

Overcoming COVID-19: Delaying Gratification, Preventive Practices, Risk of Testing Positive and Mental Health during the Pandemic

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In order to adhere to COVID-19 regulations individuals need to exert self-control and delay gratification by immediate rewards such as attending social events and roaming without masks. The objective of the present study was to understand the association between delaying gratification, preventive practices, risk of testing positive and mental health during the pandemic and to examine if delaying gratification predicts the other variables. A correlational research design was employed for the study. Data was collected from 214 participants from Mumbai region and tools used were Delay of Gratification Inventory (DGI-10), the General Health Questionnaire-12 (GHQ-12), and Prevention Practices against COVID-19 Questionnaire. The results show Delaying Gratification to be a predictor of adherence to preventive practices and mental health during the pandemic. Delaying Gratification was positively correlated to adherence to preventive practices and negatively correlated to mental distress during the pandemic. Findings have implications for understanding role and importance of delaying gratification in affecting outcomes during a pandemic and interventions that can be undertaken to improve the outcomes..

Keywords: Delaying gratification, Mental health, Preventive practices, Risk of testing positive, Pandemic

Delaying gratification requires one to postpone immediate gratification in order to attain delayed but more valued outcomes/rewards (Mischel et al., 1989). This ability to delay gratification is an important component of self-control. Walter Mischel pioneered research in this field with his famous “Marshmallow Experiment” (Mischel & Ebbesen, 1970). It was found that 4-year-old kids who delayed gratification longer in certain laboratory situations developed into more socially and cognitively competent adolescents, could cope with stress better and had higher SAT scores (Mischel et al., 1989). Later studies have found that poor delay of gratification is linked to substance abuse, obesity, risky sexual behaviour and psychopathology (Baumeister, Vohs, & Tice., 2007; Bobova et al., 2009). Although earlier studies conceptualize delaying gratification as a stable trait, later evidence suggests that it can be learnt and enhanced using different strategies (Mischel, 1974; Mischel & Feldman, 1996).

A situation where delaying gratification became necessity was when the COVID-19 pandemic hit. Governments world-wide had to shut down the borders and impose restrictions on movement, along came rules to wear masks and maintain social distancing. Individuals suddenly found themselves unable to meet friends, families, attend social events, dine outside, even ordering non-essential products online was restricted in some places. Adhering to all these rules and following prescribed preventive practices can be seen as a situation where individuals were required to choose between larger long-term reward of protection against COVID-19 and smaller immediate reward of breaking rules and attending social events, not wearing masks, etc. Therefore, it is possible that individual differences in following preventive practices, and their risk of getting infected depends on their ability to delay gratification. In this study we'll be examining the relationship between these variables and test if individual's

ability to delay gratification can predict the extent to which they adhere to preventive practices and whether they're at risk of testing positive or not.

Researchers have already found that another similar construct, delay discounting, is related to preventive practices followed by individuals (Byrne et al., 2021), it was found to partially mediate link between behaviour related to COVID-19 and stress (DeAngelis, Salah, & al'Absi, 2021), and as more time passes, they're less compliant with containment measures (Nese et al., 2020). Delay discounting is the phenomenon where the value of a reward decreases with time, making individuals choose smaller immediate reward over a reward they'd receive later in time (Green et al., 1994). Byrne et al. (2021) found that greater amount of delay discounting predicted less adherence to preventive practices. Delay discounting and delaying gratification are usually believed to be measuring same underlying construct, but some evidence suggests they're not equivalent (Reynolds & Schiffbauer, 2005; Göllner et al., 2018). A study found them to be strongly negatively correlated, one of the reasons for negative correlation could be that delay discounting tasks usually involve cool processes (cognitive/strategic system) that allow individuals to exert more self-control, whereas delay of gratification tasks involve hot processes (affective/motivational system) which makes it harder to exert self-control (Göllner et al., 2018). The literature on whether delaying gratification or delay discounting predicts behaviour in this pandemic is lacking. We decided to pick delay of gratification as predictor variable in this study. This would allow to examine if delaying gratification can also predict variables predicted with delay discounting measures.

Another variable that's been known to be correlated to delaying gratification is mental health. Individuals suffering from externalizing disorders show deficits in ability to delay gratification (Krueger et al., 1996), those suffering from eating disorders such as bulimia and binge eating disorders have been shown to have lower delay of gratification scores (Bartholdy et al., 2017), low scores on delaying gratification was associated with higher reports of anxiety, depression symptoms (Paiva et al.,

2019). The present study also examines if it's possible to predict mental health with delay of gratification scores. Paiva et al. (2019) found delaying gratification to be negatively correlated to mental health, but regression model found that other components of self-control were predictors of mental health and not delaying gratification. The present study is an attempt to extend these findings to Indian population in times of COVID, and evaluate if delaying gratification can predict mental health during the pandemic. Understanding the relationship between these variables would help in predicting and possibly preventing who're at risk of infection and mental distress and implement strategies to improve the outcomes. In past delay of gratification has been found to be affected socio demographic variables, a conceptual replication of Mischel's study showed that when controlled for family backgrounds and cognitive abilities the correlation between delaying gratification and future outcomes was greatly reduced (Watts, Duncan, & Quan, 2018). In the present study data was also collected on annual family income to examine and control the effect of annual income on study variables.

The objectives of the present study were to understand the association between delaying gratification, preventive practices, risk of testing positive and mental health during the pandemic and to examine if delaying gratification predicts the other variables. The hypotheses of the study are: 1. There is an association between Delaying gratification, adherence to preventive practices, testing positive for COVID and mental health, 2. Delaying gratification predicts adherence to preventive practices, testing positive for COVID and mental health.

Method

The present study employs a Correlational Research Design, which involves observing two or more variables to understand and assess the statistical relationship between them.

Study Sample

Random sampling technique was used to collect data on individuals in Mumbai region falling the age group of 18–25-year-old. The survey used for data collection was created

using Google forms. 214 responses were collected. The survey also included a section for informed consent where it was informed that all their data would remain confidential and used only for research purposes. The data collected from 214 participants was analyzed using appropriate descriptive and inferential statistics.

All statistical analyses were performed using R-4.1.2 (a free, open-source software for statistical analysis) in R-studio IDE.

Measures

Delaying Gratification Inventory (DGI-10)- For measuring delaying gratification ability, the Delaying Gratification Inventory (DGI-10) was used (Hoerger, Quirk, & weed, 2011). This scale contains 10 items that measure individual's ability to delay gratification in five domains- food, physical pleasures, social interactions, money, and individual achievements. The items are rated on a 5-point Likert-type scale (1=strongly disagree, 5=strongly agree). The higher the total score, the better is the ability to delay gratification.

Preventive Practices Questionnaire- For measuring adherence to preventive practices, the Preventive practices against COVID-19 questionnaire was used (Agarwal et al., 2021). It contains 19 items, rated on a 5-point Likert-type scale, that measures the extent to which individuals follow preventive practices. It includes items such as: "How often do you wear masks while going out of home?", "How often do you maintain a minimum distance of 1 m at your workplace?". A higher score indicates a greater adherence to preventive practices against COVID-19.

Tested positive- A single dichotomous item was included in the survey to measure if the individuals had ever tested positive for COVID-19. The question was "Have you ever tested positive for COVID-19?". Participants could answer by selecting either "Yes" (score=1) or "NO" (score=0).

General Health Questionnaire (GHQ-12)- For measuring Mental Health the General Health Questionnaire (GHQ-12) was used (Goldberg and Williams, 1988). It contains 12-items rated on a 4-Point Likert type scale. Scores can range

from 0 to 36. Higher scores indicate worse mental health condition.

Annual Income- Participants were asked to indicate their annual family income by selecting one of the three options provided: "less than 2.5 lakhs", "2.5-7 lakhs", "above 7 lakhs" which were converted to a score of 1, 2, 3 respectively to make measure income on ordinal scale.

Results

Descriptive statistics is provided in Table 1 and Table 2

Table 1: Demographic Information

Gender	n
Female	179
Male	33
Other	2
Age	
18-25	214
Tested Positive for COVID-19	
Yes	43
No	171
Annual Income	
Below 2.5 lakhs	96
2.5-7 lakhs	79
Above 7 lakhs	39
Total N	214

Table 2: Mean, Median, Mode for variables in the study

Variable	Mean (SD)	Median	Mode
Delaying Gratification (DGI)	35.6 (4.76)	36	37
Adhering to Preventive Practices (Preventive practices questionnaire)	73.32 (10.58)	75	75
Tested Positive (Yes/No)	-	-	No (79.9%)
Mental Health (GHQ)	15.19 (7.45)	14	9
Annual Income	-	2.5-7 lakhs	<2.5 lakhs

For inferential statistics correlations were computed. Since the variables were not normally distributed, even in absence of outliers, non-parametric correlations were performed. Kendall's Tau was used to measure correlation between delaying gratification and preventive practices, delaying gratification and mental health. Point-biserial correlation was computed between delaying gratification and testing positive. Spearman's rho was used to measure correlation between these variables and annual income.

Table 3: Correlation of delaying gratification and annual income with study variables

Variable	Adherence to Preventive Practices	Tested Positive	Mental Health (GHQ)
Delaying Gratification (DGI)	0.199**	0.097	-0.134**
Annual Income	0.018	0.133	0.097

**Significant correlation at 0.01 level

As shown in the table (Table 3), only two of the correlations were found to be significant. Delaying gratification was found to have a significant weak positive correlation with preventive practices and a significant weak

negative correlation with mental health. As these correlations were significant, Ordinary Least Squares (OLS) regression was performed. The assumptions for OLS were met and the models were significant. The results are shown below (Table 4 & 5).

The R2 value of 0.046 indicates that 4.6% variation in mental health can be explained by delaying gratification. Although only a small portion of variance is explained by the model, it was found to be statistically significant (p<0.01). The model significantly predicts the outcome variable mental health, for every unit increase in delaying gratification the GHQ scores decrease by 0.34, i.e. mental health improves (lower scores on GHQ indicate better mental health) with increasing scores on delaying gratification.

The R2 value of 0.085 indicates that 8.5% variation in adherence to preventive practices can be explained by delaying gratification. Although only a small portion of variance is explained by the model, it was found to be statistically significant (p<0.01). The model significantly predicts the outcome variable preventive practices, for every unit increase in delaying gratification the preventive practices scores increase by 0.65, i.e. adherence to preventive practices increases with increasing scores on delaying gratification.

Table 4: Regression analysis of Delaying Gratification (DGI) predicting mental health (GHQ)

	B	95% CI [LL, UL]	Beta	t	p
constant	27.19**	19.75, 34.62		7.209	<0.01
Delaying Gratification	-0.34**	-0.54, -0.13	-0.22	-3.209	<0.01

R²= 0.046 (N= 214, p<0.01, CI= confidence interval for B, LL, UL indicates upper limit and lower limit respectively)

Table 5: Regression analysis of Delaying Gratification (DGI) predicting adherence to preventive practices

	B	95% CI [LL, UL]	beta	t	p
constant	50.29**	39.95, 60.63		9.585	<0.01
Delaying Gratification	0.65**	0.36, 0.93	0.29	4.429	<0.01

R²= 0.085 (N= 214, p<0.01, CI= confidence interval for B, LL, UL indicates upper limit and lower limit respectively)

Discussion

The study aimed to examine how delaying gratification was associated with adherence to COVID-19 preventive practices, testing positive for COVID-19 and mental health during the pandemic. It was hypothesized that there is an association between the variables such that delaying gratification predicts adherence to preventive practices, testing positive and mental health during the pandemic. The results partly support the hypotheses, as delaying gratification had significant associations with and predicted two of the variables: adherence to preventive practices and mental health, but did not significantly predict testing positive for COVID-19.

The ability to delay gratification allows one to wait for larger more valuable rewards without being distracted by immediate rewards. This ability, being an important aspect of self-control, is required whenever there's a need to persist through unpleasant circumstances in order to achieve the desired goals/ rewards. As the COVID-19 regulations imposed many restrictions on movement, gatherings, etc. individuals were required to choose between immediate gratification through social events, avoiding uncomfortable masks, not following the rules, etc. and the delayed gratification of staying safe and not contracting the coronavirus disease.

Before any vaccines were developed, preventive practices such as using sanitizers, wearing masks, avoiding shaking hands, not leaving home unnecessarily were prescribed by the World Health Organization and local authorities around the world in order to protect against the virus. The results of the present study support the hypothesis that adherence to such preventive practices can be predicted by individuals' ability to delay gratification. The higher the ability to delay gratification, the greater is the adherence to preventive practices. This is in line with findings from other studies showing association between the ability to delay rewards and preventive practices during COVID-19 (Byrne et al., 2021; DeAngelis, Salah, & al'Absi, 2021; Xu & Cheng, 2021). This finding, like much of the past research, highlights the importance

of interventions that focus on strengthening the ability to delay gratification, which the research suggests can be improved (Mischel, 1974). A population with higher ability to delay gratification would take more precautions and stay safer during such pandemics, ultimately reducing some of the burden on healthcare system and reducing the losses due to reckless behaviour.

The present study, however, failed to find significant association between testing positive for COVID-19 and delaying gratification. The rationale behind trying to find association between these variables was that individuals higher in ability to delay gratification would take enough precautionary measures and therefore less frequently test positive for COVID-19. Perhaps, other factors such as number of cases in the area, number of people staying in the house and their adherence to preventive practices could instead be responsible for an individual testing positive, even when those individuals delay gratification and take precautionary measures.

The results of the present study also found significant association between delaying gratification and mental health. The results support the hypothesis that delaying gratification predicts mental health during the pandemic. Individuals higher in the ability to delay gratification would have better mental health (lower scores on GHQ). This finding adds to literature on association between delaying gratification and mental health (Krueger et al., 1996; Bartholdy et al., 2017; Paiva et al., 2019). The ability to delay gratification allows one to focus on the long-term goals by resisting immediate rewards and makes it easier to organise their lives in pursuit of those goals. This organised lifestyle and sense of purpose through the pursuit of goals perhaps acts as a protective factor against mental distress.

This study extends the findings on association between these variables for an Indian population. India being the second most highly populated country in the world, with increasing number of individuals diagnosed with mental health disorders, early interventions and programs introduced at schools that target development of skills and abilities such as

delaying gratification could prove useful. The present study also couldn't find significant association between annual income and study variables, hence annual income couldn't account for the variation in variables in the present study.

Conclusion

The study found significant associations between delaying gratification, adherence to preventive practices against COVID-19, and mental health during the pandemic. The results partly support the hypotheses as delaying gratification significantly predicts adherence to preventive practices and mental health, but didn't predict testing positive for COVID-19. The significant relationships are in line with the past research. One of the reasons for not finding association between delaying gratification and testing positive could be that other factors such as number of cases in the area, number of people in the house and their adherence to preventive practices could be influencing who tests positive for COVID-19.

The study has several limitations. As the data was collected through online survey, it was not possible to include measures of other variables like cognitive abilities, and get exhaustive information on family background which could be affecting the variables of the study. Also, the sample size (N=214), all coming from Mumbai region, is not enough to generalize the results to a global population. This can be addressed in future research with larger more diverse samples and taking into account the other extraneous variables that could be influencing the variables in the study. The study used an ordinal measure of income by forming three income groups which showed no significant association with the study variables. Future research could divide income into more groups or measure it on a continuous scale and then examine the associations with other study variables. Future research should also explore different ways in which interventions and programs can be implemented that help individuals improve the ability to delay gratification. Keeping in mind the limitations and results, it can be concluded that delaying gratification predicts adherence to preventive practices and mental health during the pandemic; as ability to delay gratification

increases, adherence to preventive practice increases and mental health improves.

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