

# Impact of Metaverse Applications on Social Anxiety of Teenagers

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## ABSTRACT

Our study aimed to estimate the impact of metaverse applications in teenagers in India using a self-reported survey design. An online survey was conducted to analyze the impact of these applications using the Social Interaction Anxiety Scale. It was found in the study that 43%(43) of the total subjects experienced an increase in social anxiety after playing metaverse applications, 41%(41) experienced a decrease in social anxiety after playing metaverse applications and 16%(16) did not experience any change in the levels social anxiety after playing metaverse applications.

**Keywords:** Metaverse, Social Anxiety, Social Interaction Anxiety Scale

## INTRODUCTION

In today's time, greater rates of social anxiety symptoms and the prevalence of those meeting the mark for Social Anxiety Disorder have been observed among young people, especially those that are aged between 18-24. <sup>(1)</sup> Due to increased exposure of the younger generation to technology we often find adolescents spending hours of their daily lives delving into screens. The use of mobile media in childhood continues to increase. <sup>(2)</sup> This increase in screen time has led to higher reported levels of social anxiety both in males and females. <sup>(3)</sup>

The metaverse is a virtual reality that exists outside of reality. It's a combination of the words "meta" and "verse," which signify "transcendence" and "world," respectively. It is often divided into many types, a few of them being augmented reality, mirror world, and virtual reality. A kind of augmentation of the external environment is augmented reality. It is a type of technology that utilises a location-aware system and interface to

overlay and layer networked information on areas we encounter regularly. It enlarges the real physical world outside of an individual. This included popular games such as Zepeto and Epic Games. A Mirror world essentially broadens the scope of the actual world to transfer it to virtual reality as if reflected in a mirror, for example, Minecraft, Upland, and Digital Lab. Virtual reality simulates the real world and makes a user feel as though they are entirely emersed in another world, this would include applications such as Roblox, Decentraland, Fortnite, and RecRoom. <sup>(4)</sup>

The increased screen time associated with the use of metaverse applications, rapid game development, regular use of this new technology, and the experience of a virtual world without any physical interaction, could have an increasingly negative impact on the social anxiety of teenagers in the future.

## MATERIALS & METHODS

### Sample

The sample comprised a hundred subjects out of which 74% were males and 26% were

females. After informed written consent teenagers between the ages of thirteen to nineteen across various cities of India who played metaverse applications of either Roblox, Decentraland, Epic Games, Minecraft, Fortnite, Zepeto, and RecRoom were taken in the study. The group consisted of subjects from similar educational and socioeconomic backgrounds.

**Instruments**

One measure was used in this study, SAIS (Social Interaction Anxiety Scale): The Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1989) assesses social interactional anxiety, which is defined as intense distress when establishing and sustaining interactions with peers, outsiders, or possible partners. It is comprised of 20 social interaction items that are scored from 0 (not at all characteristic or typical of me) to 4 (highly characteristic or typical of me). Items are self-statements that describe one's representative reaction to situations in which dyads or groups of people interact socially. The SIAS is calculated by adding up the ratings (after reversing the 3 positively worded items). The total score ranges from 0 to 80, with higher numbers indicating more anxiety about social interactions. (6)

**Procedure**

Many students across India were contacted and subjects were selected. An online survey was conducted to analyze the effect of metaverse applications on the social anxiety of teenagers. A questionnaire was created and delivered to the selected participants. The participants had to choose from a list of metaverse along with the time they played and a SAIS (Social Interaction Anxiety Scale) to measure the before and after-effects. This will help us in determining the effects of metaverse applications on the social anxiety of teenagers.

**RESULT**

100 randomly chosen teenagers were selected for this research. All subjects were from India predominantly residing in New Delhi and Dehradun. All the subjects selected had not taken any anxiety medication before, after, or while playing the metaverse applications.

Based on types of metaverse it was found in the study that those who played augmented reality applications either zepeto or epic games or both either separately or among others, constituted 39% (39) of the total subjects out of which 94.87% (37) were males and 5.12% (2) were females. 53.84% (21) of the subjects playing these applications experienced an increase in social anxiety while 38.46% (15) experienced a decrease and 7.69% (3) experienced the same levels. The subjects in the study who played mirror world applications such as Minecraft either separately or among others constituted 66% (66) of the total number of subjects of which 74.4% (49) were males and 25.75(17) were females. 42.42% (28) of the subjects playing mirror world applications experienced an increase in social anxiety while 15.15(10) experienced the same level of social anxiety and 42.42% (28) experienced a decrease in social anxiety. The subjects in the study who played virtual reality applications either Roblox or Decentraland or Fortnite or RecRoom either separately or among others constituted 73% (73) of the total subjects out of which 86.30% (63) were males and 13.69% (10) were females. 46.57% (34) of the subjects playing these applications experienced an increase in social anxiety while 39.72% (29) of the subjects experienced a decrease in the level of social anxiety and 13.69% (10) remained the same.

**Table No. 1 Percentage changes in levels of anxiety after playing Augmented reality,mirror world and virtual reality applications**

Anxiety levels after playing Augmented reality applications			Anxiety levels after playing Mirror world applications			Anxiety levels after playing virtual reality applications		
Increased	Decreased	Same	Increased	Decreased	Same	Increased	Decreased	Same
53.84%	38.46%	7.69%	42.42%	42.42%	15.15%	39.72%	46.57%	13.69%

Based on hours spent playing the metaverse applications it was found that 58%(58) of the total number of subjects played for 1-3 hours weekly out of which 65.51%(38) were male and 34.48%(2) were female. 36.20% (21) of the subjects who played for 1-3 hours weekly experienced an increase in social anxiety, 43.10%(25) experienced a decrease in social anxiety and 20.68%(12) did not experience any change. The subjects in the study who played metaverse applications 3-5 hours weekly were found to be 18%(18) of the total number of subjects of which 88.88%(16) were males and 11.11%(2) were females. 61.11%(11) of the subjects who played for 3-5 hours weekly experienced an increase in social anxiety, 27.77%(5) experienced a decrease in social anxiety and 11.11%(2) did not experience any change. The subjects in

the study who played metaverse applications 5-7 hours weekly were found to be 15% (15) of the total number of subjects of which 93.33%(14) were males and 6.66%(1) were females. 33.33% (5) of the subjects who played for 5-7 hours weekly experienced an increase in social anxiety, 53.33% (8) experienced a decrease in social anxiety and 13.33% (2) did not experience any change. The subjects in the study who played metaverse applications 7-10 hours weekly were found to be 7% (7) of the total number of subjects of which 85.71%(6) were males and 14.28%(1) were females. 71.42%(5) of the subjects who played for 7-10 hours weekly experienced an increase in social anxiety, 28.57%(2) experienced a decrease in social anxiety and 0%(0) did not experience any change.

**Table No. 2 Percentage changes in levels of anxiety after playing metaverse applications for 1-3 hours, 3-5 hours, 5-7 hours and 7-10 hours weekly**

Social Anxiety Levels increased				Social Anxiety Level decreased				Social Anxiety Levels remained the same			
1-3hrs	3-5hrs	5-7hrs	7-10hrs	1-3hrs	3-5hrs	5-7hrs	7-10hrs	1-3hrs	3-5hrs	5-7hrs	7-10hrs
36.20%	61.11%	33.33%	71.42%	43.10%	27.77%	53.33%	28.57%	20.68%	11.11%	13.33%	0%

76%(76) of the subjects, in the study, were male while, 24 % (24) were female. Of the participants in the study, 43%(43) experienced an increase in social anxiety after playing metaverse applications out of which 79.06%(34) were males and 20.93%(9) were females. 41%(41) experienced a decrease in social anxiety after

playing metaverse applications out of which 80.48%(33) were males and 19.51%(8) were females. 16%(16) did not experience any change in their levels of social anxiety after playing metaverse applications out of which 56.25%(9) were males and 43.75%(7) were females.

**Table No. 3 Changes in levels of anxiety after playing metaverse applications**

Social Anxiety Level increased			Social Anxiety level decreased			Social Anxiety level remained the same		
Percentage	Males	Females	Percentage	Males	Females	Percentage	Males	Females
43%	34	9	41%	33	8	16%	9	7

## DISCUSSION

It was found in the study that 43% (43) of the total subjects experienced an increase in social anxiety after playing metaverse applications, 41% (41) experienced a decrease in social anxiety after playing metaverse applications and 16% (16) did not experience any change in the levels social anxiety after playing metaverse applications.

The higher incidence of social anxiety after playing metaverse applications could be attributed to the fact that often teenagers become accustomed to the online format and when placed in situations where they need to be present physically it triggers their anxiety to a greater extent than before. The decrease in social anxiety levels could be seen due to gaining confidence during online

interactions with other players and then in turn channeling this confidence in offline situations thereby leading to a decrease in social anxiety. The reason for which the lowest percentage of people experienced no change in social anxiety levels after playing metaverse applications can be since there is daily exposure for a long duration of time to these applications.

A recent study carried out in 2020 by Boers E, Afzali MH, Conrod P. on Temporal Associations of Screen Time and Anxiety Symptoms Among Adolescents<sup>(5)</sup> concluded that anxiety symptoms may become more severe in a particular year if social media, television, and/or computer use all rise in the same year, which is similar to the result of this study as social anxiety levels here are too seen to increase with exposure to playing metaverse applications. The limitation of the study would be that subjects can misrepresent responses to appear socially acceptable because the measure is self-report. Furthermore, the majority of the scale's items are scored in the same manner, allowing for response bias. This limitation could be overcome by the diagnosis of individuals by mental health experts rather than a self-report format.

## CONCLUSION

It was found that a higher percentage of teenagers reported experiencing an increase in social anxiety after playing metaverse applications. This may be improved if the change in the levels of social anxiety is measured by mental health experts rather than self-report in the future. Further study is required to make more comprehensive and concrete conclusions about the impact of metaverse applications in teenagers.

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