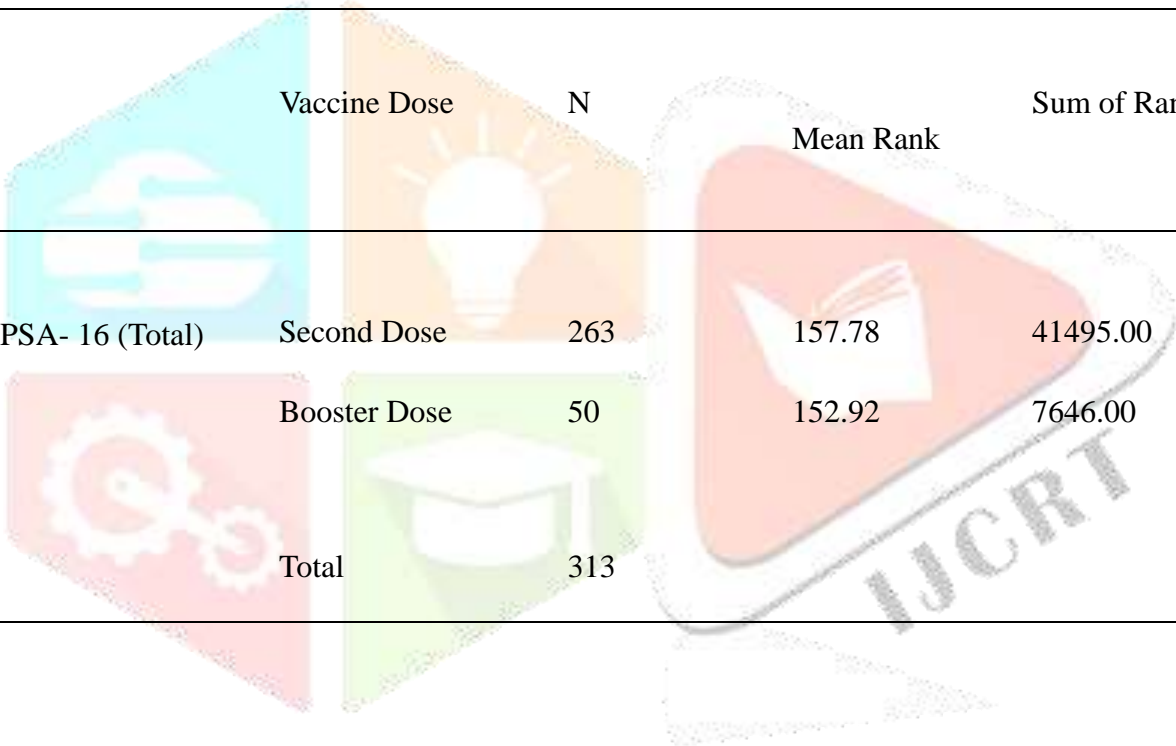
Table 4.9

Table 4.9 shows relationship between Prosocial behavior among adults who took various doses of vaccine.

	Prosocialness
Mann-Whitney U	6371.000
Wilcoxon W	7646.000
Z	-.348
Asymp. Sig (2-tailed)	.728

There is no significant relationship between Prosocial behavior among adults who took various doses of vaccine. Since there is no relationship, hypothesis H3 is reject

The vaccine hesitancy, prosocialness, and Risk-taking scales compares the mean rank and sum of ranks will give the basic idea of the sample with the help of table 4.10. Also, table 4.11 helps to find the relationship between vaccine hesitancy, prosocialness and risk taking between the genders.

H4. There is difference in the relationship between vaccine hesitancy, prosocialness and Risk taking between the genders.

Table 4.10

Table 4.10 compares the mean rank and sum of ranks of vaccine hesitancy, prosocialness and Risk taking between the genders.

	Gender	N	Mean Rank	Sum of Ranks
			Ranks	
Risk Taking	Female	165	142.12	223450.00
	Male	148	173.59	25691.00
	Total	313		
Prosocialness	Female	165	166.58	27485.50
	Male	148	146.32	21655.50
	Total	313		
Vaccine Hesitancy	Female	165	159.57	26328.50
	Male	148	154.14	22812.50
	Total	313		

Table 4.11

Table 4.11 shows the relationship between vaccine hesitancy, prosocialness and Risk taking between the genders.

	Risk Taking	Prosocialness	Vaccine hesitancy
Mann-Whitney U	9755.000	10629.500	11786.500
Wilcoxon W	23450.000	21655.500	22812.500
Z	-.3081	-1.978	-.531
Asymp. Sig (2-tailed)	.002	.048	.596

According to Table 4.11, There is no significant relationship between vaccine hesitancy among genders. Because the p-value is more significant than 0.05. Therefore, the hypothesis is rejected. But there is a partial acceptance of the hypothesis since risk taking and prosocialness value among adults is less than 0.05, which is significant.

Discussion

The primary focus of this study was to investigate the relationship between vaccine hesitancy, risk-taking behavior, and pro-social behavior among adults who have received different doses of the vaccine. By examining these factors, we aimed to gain a better understanding of how people's beliefs and actions are influenced when it comes to getting vaccinated. This study includes 313 samples where 148 males and 165 females. Most of them come from the age category of 19 to 23, even though or sample category is from the age group

18 to 40. The lees data came from the age between 30 to 40. The data was collected using the purposive sampling method. The primary criteria used for data collection are people who took second and booster doses of Covidshield or Covaccine. Each participant who met the inclusion criteria received a consent form and four questionnaires using google forms. Statistical tests, including the Kolmogorov-Smirnov and Shapiro-Wilk tests, were employed to examine the distribution of the data, revealing that it does not follow a normal distribution.

The reliability of three scales, the Oxford COVID-19 Vaccine Hesitancy Scale, Risk-Taking -18 and Prosocialness Scale for Adults, was tested and found to have good reliability in the collected sample.

During the COVID-19 pandemic, various factors such as risk-taking, vaccine hesitancy, and prosocialness play a role in shaping individuals' choices. Personal circumstances influence these factors and may vary from person to person. For instance, individuals who are more inclined to take risks may have been more willing to receive the vaccine in the early stages of its availability.

In an attempt to expedite the development of a COVID-19 vaccine, some researchers have proposed a unique approach known as a human challenge vaccination trial. In this type of trial, healthy volunteers are deliberately exposed to the disease-causing organism after receiving an experimental vaccine. The main objective is to assess the vaccine's effectiveness in a controlled environment. One potential advantage of this approach is that it requires a smaller number of participants compared to traditional vaccine trials. By considering these factors and exploring innovative approaches like human challenge vaccination trials, scientists aim to advance the development of effective vaccines against COVID-19. (*Coronavirus Disease (COVID-19): Vaccine Research and Development*, 2021).

Even though researchers found different types of vaccines, people were confused about the side effects that may happen along with this. COVID-19 vaccinations have provided us with a glimmer of hope to combat the devastating epidemic of COVID-19 and preserve lives. Numerous governments have authorised the emergency use of many vaccines. After COVID-19 immunisation, a wide variety of neurological problems are recorded post-authorization. Neurological adverse events following immunization can vary in their nature and severity. While most of these events are minor and temporary, Rare instances have been observed where more severe neurological consequences, including symptoms such as fever, chills, headache, fever, myalgia, arthralgia, and local injection site reactions like redness, swelling, or discomfort, have been reported.

One such severe consequence is thrombosis of the cerebral venous sinuses, which refers to the formation of blood clots in the veins that drain blood from the brain. This particular neurological complication has been predominantly documented in females of reproductive age who have received vaccines utilizing adenovector technology. Another notable neurological effect associated with immunization, particularly mRNA vaccines, is Bell's palsy. Although rare, Bell's palsy is characterized by temporary facial muscle weakness or paralysis on one side of the face. While the exact cause of Bell's palsy following vaccination is still being investigated, it is worth mentioning as a significant neurological consequence.

Apart from these documented effects, there have been reports of unforeseen neurological adverse reactions occurring after vaccination. These encompass conditions such as acute transverse myelitis, which involves inflammation of the spinal cord, acute disseminated encephalomyelitis, characterized by inflammation in the brain and spinal cord; and acute demyelinating polyneuropathy, which affects the peripheral nerves. These conditions are thought

to be linked to a phenomenon known as molecular mimicry. It is also worth noting that there have been instances of reactivation of herpes zoster (shingles) following vaccination with mRNA vaccines. This occurrence has been reported in some individuals, although it is still being studied to understand the underlying mechanisms.

Importantly, while these neurological adverse events exist, it is crucial to emphasize that their occurrence is exceedingly rare when compared to the large number of individuals who have received COVID-19 vaccinations. The advantages of immunization in preventing COVID-19 and its related complications are significantly greater than the potential risks posed by these uncommon neurological occurrences.

To further investigate and establish a definitive causal relationship between vaccines and neurological adverse effects resulting from immunization, extensive and prospective collaborative investigations are necessary. These studies should prioritize the meticulous surveillance and examination of data to guarantee the safety and effectiveness of vaccines within the population. (Garg & Paliwal, 2021).

The current pandemic has widened the gap between individuals affected by the sickness and those who are not. Understanding how people provide support and assistance to COVID-19 patients during such outbreaks is crucial. The study aims to qualitatively examine the intentions and forms of prosocial behavior exhibited by individuals from low socioeconomic backgrounds in collectivistic communities in India and Indonesia towards COVID-19 victims. Semi-structured and in-depth interviews were conducted via phone and in-person with a sample of 50 respondents (total n = 50) during the lockdown period from March to May 2020. The collected data were analyzed using a qualitative synthesis approach, leading to the identification of five themes: 1) feeling too afraid to offer assistance, 2) a moral dilemma of wanting to help but also

experiencing fear, 3) relying on knowledgeable authorities to manage the situation, 4) demonstrating love, sharing, and support from a distance, and 5) being willing to help at the expense of one's own health. The study highlights a range of prosocial intentions towards COVID-19 victims, spanning from small acts of kindness to acts that may exceed boundaries or even endanger oneself. (Shukla et al., 2022).

Descriptive statistics were employed to ascertain the sample size, including the number of male and female participants in the study. Additionally, the mean value and standard deviation were presented to provide a concise overview of the sample characteristics and the measurement tool utilized.

The first hypothesis states that "there is a relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccine". Since both scales were not normally distributed, Spearman's tests for correlation were used. From the test, we can conclude that There is a negative relationship between vaccine hesitancy and risk-taking behaviour at 0.05 level. When risk-taking increases, vaccine hesitancy decreases. Therefore, the null hypothesis is accepted "There is a relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccine". But there is no significant relationship between vaccine hesitancy and various doses. Therefore, the Hypothesis was rejected when considering specific doses of vaccine.

A study found that COVID-19 vaccination reluctance was lowest among individuals who read newspapers (42%) and highest among television viewers (72%) and social media users (73%). Similarly, the incidence of COVID-19 vaccination resistance was lowest among newspaper readers (37%) and highest among social media users (87%). The multivariate analysis revealed that individuals who relied on radio, television, and social media for pandemic-related

information were less likely to have vaccine hesitancy. On the other hand, social media users, television viewers, and those who relied on healthcare workers and friends/family for COVID-19 information were more likely to resist taking the COVID vaccines. Interestingly, individuals who relied on newspapers for information were less likely to reject the vaccinations compared to those who did not read newspapers (Osuagwu et al., 2023).

The second hypothesis postulates, "There is a relationship between vaccine Hesitancy and pro-social behaviour among adults who took various doses of vaccine ". There is no relationship between vaccine hesitancy and pro-social behaviour. The hypothesis is rejected. But taken individually, there is a negative relationship between vaccine hesitancy and the first dose of vaccine. In that case, the Hypothesis is acceptable. But there is no significant relationship between vaccine hesitancy and the booster dose where the hypothesis was rejected. Since there is a negative relationship for the first dose, we can't entirely leave the possibility that when vaccine hesitancy increases, prosocialness behaviour gets decreases.

A study conducted a cross-sectional survey using Qualtrics to gather data from 500 Irish residents and 577 British residents. The participants completed a questionnaire that included variables related to health, attitudes/beliefs, influence, behavioral intentions, and demographic information. The findings indicated comparable rates of vaccination inclination between the two samples, with approximately 76.8% of Irish participants and 73.7% of British participants expressing their readiness to receive the vaccine if advised by the government. Around 23.2% of Irish respondents and 26.3% of British respondents exhibited some level of vaccine hesitancy or resistance. Univariate analysis demonstrated that gender and age exerted an influence on vaccination intention, with younger females demonstrating higher levels of vaccine hesitance. In a multivariate analysis, factors such as peer influence, physician influence, civic duty, perceived

advantages, and positive attitudes towards vaccination emerged as significant predictors of vaccine uptake. Individuals who expressed vaccine resistance or reluctance generally held less favorable views about vaccination and perceived a higher risk associated with it. (Walsh et al., 2022).

The result of regression analysis predicted by Risk-taking behaviour, Prosocialness and Age state that regression is not significant because when we look p value, it is not less than 0.05, so regression is not significant. Adjusted R^2 is used to find how much variation there is since its 0.011; only one percentage variation is made by the independent variable on a dependent variable. Therefore, regression is not significant. Therefore, this model is not fit.

Regression analysis is a reliable method used to assess the impact of various factors on a specific topic of interest. By employing regression analysis, researchers can effectively identify the significance of different variables, determine which factors are influential, and understand how these factors interact with each other. This technique enables researchers to make accurate decisions regarding the importance of specific factors and ascertain which factors can be disregarded in relation to the topic being studied. (Jordan, 2021).

The third hypothesis postulates that "there is a relationship between prosocialness behaviour among adults who took various doses of vaccine". But the results show that "There is no significant relationship between Prosocial behavior among adults who took various doses of vaccine". Since there is no relationship, the null hypothesis H3 is rejected. Studies show that Vaccination against infectious illnesses such as seasonal influenza, measles, and COVID-19 has private and public advantages. To guide vaccination efforts for such diseases, they explored if social preferences—concerns for the well-being of others—influence a person's decision towards vaccination. These social inclinations are measured for 549 online participants: Each participant

receives $4 to play a game for the public good and contribute to the common good. To the degree that immunisation is obtained because of concern for the health of others, participation in this game is equivalent to an individual's decision to receive the vaccine. They infer the need for a COVID-19 vaccine based on the delay in vaccination initiation. They gather COVID-19 vaccination history independently to prevent experimenter-demand effects. The outcome is impressive: Participation in the good public game is connected with an immense need to obtain a first dose voluntarily and, thus, earlier vaccination.

A person who donates the maximum amount ($4) is 48% more likely than one who provides nothing to acquire their first medication willingly throughout the four-month research period (April through August 2021). Moreover, those with greater prosociality are more likely to receive a COVID-19 immunisation voluntarily. Thus, they urge more studies on applying pro-social preferences to encourage vaccination against communicable illnesses like influenza and HPV (Reddinger et al., 2022).

Hypothesis H4 states that "There is difference in the relationship between vaccine hesitancy, prosocialness and Risk taking between the genders". But result findings say that "there is no significant relationship between vaccine hesitancy among genders". As the p-value exceeds the significance level of 0.05, the null hypothesis is rejected. However, there is partial acceptance of the hypothesis since the significance level for risk-taking and prosocialness among adults is below 0.05, indicating statistical significance.

Adolescents' risk-taking habits might negatively influence several aspects of their health. This study aimed to discover gender-based variations in risk-taking behaviours among Muslim high school students. The rate of risk-taking behaviours was lower among female students than male students, and this gap was more pronounced than in Western nations. This disparity appears

more pronounced when the religious rule of conduct, such as extramarital intimacy, is more stringent (Bahramnejad et al., 2020). It is generally accepted across disciplines that women are more risk-averse than males. Women have a greater understanding of risk and engage in less risky conduct than males. There are examples of this in the economic realm (Azmat & Petrongolo, 2014). Different studies give further insight since COVID-19 is a particular case; more studies are essential to people's attitudes towards risk-taking.

Research findings reveal that women tend to exhibit greater levels of charitable behavior compared to men. Scientists have discovered that the brains of females and males perceive altruistic and selfish actions differently. Specifically, women's reward systems demonstrate heightened responsiveness to prosocial behavior, indicating a stronger positive reaction. On the other hand, men's reward systems exhibit stronger activation in response to selfish behavior, suggesting a preference for self-oriented actions. (The Female Brain Reacts More Strongly to Prosocial Behavior Than the Male Brain, Study Finds, 2017). According to the findings of a study by Isah Aliyu Abdullahi and Dr Pardeep Kumar T, males and girls are nearly equivalent in the majority of prosocial behaviour aspects. Yet, regarding perspective-taking and mutual care, females score higher, indicating that they are more aware of others' emotional states and are more concerned with societal morality (I. Abdullahi & Kumar, 2016).

For the subjective question No of the times you were affected by COVID-19? 76percentage of them were involved one time. Even six people got affected three times.

When looking at the intensity of COVID-19 affected people, 76 percentage affected in a "non-severe manner."

When looking at the other issues that people faced, most said that they were having difficulty breathing, Changes in their menstrual period and sleep pattern, body pain, hair loss and fatigue. But more detailed longitudinal studies are essential to come to the conclusion how all COVID-19 affected other people's life physiologically and psychologically.

Chapter V

Summary and Conclusion

In the 21st century, various challenges, such as natural disasters, wars, and pandemics, have affected people's lives. Among these, COVID-19 stands out as the most significant pandemic. Despite extensive research, the origin of the SARS-CoV-2 virus remains inconclusive. The pandemic has caused widespread medical, financial, social, and psychological issues. Moreover, people's attitudes and behaviors have undergone significant changes during this time.

Although vaccines have been developed, vaccine hesitancy arises due to concerns about unknown side effects. However, some individuals choose to get vaccinated out of a sense of prosocial responsibility, considering the well-being of their family members and others in their vicinity. Early studies indicate a strong connection between vaccination, risk-taking behavior, and prosocial activity during the COVID-19 pandemic.

Research Question

1. Whether there is a relationship between vaccine hesitancy, risk-taking behaviour and pro-social behaviour among adults after taking different doses of vaccine?

Objectives

1. To study the relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccine.

2. To study the relationship between vaccine hesitancy and pro-social behaviour among adults who took various doses of vaccine.

3. To study the relationship between prosocial and risk-taking behaviour among adults who took various doses of vaccine.

4. To study the relationship between vaccine hesitancy, prosocial behaviour and risk-taking between the genders.

Hypothesis

1. There is a relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccine.

2. There is a relationship between vaccine hesitancy and pro-social behaviour among adults who took various doses of vaccine.

3. There is a relationship between pro-social and risk-taking behaviour among adults who took various doses of vaccine.

4. There is difference in the relationship between vaccine hesitancy, pro-social behaviour and risk-taking between the genders.

Sample and Sampling

A total of 313 adults, consisting of 148 males and 165 females within the age range of 18 to 40, participated in the study (n=313). The participants were selected using purposive sampling, which involved deliberately handpicking individuals who met specific inclusion and exclusion criteria. All participants in the study had received either the second dose or the booster dose of Covaxin and Covidshield, ensuring that they fulfilled the predetermined requirements for inclusion in the research.

Tools

The following tools were used to assess risk-taking behaviour, prosocial behaviour, and vaccine hesitancy among adults who took the second and the booster dose of the covid-19 vaccine.

1. **Informed Consent Form**.
   The informed consent form provides a voluntary willingness to participate in the study. Before participating, the participant is provided with facts about the research goal and its potential risk.

2. **Socio-demographic Data Sheet**.
   After agreeing to participate in the study willingly, they filled in the socio-demographic details. The researcher prepared a socio-demographic sheet, including facts like age, gender, religion, residence, vaccine name, vaccine dose, and whether affected with COVID-19 or not (if yes, its severity mild, moderate, severe).

3. **RT - 18** (de Haan et al., 2011)
   The RT-18 questionnaire comprises 18 statements that are answered with either a yes or no response. These statements are divided into two subscales, each containing nine questions: risk-taking and risk assessment. A high score on the risk-taking subscale suggests a high degree of an

individual's actual risk-taking behaviour. In contrast, a high score on the risk assessment subscale implies little or no consideration of potential repercussions.

4. **Prosocialness Scale for Adults (PSA)** (Caprara et al., 2005)

The Prosocialness Scale for Adults is a measurement tool designed to evaluate an individual's engagement in prosocial behaviors. It encompasses a set of sixteen items that collectively assess various aspects of prosocial conduct. Each item prompts participants to indicate the frequency or extent to which a specific prosocial statement accurately describes their behavior.

To quantify their responses, participants utilize a five-point Likert scale, offering a range of options to capture the degree of agreement or endorsement. The scale includes response choices such as "never/nearly never true" (coded as 1), indicating rare occurrence or minimal agreement with the statement, and "almost always/always true" (coded as 5), representing a consistent demonstration of the prosocial behavior described in the statement.

5. **Oxford COVID-19 Vaccine Hesitancy Scale**(Freeman et al., 2020)

This scale comprises seven items and was used in a study involving 5,114 individuals from the UK. The participants were selected in a manner that ensured proportional representation across various demographic factors such as age, gender, ethnicity, income, and area. The answer choices for each item are assigned codes ranging from 1 to 5. It is important to note that there is an additional response option labeled "Don't know," which does not contribute to the overall score calculation.

The scores obtained from the Oxford COVID-19 Vaccine Hesitancy Scale are positively correlated with the scores from the Vaccine Hesitancy Scale developed by Shapiro et al. in 2018 ($r = 0.47$, $p < 0.001$). This indicates that the two scales capture similar constructs related to vaccine hesitancy. Additionally, the internal consistency of the Oxford COVID-19 Vaccine Hesitancy Scale, as measured by Cronbach's alpha, is exceptionally high at 0.97. This suggests a high level of reliability and internal consistency in the scale's items.

Data Analysis

Data collection was conducted by utilizing online Google Sheets, where each participant's scores for vaccine hesitancy, prosocial behavior, and risk-taking behavior were individually measured. Subsequently, statistical analysis was performed using Microsoft Excel and SPSS software. The initial step in the analysis involved organizing the data and excluding any entries that did not meet the predetermined criteria for inclusion in the study. Only authentic data that adhered to the specified criteria were considered for analysis. To determine the normality of the data, the Kolmogorov-Smirnov and Shapiro-Wilk tests were employed. Based on the nature of the obtained data, nonparametric tests were used for further data analysis. This

decision was made because the significance level of all three scales was found to be below 0.05 during the examination.

In summary, the study employed online Google Sheets for data collection, followed by data sorting and exclusion of non-compliant entries. Statistical analysis involved utilizing software such as Microsoft Excel and SPSS. Nonparametric tests were chosen based on the characteristics of the collected data, as confirmed by the significance levels of the scales.

The data analysis was divided into two sections. The first section focused on assessing the reliability of each test employed in the study. This step aimed to determine the consistency and stability of the measurement tools used.

In the second section, descriptive statistics were utilized to provide information about the selected variables under investigation. The correlation between these variables was examined using the Spearman correlation coefficient, taking into account the normality results obtained from the data.

Furthermore, the study assessed the relationship between two groups: the second dose group versus the booster dose group, as well as the male group versus the female group. The Mann-Whitney U test was utilized to examine whether there were any significant distinctions between these groups. Furthermore, other suitable statistical analyses, including regression analyses, were performed, when necessary, in accordance with the research goals.

Major Findings

1. There is a negative relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccines.

2. There is no significant relationship between vaccine hesitancy and various doses of vaccines.

3. There is no relationship between vaccine hesitancy and prosocialness who took various vaccine doses.

4. There is a negative relationship between vaccine hesitancy and the first dose of vaccine.

5. There is no significant relationship between Prosocial behavior among adults who took various doses of vaccine.

6. There is no significant relationship between vaccine hesitancy among genders.

7. There is a significant relationship between risk taking and prosocialness among genders.

Implications of the study

1. Generalizability through larger sample size: In order to make broader conclusions, it is essential to conduct a more comprehensive study encompassing a larger and more diverse sample size. This expanded research approach is necessary to ensure that the findings can be applied and generalized to a wider population. Since COVID-19 vaccines have various advantages and disadvantages, relying solely on data from a single vaccine may not accurately represent people's attitudes. By incorporating data from multiple vaccines and considering vaccination rates and their impacts, we can obtain a more comprehensive and generalized result.

2. Gender differences in prosocial behavior: The study highlights that prosocial behavior tends to be more prevalent among women compared to men. However, a more detailed analysis is needed to draw such conclusions, which can be achieved by examining additional real-life situations and incorporating diverse factors.

3. Future outbreak preparedness: This study can serve as a valuable resource when preparing for future outbreaks of new viruses. By understanding people's attitudes towards vaccination, we can anticipate and address potential challenges in vaccine acceptance, public perception, and overall response to new outbreaks.

4. Importance of education and awareness: The study emphasizes the necessity of an effective educational system to provide awareness among the population on various essential topics. By providing individuals with precise and reliable information, encouraging the development of analytical thinking skills, and nurturing their ability to critically evaluate media sources, we can contribute to mitigating the dissemination of inaccurate or deceptive information. This, in turn, promotes the cultivation of an enlightened and knowledgeable society.

5. Public health interventions and messaging approaches: The study's findings underscore the importance of developing effective public health policies and communication strategies. Understanding people's

attitudes towards vaccination can aid in tailoring messaging and interventions to address specific concerns and misconceptions, ultimately promoting vaccine acceptance and public health outcomes.

6. Vaccine hesitancy and addressing misinformation: The study highlights the existence of vaccine hesitancy and the spread of misinformation. This calls for targeted efforts to combat misinformation through accurate and accessible information campaigns, fact-checking initiatives, and transparent communication from trusted sources. Addressing vaccine hesitancy is crucial to achieving higher vaccination rates and mitigating the impact of infectious diseases.

7. Policy implications for equitable access: The study sheds light on the attitudes and behaviors related to vaccination. These insights can inform policy decisions and interventions aimed at ensuring equitable access to vaccines. By identifying and addressing barriers to vaccination, policymakers can work towards reducing disparities and ensuring that vulnerable populations have equal access to the benefits of vaccination.

8. Long-term impacts on public health: The implications of the study extend beyond the immediate context of COVID-19. Understanding people's attitudes towards vaccines can provide insights into long-term public health challenges and inform strategies for promoting preventive measures in the face of future infectious diseases.

9. Collaborative efforts for vaccine acceptance: The study emphasizes the need for collaborative efforts among healthcare professionals, policymakers, researchers, and communities to promote vaccine acceptance. By fostering partnerships and engaging with community leaders, organizations, and influencers, we can collectively work towards building trust, addressing concerns, and encouraging vaccination uptake.

Limitations of the study

Any interpretation or generalization of the present findings should consider some possible limitations of the study.

1. Possible factors such as socioeconomic status, religion and faith level were not considered for analysis.

2. The reason for not taking the booster dose was not collecteed, which would have added to the richness of the data and more accurate interpretations.

3. The sample size was small when considering the topic.

4. The number of people who took the booster dose was also less compared to those who took the second dose.

Recommendations for Future Research

This study is basically conducted on the Indian population and people who took prescribed vaccines. So, variation might happen in the results depending on the type of vaccine, so same study cannot be conducted in another country if the vaccine and its doses are different. Also, here in India, no of people who took booster doses is so less, so it is very up important to collect data from people who took booster dose. Nice people become used to it; currently, they are not giving much importance in this field so as a result there is a chance to conduct another research in such a manner that how people would react if a new variant or a new viral infection spreads off.

Conclusions

The study aims to find the relationship between vaccine hesitancy, risk-taking behaviour and pro-social behaviour among adults after taking different doses of vaccine. The study concluded a negative relationship between vaccine hesitancy and risk-taking behaviour among adults who took various doses of vaccines. Also, the study implies no significant relationship between vaccine hesitancy and multiple doses of vaccines. The findings indicate that there is no correlation between vaccine hesitancy and the level of prosocial behavior exhibited by individuals who have received different doses of the vaccine. However, when specifically examining the first dose of the vaccine, there appears to be a negative association with vaccine hesitancy, suggesting that individuals who are hesitant about getting vaccinated may be more inclined to hesitate specifically when it comes to receiving the initial dose.

Furthermore, the study reveals that there is no statistically significant relationship between the level of prosocial behavior displayed by adults and the different vaccine doses they have received. This implies that the extent to which individuals engage in prosocial acts does not appear to be influenced by their vaccination status.

Additionally, the research findings indicate that there is no notable correlation between vaccine hesitancy and gender. In other words, the level of hesitancy towards vaccines does not significantly differ between genders.

However, the study does identify a significant relationship between risk-taking behavior and prosocialness when considering gender. This suggests that there is a notable association between the propensity to take risks and engaging in prosocial acts, but this relationship is specifically observed within the context of gender.

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Appendix- I

This is a study conducted by Goodwin Solly under the guidance of Professor Dr. Jessy Fenn from Rajagiri College of Social Sciences. This study is conducted on people in the age range of 18-40. This Google form consists of around 61 questions in 5 different sections. Please take your time to answer the questions honestly. This study will be kept confidential except in cases where the researcher is legally obligated to report specific incidents. Your help will be deeply appreciated.

Informed consent form

The purpose of the study is to gather information on whether there is a relationship between vaccine hesitancy, risk-taking behaviour and pro-social behaviour among adults after taking different doses of vaccine. I understand that the researcher will not identify me by name in any reports using information obtained from this research and that my confidentiality as a participant in this study will remain secure. Subsequent uses of records and data will be subject to standard data use policies that protect individuals' and institutions' anonymity. I have read and understand the explanation provided to me. I volunteered to participate in the research study conducted by Goodwin Solly under the guidance of Dr. Jessy Fenn from Rajagiri College of Social Sciences, Kalamassery.

By signing this consent form, I confirm that I have read and understood the information and have had the opportunity to ask questions. I know that my participation is voluntary and that I can withdraw at any time without giving a reason or without cost. I voluntarily agree to take part in this study.

Signature: _____   Date: _____

Appendix- II

Socio-demographic datasheet

1. Age

2. Gender: Male/ Female/ Prefer not to say

3. Educational Qualification:

4. Religion: Hindhu/ Christian/ Muslim/ Buddhism/ Other/ Prefer not to say

5. Occupation: Student/ Employee

6. Country of Living: India/ Out of India

7. Geographic: Urban/ Semi Urban/ Rural/ Semi-Rural

8. Vaccine Name: Covidshield/Covaxin

9. Vaccine Dose: Second/ Booster

10. Have you contracted COVID-19? : Yes/No

COVID-19 Impact

I. No of the times you were affected by COVID-19? – 0,1,2,3,

II. If "Yes", how would you classify its intensity?

1) NON-SEVERE COVID-19 (Absence of any criteria for severe or critical COVID-19.)

2) SEVERE COVID-19 (Defined by any of ∘Oxygen saturation < 90% on room air; ∘in adults, signs of severe respiratory distress (accessory muscle use, inability to complete whole sentences, respiratory rate > 30 breaths per minute), and, in children, very severe chest wall indrawing, grunting, central cyanosis, or presence of any other general danger signs (inability to breastfeed or drink, lethargy or reduced level of consciousness, convulsions) in addition to the signs of pneumonia.)

3) CRITICAL COVID-19 (Defined by the criteria for acute respiratory distress syndrome (ARDS), sepsis, septic shock, or other conditions that would normally require the provision of life-sustaining therapies such as mechanical ventilation (invasive or non-invasive) or vasopressor therapy.)

Appendix- III

Risk Taking- 18, Please select Yes/ No

1. Do you often get into a jam because you do things without thinking?	Yes	No
2. Do you usually think carefully before doing anything?	Yes	No
3. Do you mostly speak before thinking things out?	Yes	No
4. Do you enjoy taking risks?	Yes	No
5. Would you enjoy parachute jumping?	Yes	No
6. Do you welcome new and exciting experiences and sensations, even if they are a little frightening and unconventional?	Yes	No
7. I often try new things just for fun or thrills, even if most people think it is a waste of time	Yes	No
8. I often spend money until I run out of cash or get into debt from using too much credit	Yes	No
9. I like to think about things for a long time before I make a decision	Yes	No
10. I usually think about all the facts in detail before I make a decision	Yes	No
11. I enjoy saving money more than spending it on entertainment or thrills	Yes	No
12. I often follow my instincts, hunches, or intuition without thinking through all the details	Yes	No
13. I often do things on impulse	Yes	No
14. I enjoy getting into new situations where you can't predict how things will turn out	Yes	No
15. I sometimes like to do things that are a little frightening	Yes	No
16. I sometimes do "crazy" things just for fun	Yes	No
17. I prefer friends who are excitingly unpredictable	Yes	No
18. I like "wild" uninhibited parties	Yes	No

Appendix IV

How to score the RT-18:

RT-18 items	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Yes	1	0	1	1	1	1	1	1	0	0	0	1	1	1	1	1	1	1
No	0	1	0	0	0	0	0	0	1	1	1	0	0	0	0	0	0	0
Total score	Add up all points obtained from 18 items (see table above, note items 2, 9, 10 and 11 are reversed)																	
Factor 1 score	"Risk Taking Behavior" Add up points obtained from items 4, 5, 6, 7, and 14, 15, 16, 17, and 18																	
Factor 2 score	"Risk Assessment" Add up point obtained from items 1, 2, 3 and 8, 9, 10, 11, 12, and 13																	

Appendix- V

Oxford Covid-19 Vaccine Hesitancy Scale (Freeman et al, 2020)

These questions ask how you would respond if there was an approved COVID-19 vaccine for the NHS.	
1. Would you take a COVID-19 vaccine (approved for use in the UK) if offered?	☐ Definitely ☐ Probably ☐ I may or I may not ☐ Probably not ☐ Definitely not ☐ Don't know
2. If there is a COVID-19 vaccine available:	☐ I will want to get it as soon as possible ☐ I will take it when offered ☐ I'm not sure what I will do ☐ I will put off (delay) getting it ☐ I will refuse to get it ☐ Don't know
3. I would describe my attitude towards receiving a COVID-19 vaccine as:	☐ Very keen ☐ Pretty positive ☐ Neutral ☐ Quite uneasy ☐ Against it ☐ Don't know
4. If a COVID-19 vaccine was available at my local pharmacy, I would:	☐ Get it as soon as possible ☐ Get it when I have time ☐ Delay getting it ☐ Avoid getting it for as long as possible ☐ Never get it ☐ Don't know
5. If my family or friends were thinking of getting a COVID-19 vaccination, I would:	☐ Strongly encourage them ☐ Encourage them ☐ Not say anything to them about it ☐ Ask them to delay getting the vaccination ☐ Suggest that they do not get the vaccination ☐ Don't know
6. I would describe myself as:	☐ Eager to get a COVID-19 vaccine ☐ Willing to get the COVID-19 vaccine ☐ Not bothered about getting the COVID-19 vaccine ☐ Unwilling to get the COVID-19 vaccine ☐ Anti-vaccination for COVID-19 ☐ Don't know
7. Taking a COVID-19 vaccination is:	☐ Really important ☐ Important ☐ Neither important nor unimportant ☐ Unimportant ☐ Really unimportant ☐ Don't know

Appendix- VI

Scoring sheet

Oxford Covid-19 Vaccine Hesitancy Scale (Freeman et al, 2020)

This is a seven-item measure, derived from a study with 5,114 UK adults, quota sampled to match the population for age, gender, ethnicity, income, and region. Item specific response options, coded from 1 to 5, are used. A 'Don't know' option is also provided, which is excluded from scoring. Higher scores indicate a higher level of vaccine hesitancy. The Oxford COVID-19 Vaccine Hesitancy Scale scores are associated with the Vaccine Hesitancy Scale (Shapiro et al, 2018), r=0.47, p< 0.001. The Cronbach's alpha is 0.97. Full details of the questionnaire development can be found in the supplementary materials of the paper.

Reference: Freeman, D., Loe, B.S., Chadwick, A., Vaccari, C., Waite, F., Rosebrock, L., Jenner, L., Petit, A., Lewandowsky, S., Vanderslott, S., Innocenti, S., Larkin, M., Giubilini, A., Yu, L-M., McShane, H., Pollard, A.J., & Lambe, S. (2020). COVID-19 vaccine hesitancy in the UK: The Oxford Coronavirus Explanations, Attitudes, and Narratives Survey (OCEAN) II. Psychological Medicine. https://doi.org/10.1017/S0033291720005188

Appendix- VII

Prosocialness Scale for Adults (PSA)

The following statements describe a large number of common situations. There are no right or wrong answers; the best answer is the immediate, spontaneous one. Read each phrase carefully and fill in the number that reflects your first reaction.

1	2	3	4	5
Never/Almost Never	Rarely	Occasionally	Often	Always/Almost Always

1. I am pleased to help my friends/colleagues in their activities.   1 2 3 4 5

2. I share the things that I have with my friends.   1 2 3 4 5

3. I try to help others.   1 2 3 4 5

4. I am available for volunteer activities to help those who are in need.   1 2 3 4 5

5. I am empathic with those who are in need.   1 2 3 4 5

6. I help immediately those who are in need.   1 2 3 4 5

7. I do what I can to help others avoid getting into trouble.   1 2 3 4 5

8. I intensely feel what others feel   1 2 3 4 5

9. I am willing to make my knowledge and abilities available to others   1 2 3 4 5

10. I try to console those who are sad.   1 2 3 4 5

11. I easily lend money or other things   1 2 3 4 5

12. I easily put myself in the shoes of those who are in discomfort   1 2 3 4 5

13. I try to be close to and take care of those who are in need   1 2 3 4 5

14. I easily share with friends any good opportunity that comes to me   1 2 3 4 5

15. I spend time with those friends who feel lonely   1 2 3 4 5

16. I immediately sense my friends' discomfort even   1 2 3 4 5
    when it is not directly communicated to me.

Appendix- VIII

Scale Consent

Gianvittorio Caprara <gianvittorio.caprara@uniroma1.it>
To: Goodwin Solly <msy521@rajagiri.edu>

Dear Goodwin Solly,

I am glad to accord my permission to use the prosocialness scale and I enclose two papers that can be of your interest.
Sincerely, GVCaprara

[Quoted text hidden]

**Fai crescere le giovani ricercatrici e i giovani ricercatori
con il 5 per mille alla Sapienza**
Scrivi il codice fiscale dell'Università **80209930587**
Cinque per mille

---

2 attachments

📄 **CAPRARA_Adults' Prosocialness.pdf**
330K

📄 **Prosociality scale in Frontiers.pdf**
895K

Appendix- IX

Scale Consent

Daniel Freeman <daniel.freeman@psych.ox.ac.uk>
To: Goodwin Solly <msy521@rajagiri.edu>

Dear Goodwin

Thank you for your email. You are very welcome to use the scale. Good luck with your research and studies.

With kind regards, Daniel

From: Goodwin Solly <msy521@rajagiri.edu>
Sent: 05 August 2022 18:31
To: Daniel Freeman <daniel.freeman@psych.ox.ac.uk>
Subject: Scale Consent

[Quoted text hidden]

Oxford Covid Vaccine Hesitancy Scale.docx
27K

Appendix- X

Consent

Verster, J.C. (Joris) <J.C.Verster@uu.nl>
To: Goodwin Solly <msy521@rajagiri.edu>

Dear Goodwin,

Permission granted to use the RT-18. – please cite the article by De Haan (see attached) when you publish your data. Also attached the scoring instructions.

Good luck with your research,

Joris

From: Goodwin Solly <msy521@rajagiri.edu>
Sent: Thursday, September 15, 2022 4:36 PM
To: Verster, J.C. (Joris) <J.C.Verster@uu.nl>
Subject: Consent

You don't often get email from msy521@rajagiri.edu. Learn why this is important

[Quoted text hidden]

2 attachments

deHaan2011 RT18.pdf
471K

RT-18 English with instructions - updated version june 2018.docx
20K

Appendix- XI

Risk-taking Behaviour, Prosocial Behaviour, and Vaccine Hesitancy among adults who took the second and the booster dose of the COVID-19 Vaccine

by Goodwin Solly

Submission date: 29-May-2023 10:04AM (UTC+0530)
Submission ID: 2104270743
File name: Goodwin_Solly_Plagarism_check.docx (116.07K)
Word count: 16392
Character count: 97667

Appendix- XII

Acknowledgement

Conflict of Interest

The author(s) declared no conflict of interest.