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## How to Prevent Student Mental Health Problems in Metaverse Era?

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# How to Prevent Student Mental Health Problems in Metaverse Era?

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## Abstract

Metaverse, a combination of social media, gaming, and virtual reality technology innovation, is a new concept that has attracted the attention of various groups. This concept has also aided numerous groups of people, including the academician. As Metaverse offers various means to innovate, it is projected to change human lives and patterns of interaction. However, Metaverse also presents a number of negative impacts on mental health, even greater than the impacts of online games. This literature review aims to examine the impacts of the Metaverse on adolescents. Then, it develops the relevant preventive strategy through school guidance and counseling programs. This study is motivated by the lack of research related to the impact of Metaverse on adolescents' mental health and intervention strategies. By applying the PRISMA steps, the study was conducted on scientific articles published from 2017 to 2022 extracted using Publish or Perish software. From the data collection process, we garnered and analyzed 25 relevant articles from ScienceDirect, SpringerLink, Sage Journals, Google Scholar, WoS, ProQuest, Taylor & Francis Group, Emerald Insight, DOAJ, and Garuda. Our analysis results showed that Metaverse potentially has negative impacts on adolescents, especially on non-cognitive aspects, such as social skills, empathy, self-esteem, self-control, and self-regulated learning. In addition, a basic guidance and counseling strategy using various approaches and techniques is required, particularly group guidance using information technology and social media to develop youth literacy about mental health in this metaverse era.

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## 1. Introduction

Following Facebook's rebranding as Meta, Metaverse has gained extensive interest in the research of virtual information and communication field (Aharon, Demir, & Siev, 2022; Prieto, Lacasa, & Martínez-Borda, 2022; Wei, 2022). It is expected to carry a number of superiorities as it integrates social media, games, and 3D virtual space into virtual reality devices, facilitating unlimited-scale real-time communication. Accordingly, the future communication media is deemed to be the second living space for humans (Damar, 2021; Mystakidis, 2022; Sriram & Corp, 2022). Besides, Metaverse is also forecasted to massively alter human living, particularly in the aspects of the economy, health, education, socio-cultural, and even morality values (Damar, 2021; Eglinton & Carter, 2021).

As the result of virtual reality expansion, Metaverse potentially presents positive as well as negative influences (Lee et al., 2021; Narin, 2021). The social media, game, and virtual reality practitioners ensure that Metaverse presents benefits in various sectors (Kye, Han, Kim, Park, & Jo, 2021; Xi, Chen, Gama, Riar, & Hamari, 2022). The term Metaverse was first introduced by Neal Stephenson in his novel entitled *Snow Crash* in 1992. Within that novel, Metaverse is described as the last evolution of the Internet into a virtual world, carrying atrocious effects on human life, specifically on people's mental health and behavior. Those illustrated effects are similar to the effects

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of excessive social media usage and gaming (Brunborg, Mentzoni, & Melkevik, 2013; Damar, 2021; Egliston & Carter, 2021; Logrieco, Marchili, Roversi, & Villani, 2021; Thomason, 2021).

The study on Metaverse, along with the future information and communication technology industry, has been reported since the early 2000s (Collins & Tuque, 2008; Jaynes, Seales, et al., 2003). However, there have been limited studies on Metaverse focusing on education, psychology, guidance, and counseling field. Therefore, this review examines the possible effects of Metaverse on adolescents' mental health, involving the available studies on the impacts of social media and online gaming on adolescents, specifically on cognitive, affective, emotional, and behavioral development. This study is essential as the Metaverse industry development is rapidly progressing, with the majority of them targeting adolescents as their primary users. The results of this study are expected to aid school counselors in comprehending the Metaverse and its effects on adolescents' psychological and behavioral development, as well as being the foundation for constructing preventive measures in anticipating the adolescents' behavioral issues related to the negative influence of the Metaverse.

In detail, this study aims to: (1) analyze the potential usage of Metaverse in the field of education, (2) analyze the effects of Metaverse on adolescent's mental health, and (3) suggest possible preventive guidance and counseling strategy for anticipating adolescents' mental issues in the era of Metaverse. The results of this literature review were expected to serve as a reference for school counselors and other researchers for developing preventive guidance and counseling programs for adolescents in the era of the Metaverse.

## 2. Method

This literature review used several references, in the form of books, scientific articles, and others, as the primary data source. Creswell (2017) specified that a literature review is a study of a collection of scientific articles, books, or other documents to describe a research topic using various different theories. This literature review was carried out following a procedure proposed by Hsieh and Shannon (2005), containing five stages, namely: (1) collection of literature, (2) selection of relevant literature, (3) review of the literature using content analysis focusing on the results and recommendation sections, (4) drawing of review results, and (5) discussion on the review results.

The collection and selection of literature were carried out using the PRISMA model, consisting of three phases, namely (1) identification, (2) screening), and (3) inclusion (Rethlefsen et al., 2021). The literature collection was completed using a number of search engines providing articles with excellent qualities, such as ScienceDirect, SpringerLink, Sage Journals, ProQuest, Taylor & Francis Group, Emerald Insight, and Garuda. In the literature search, we used keywords of Metaverse, adolescents' mental health, psychoeducation, and basic strategy in guidance and counseling programs. The collected literature was published between 2018 to 2022 and written in Indonesian or English. In this literature study, we generated secondary data describing the possible effects of Metaverse on adolescents, along with the potential guidance and counseling preventive strategy. The research method is illustrated in Figure 1.

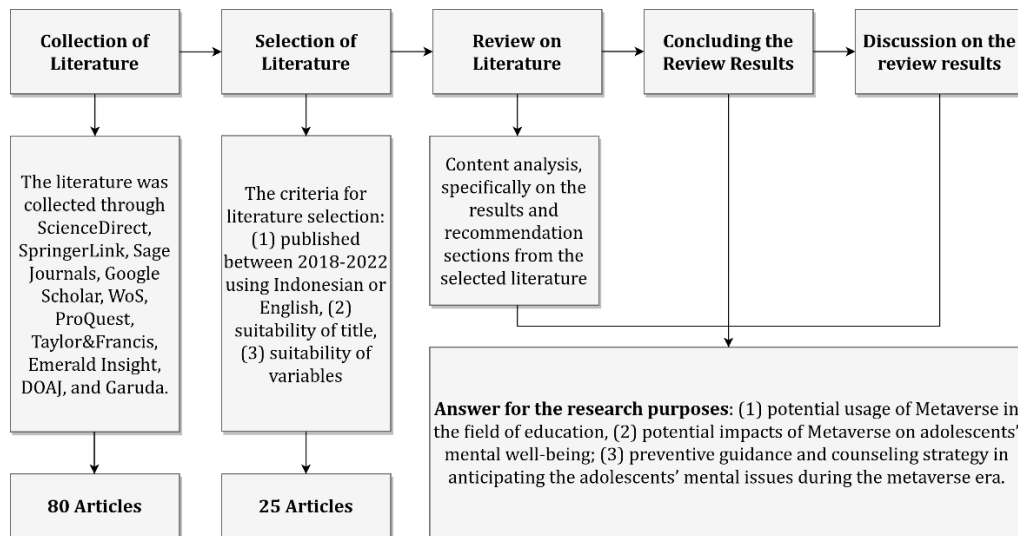


Figure 1. Procedures of Literature Review

### 3. Results

From the literature collection process, we obtained 80 scientific articles. Then, a further review was conducted, resulting in 25 articles relevant to the concepts of Metaverse, adolescents' mental well-being, as well as guidance and counseling preventive strategy. The phases of literature collection and selection are presented in Figure 2.

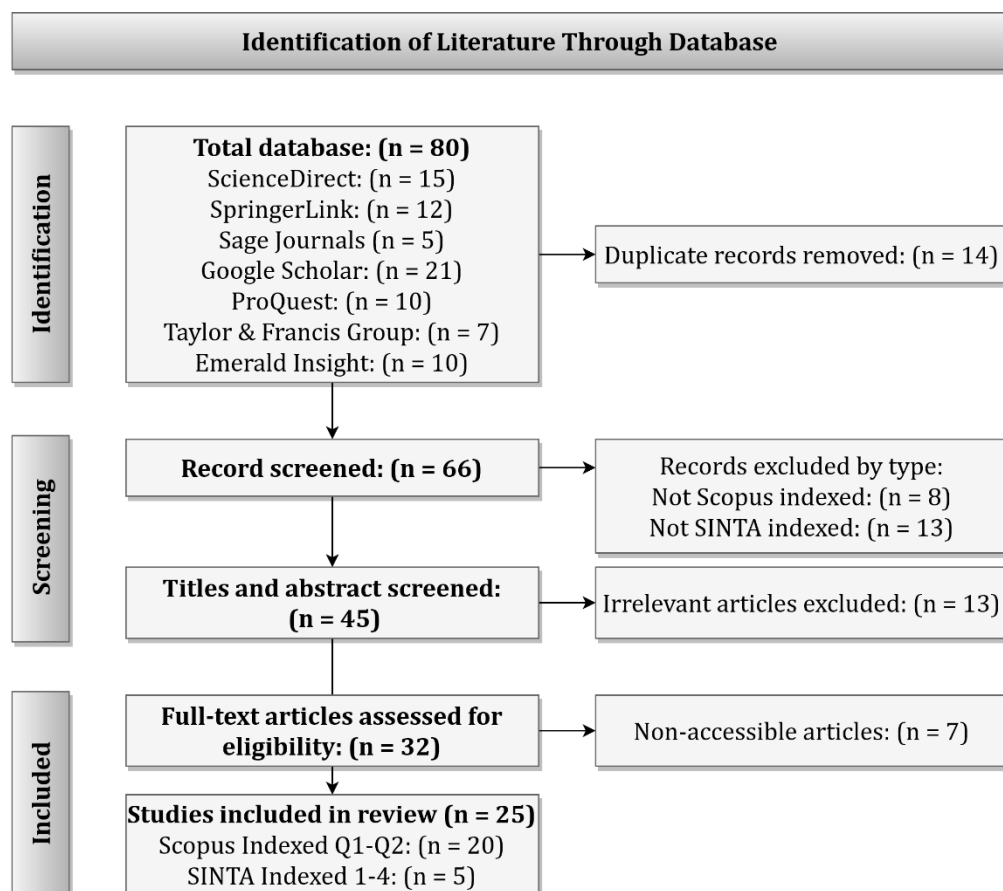


Figure 2. Literature Collection and Selection Process Based on PRISMA

In the next stage, the literature review mainly focused on (1) the potential usage of Metaverse in the education field, (2) the prediction of Metaverse effects on adolescents' mental health, and (3) the guidance and counseling strategy to anticipate the adolescents' mental problems in the Metaverse Era. The results of the review are summarized in Table 1.

**Table 1. Results of Literature Selection**

No	Authors and Publishing Year	Title	Results
1	Garavand & Aslani (2022)	Metaverse phenomenon and its impact on health: A scoping review	Metaverse helps people feel closer to the people living in the distance by constructing a space similar to the authentic space
2	Akour et al. (2022)	A conceptual framework for determining metaverse adoption in higher institutions of gulf area: An empirical study using hybrid SEM-ANN approach	Learners, both school and college students, consistently present growing interest in using Metaverse
3	Dwivedi et al. (2022)	Metaverse beyond the hype: Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice, and policy	Impacts of the Metaverse are: (1) altered social interaction patterns, behavior, and culture; (2) the norms in the real world are not applicable in the Metaverse; (3) addiction to keep accessing the Metaverse; (4) Metaverse assists both positive and negative activities; (5) Metaverse allows rapid information dissemination; (6) Metaverse enables sexual harassment; (7) Metaverse possibly increases bullying cases; and (8) it potentially enables the increase of hate speech, (9) racism, and (10) violent threat
4	Bibri & Allam (2022)	The Metaverse as a Virtual Form of Data-Driven Smart Urbanism: On Post-Pandemic Governance through the Prism of the Logic of Surveillance Capitalism	Metaverse potentially reduces the practice of democratic values and ethics. Along with AI development, human behavior becomes more predictable, while IoT usage may generate a smart city based on data. Besides, individuals are more likely to be individualistic, as they can regulate their own profile in Metaverse.
5	Floridi (2022)	Metaverse: a matter of experience	Metaverse provokes high technology addiction as people have a greater tendency to use the Metaverse platform to get away from their misery through entertainment. Besides, people tend to prefer fantasy in Metaverse to their real life.
6	Cheong (2022)	Avatars in the Metaverse: potential legal issues and remedies	The presence of avatars in Metaverse possibly causes fraud, defamation, identity theft, and crime.
7	Chia (2022)	The Metaverse, but not the way you think: game engines and automation beyond game development	The video games using a 3D ecosystem are fundamental for future Metaverse development.
8	Suh & Ahn (2022)	Utilizing the Metaverse for Learner-Centered Constructivist Education in the Post-Pandemic Era: An Analysis of Elementary School Students	Ninety seven point nine percent of 336 students perceive Metaverse as the inseparable component of their daily life.
9	Usmani et al. (2022)	Future of mental health in the Metaverse	Adolescents tend to spend a significant amount of time playing 3D games and using social media. Consequently, they experience insecurity, anxious, depression, and addiction.
10	Boer et al. (2021)	Social media use intensity, social media use problems, and mental	The effects of social media addiction include reduced academic achievement,

No	Authors and Publishing Year	Title	Results
		health among adolescents: Investigating directionality and mediating processes	lower social interaction skills, increased cyber victimization, and higher social comparison.
11	Gao et al. (2020)	Mental health problems and social media exposure during the COVID-19 outbreak	A total of 4872 participants from 31 provinces experienced anxiety disorders and depression. Thus, the government should pay more significant concern to mental health issues.
12	Hong et al. (2021)	Social media exposure and college students' mental health during the outbreak of CoViD-19: the mediating role of rumination and the moderating role of mindfulness	The 439 adolescents from Wuhan and Hubei reported that negative information from social media induces anxiety and depression in college students during the Covid-19 pandemic.
13	Beeres et al. (2021)	Social media and mental health among early adolescents in Sweden: a longitudinal study with 2-year follow-up (KUPOL study)	In three years, social media usage among teenagers has been rising. The use of social media significantly correlates with adolescents' mental health.
14	Biegun et al. (2019)	Measuring Problem Online Video Gaming and its Association with Problem Gambling and Suspected Motivational, Mental Health, and Behavioral Risk Factors in a Sample of University Students	The problems caused by video games positively correlate with the amount of time spent playing games and social alienation. Meanwhile, the motives for playing video games include competition, getting away from real-life issues, recreation, and socialization.
15	Caner & Evgin (2021)	Digital risks and adolescents: The relationships between digital game addiction, emotional eating, and aggression	Addiction to digital games increases the risk of obesity, stress, and emotional disorders in adolescents.
16	Yang et al. (2021)	Validation of the internet gaming disorder symptoms checklist based on the fifth edition of the diagnostic and statistical manual of mental disorders in Chinese adolescents	Due to playing online games, teenagers face difficulties in time management, experience symptoms of depression, and have suicidal thoughts.
17	Gundogdu & Eroglu (2022)	The relationship between dissociation symptoms, sleep disturbances, problematic internet use, and online gaming in adolescents	Online game addiction is one of the causes of dissociation symptoms
18	Erlisa & Daulay (2022)	The Effectiveness of Group Guidance Services in Minimizing Smartphone Addiction	Group guidance is proven to be effective in minimizing Internet addiction in adolescent
19	Kartikasari & Prasetiawan (2022)	Self-Concept Enhancement through Group Guidance with Sociodrama Techniques for Class X MIPA 1 Student of SMA Sauqi Nusantara	The sociodrama technique in group counseling enhances the self-concept of tenth-grade senior high school students taking Science Majors. In the first cycle, students' self-concept increased from 74.42% to 75.73%. In the second cycle, it grows to 84.09%.
20	Utaminingsih & Lianasari (2022)	Home Room Technique Group Guidance to Improve Student's Confidence	The homeroom technique in group counseling improves students' confidence, with five students having moderate confidence and one student presenting high confidence.
21	Yudhi et al. (2021)	Predicting Video Game Addiction: The Effects of Composite Regulatory Focus and Interpersonal Competence Among Indonesian Teenagers During COVID-19 Pandemic	Involving 136 adolescent, consisting of 86 male and 50 female students, the research suggested that self-regulation and interpersonal communication significantly affects their addiction to video games.
22	Lewoleba et al. (2022)	Development of Instagram social media as a non-toxic application with positive and interactive information	Respondents report that Instagram contents are beneficial and attractive.



No	Authors and Publishing Year	Title	Results
23	Van der Bend et al. (2022)	Adolescents' exposure to and evaluation of food promotions on social media: a multi-method approach	The study involves 35 adolescents and concludes that adolescents prefer using Instagram, Snapchat, and YouTube in their daily activities.
24	Dewanti & Sujarwo (2021)	Development of Instagram and YouTube content videos for online learning	As digital media, Instagram and YouTube present video content that is effective in facilitating online learning for adolescents.
25	Jerasa & Boffone (2021)	BookTok 101: TikTok, Digital Literacies, and Out-of-School Reading Practices	TikTok can be used for developing digital literacy, creativity, ideas, and community skills among adolescents.

As presented in Figure 1, 80% of the obtained literature was published in Q1-Q2 Scopus-indexed journals, while the remaining 20% of them were published in the journals indexed as Sinta 1-4. These garnered articles were published around 2020-2021, showing the rapid growth of Metaverse discussion over the last three years. The primary features of Metaverse mostly aid the education, communication, health, and psychology fields.

## 4. Discussion

### 4.1. Potential Usage of Metaverse in the Educational Field

In the Snow Crash novel, Stephenson illustrates Metaverse as an Internet-based virtual world that enables users to build a digital reality and share their experience through the avatar (Floridi, 2022; Usmani et al., 2022). Garavand and Aslani (2022) added that Metaverse would continuously develop until we have a 3D virtual space that resembles our real life. 3D virtual spaces developed using augmented and virtual reality enables the users to interact with the real environment using avatars and holograms (Chia, 2022; Dwivedi et al., 2022; Suh & Ahn, 2022). As predicted by Bibri and Allam (2022), the potential of the Metaverse keeps expanding since it may serve as an alternative for the future data-based smart city. It is feasible since the data from avatar usage are stored in the system and used as the foundation for artificial intelligence development (Cheong, 2022).

With the recent technological advancement, Metaverse no longer becomes a fantasy (Barrera & Shah, 2023; Buhalis, Leung, & Lin, 2023). The dimensions of Metaverse include online games and virtual reality, which have been adopted massively. A survey conducted by Suh and Ahn (2022) discovered that 97.9% of 336 primary school students in Korea have experience using Metaverse, while 95.5% of them have perceived Metaverse as an integral part of their daily life. Similarly, Akour et al. (2022) also added that Metaverse usage in the education field will constantly grow over time. This increased usage of Metaverse, however, also carries obstacles and hindrances for education territory, although students' future is inseparable from Metaverse (López-belmonte, Pozo-Sánchez, Moreno-Guerrero, & Lampropoulos, 2023). Tlili et al. (2022) added that Metaverse facilitates greater student involvement, stronger learning motivation, and language mastery. Additionally, Metaverse also enhances teacher-student interaction by using the virtual avatar.

Our literature suggested that Metaverse will serve as the future platform for education, with a 3D visual concept that combines augmented reality and virtual reality. In the future, this ecosystem will be indivisible from daily life. Students' fondness of games and social media has illustrated students' dependency on developing technology (Paschke & Thomasius, 2021; Gürbüz et al., 2021; Yayman & Bilgin, 2020). Consequently, It is anticipated that the Metaverse will play a significant role in educational processes.

### 4.2. Predicted Effects of Metaverse on Adolescents' Mental Well-Being

Metaverse is forecasted to carry both positive and negative effects on adolescents' life. During the stage of adolescence, humans face a highly complex development. In this stage, students' cognitive is in the formal operational stage, so they become more critical and self-centered in resolving their life problems (Suryani, 2017; Papalia, et al., 2015; Piaget, 2013). Further, adolescents also have unstable emotions, where they are more susceptible to negative emotions (Purnamingtyas &

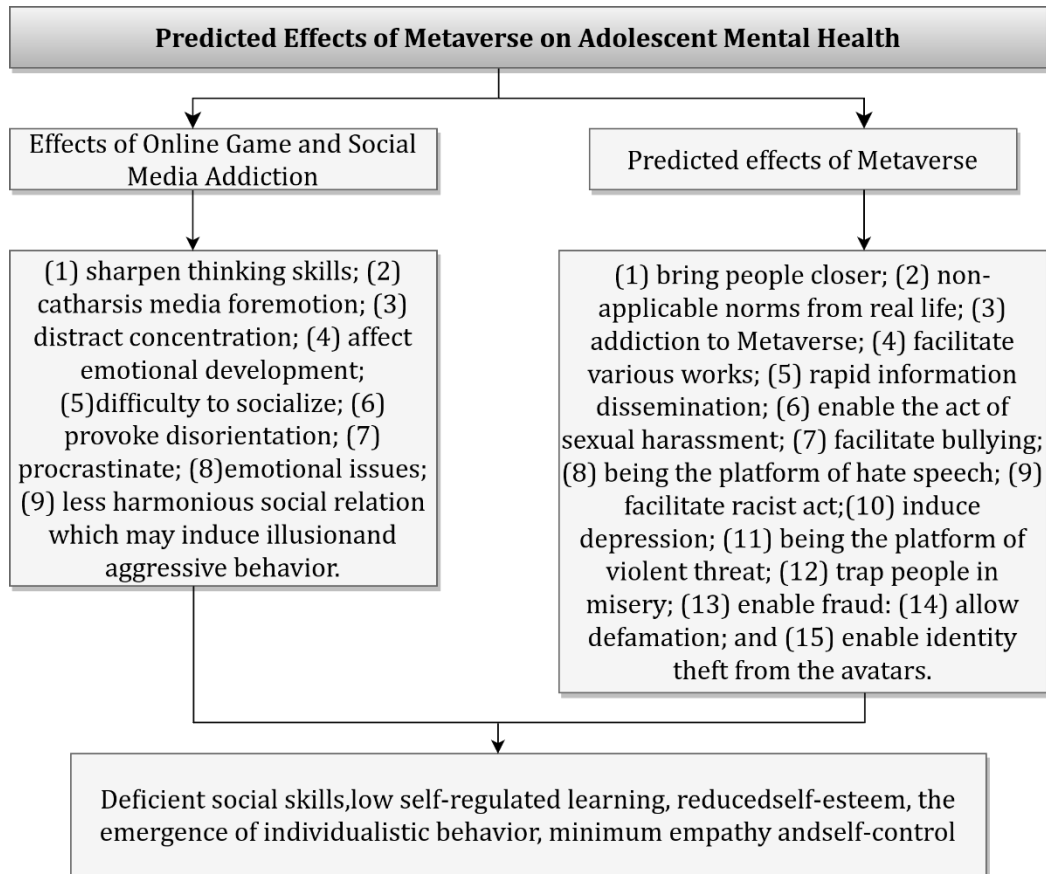


Winingsih, 2020; Fitriani, 2019). Besides, they also regard their peers as the most substantial stakeholders in their life (Santrock, 2017; Hurlock, 2014). Therefore, most individuals encounter numerous issues demanding immediate solvency for optimum development. With the presence of Metaverse, these issues become more complex, affecting their mental health.

Mental health is defined as the individual condition where they are confident in their ability, capable of solving their life problems, can be productive, and contribute to their surrounding (Usmani et al., 2022). The substantial internal factors affecting mental health are cognitive and social skills (So et al., 2022). The effects of Metaverse on human mental well-being can be predicted from the effects of online games and social media addiction. On the positive side, online game facilitates thinking skills development and can be an emotional catharsis. However, extensive online game usage can disturb concentration, affect emotional development, and complicate socialization with other people (Biegun et al., 2019; Caner & Evgin, 2021; Gundogdu & Eroglu, 2022; Ulvi et al., 2022; Yang et al., 2021). Moreover, social media and the online game can induce disorientation, procrastination, and emotional disorders, as well as a less harmonious social relationship that triggers illusion and aggressive behavior (Beeres et al., 2021; Biegun et al., 2019; Fauziah et al., 2018; Gao et al., 2020; Yudhi et al., 2021; Valkenburg et al., 2022).

In addition, Garavand and Aslani (2022) uncovered that Metaverse aids individuals to feel closer to people living far away since Metaverse presents a similar space to their real life, so it possibly serves as second life. This virtual space also offers potential changes, along with novel behavioral problems, such as: (1) a shift of social interaction patterns, including the aspects of values, norms, and behavior; (2) non-applicable norms from real life; (3) addiction on Metaverse; (4) enable completion of various works; (5) rapid information dispersion; (6) facilitate the act of social harassment; (7) being the platform of bullying; (8) enable hate speech; (9) facilitate racism; (10) induce depression; and (11) facilitate violent threat (Dwivedi et al., 2022; Usmani et al., 2022). Besides, Metaverse also sustains the establishment of a data-based smart city that possibly increases the individualistic characteristic (Bibri & Allam, 2022). Floridi (2022) argued that adolescents access Metaverse to escape their misery, so they may not move on from their problems. Metaverse is also predicted to promote fraud, defamation, identity theft, and other offenses through avatar usage (Cheong, 2022).

Therefore, Metaverse potentially affects adolescents' mental health, specifically in the non-cognitive aspects, resulting in deficient social skills, low self-regulated learning, reduced self-esteem, increased individualistic character, insignificant empathy, and inadequate self-control, which affect the adolescents' learning results, as shown in Figure 3. A study conducted by Chrisna (2019) reported that learning management, self-regulation, motivation, empathy, skills, and self-confidence simultaneously impact students' academic achievement. Partially, learning management, self-regulation, empathy, skills, and self-confidence carry no influence on students' academic attainment. Motivation is the only aspect observed to impact students' academic excellence partially.



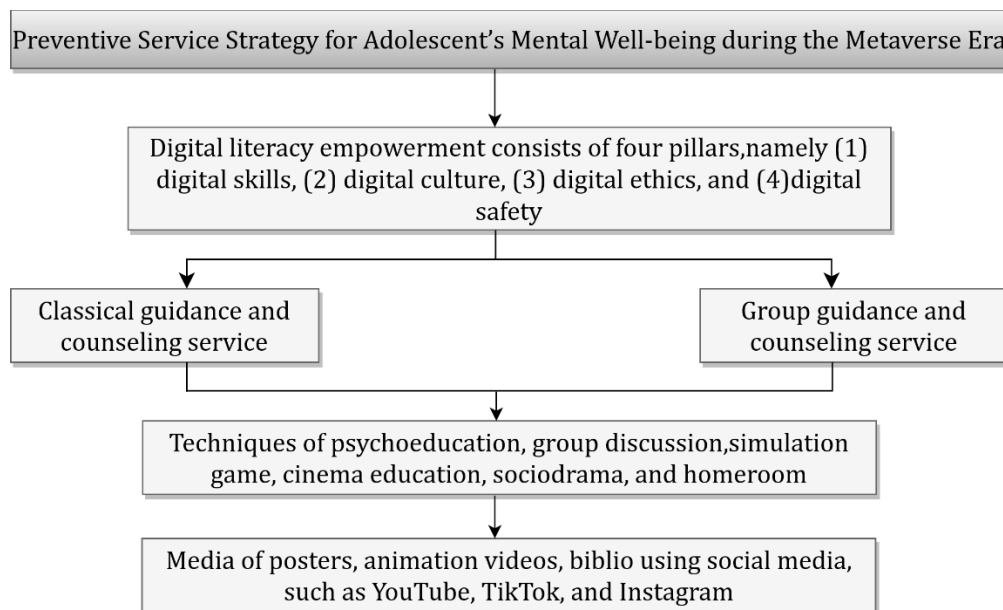
**Figure 3. Predicted Effects of Metaverse on Teenagers' Mental Well-Being**

#### 4.3. Preventive Guidance and Counseling Strategy for Developing Adolescents' Literacy on Mental Health in the Metaverse Era

It is anticipated that Metaverse would pose a risk to the mental health of youth. The issues of deficient social skills, problematic self-regulated learning, insufficient self-esteem, individualism, minimum empathy, and low self-control is predicted to be atomic bomb requiring prompt solvency. Before they turn into substantial issues following massive usage of Metaverse, an accurate preventive program is needed (Erlisa & Daulay, 2022; Hariko et al., 2021; Neviyarni & Novita, 2022; Utaminingsih & Lianasari, 2022). As this study refers to the research focusing on game and social media addiction in predicting the effects of Metaverse, the preventive measures can also be formulated based on the research discussing intervention for the game and social media addiction on adolescents (Nugraha, Awalya, & Mulawarman, 2021).

The preventive measures aim to help adolescents to use Metaverse in a positive and wise manner (Muslihati et al., 2023). Therefore, we need to empower their social skills, self-regulated learning, self-esteem, empathy, and self-control. Additionally, Metaverse is closely correlated with numerous digital information, thus, the empowerment of digital literacy is forecasted to aid youths in encountering the Metaverse advancement (Apriliyanti, Setiawan, & Yazid, 2022). The digital literacy strengthening cover four pillars, namely: (1) digital skills, which relate to individual capacity in identifying, comprehending, and using hardware, software, as well as digital operation system in daily life; (2) digital culture, which represents the activities in digital spaces, based on national insight, Pancasila and diversity values; (3) digital ethics which is the ability to be aware of, consider, and establish digital ethics management in daily life; and (4) digital safety which covers the individuals' ability to identify, implement, and increase their personal digital data protection and safety (Kominfo, 2021).

Consequently, the topics and contents for classical and group counseling should be arranged in an attractive display to gain the interest of adolescents. The Metaverse environment uses highly sophisticated technology, so the guidance and counseling program should adopt the technology devices (Erlisa & Daulay, 2022). The preventive empowerment measures, focusing on the youth's digital literacy and non-cognitive skills, should be included in the classical and group counseling strategy, using numerous techniques and media. The suggested techniques are group discussion, simulation games, education cinema, sociodrama, and homeroom (Defisah, Heriansyah, Irawan, Kurniawan, & Pratiwi, 2021; Kartikasari & Prasetiawan, 2022; Utaminingsih & Lianasari, 2022; Zen, Muslihathi, Rahman, & Multisari, 2020). Further, the school counselors can also use learning media, such as posters, animation videos, and Biblio, using social media, like YouTube, TikTok, and Instagram (Dewanti & Sujarwo, 2021; Jerasa & Boffone, 2021; Lewoleba et al., 2022; van der Bend et al., 2022; Yunianto & Astuti, 2022). The formulated preventive strategy for adolescents' mental health is illustrated in Figure 4.



**Figure 4. Preventive Guidance and Counseling Strategy to Develop Adolescents' Mental Health Literacy in the Era of Metaverse**

## 5. Conclusion

Metaverse will facilitate the education field through the 3D virtual concept combining augmented and virtual reality since this ecosystem is inseparable from daily human life. Students' fondness for games and social media sufficiently illustrates their dependence on developed technology. The predicted negative influences on the youth's well-being include deficient social skills, low self-regulated learning, decreased self-esteem, increased individualism, insufficient empathy, and reduced self-control, which affect their learning results. As a preventive measure, the school counselor can provide guidance and counseling services focusing on the empowerment of social skills, self-regulated learning, self-esteem, individualistic character, empathy, and self-control. Besides, the guidance and counseling services may also use digital literacy education, which contains four pillars: (1) digital skill, (2) digital culture, (3) digital ethics, and (4) digital safety. The program can be implemented through classical and group counseling strategies, with psychoeducation, group discussion, simulation game, education cinema, sociodrama, or homeroom techniques. For the media, the program can be implemented using a poster, animation video, and biblio with social media, such as YouTube, Tiktok, and Instagram.

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All authors have equal contributions to the paper. All the authors have read and approved the final manuscript.

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# Bagaimana Mencegah Masalah Kesehatan Mental Mahasiswa di Era Metaverse?

## Kata kunci

Metaverse  
Kesehatan mental remaja  
Bimbingan kelompok

## Abstrak

*Metaverse* yang merupakan perpaduan inovasi teknologi media sosial, *game*, dan *virtual reality*, adalah konsep baru yang menarik perhatian berbagai kalangan. Konsep ini juga telah membantu banyak kalangan, termasuk akademisi. *Metaverse* yang menawarkan berbagai cara untuk berinovasi, juga diproyeksikan akan mengubah kehidupan manusia dan pola interaksi. Namun, *Metaverse* juga menghadirkan sejumlah dampak negatif terhadap kesehatan mental, bahkan lebih besar dari dampak *game online*. Tinjauan literatur ini bertujuan untuk mengkaji dampak *Metaverse* pada remaja kemudian mengembangkan strategi pencegahan yang relevan melalui program bimbingan dan konseling sekolah. Penelitian ini dilatarbelakangi oleh minimnya penelitian terkait dampak *Metaverse* terhadap kesehatan mental remaja dan strategi intervensi. Dengan menerapkan langkah-langkah PRISMA, penelitian dilakukan terhadap artikel ilmiah terbitan tahun 2017 hingga 2022 yang diekstrak menggunakan aplikasi Publish or Perish. Dari proses pengumpulan data, kami mengumpulkan dan menganalisis 25 artikel relevan dari ScienceDirect, SpringerLink, Sage Journals, Google Scholar, WoS, ProQuest, Taylor & Francis Group, Emerald Insight, DOAJ, dan Garuda. Hasil analisis kami menunjukkan bahwa *Metaverse* berpotensi berdampak negatif pada remaja, terutama pada aspek non-kognitif, seperti keterampilan sosial, empati, harga diri, pengendalian diri, dan pembelajaran mandiri. Selain itu, diperlukan strategi bimbingan dan konseling dasar dengan berbagai pendekatan dan teknik, khususnya bimbingan kelompok dengan menggunakan teknologi informasi dan media sosial untuk mengembangkan literasi remaja tentang kesehatan jiwa di era *Metaverse* ini.