



# INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



## The Dark Side of Massive Multiplayers Online Role's Game (MMORPG) among Malaysian Gamer Addiction's and Aggressive Behaviour: Systematic Literature Review

Mohd Ziyad Afiq Zaharim, Azlina Mohd Khir, Amna Md Noor & Nik Ahmad Sufian Borhan

To Link this Article: <http://dx.doi.org/10.6007/IJARBSS/v12-i12/16027> DOI:10.6007/IJARBSS/v12-i12/16027

Received: 21 October 2022, Revised: 23 November 2022, Accepted: 08 December 2022

Published Online: 25 December 2022

In-Text Citation: (Zaharim et al., 2022)

To Cite this Article: Zaharim, M. Z. A., Khir, A. M., Noor, A. M., & Borhan, N. A. S. (2022). The Dark Side of Massive Multiplayers Online Role's Game (MMORPG) among Malaysian Gamer Addiction's and Aggressive Behaviour: Systematic Literature Review. *International Journal of Academic Research in Business and Social Sciences*, 12(12), 2400 – 2415.

Copyright: © 2022 The Author(s)

Published by Human Resource Management Academic Research Society ([www.hrmars.com](http://www.hrmars.com))

This article is published under the Creative Commons Attribution (CC BY 4.0) license. Anyone may reproduce, distribute, translate and create derivative works of this article (for both commercial and non-commercial purposes), subject to full attribution to the original publication and authors. The full terms of this license may be seen at: <http://creativecommons.org/licenses/by/4.0/legalcode>

Vol. 12, No. 12, 2022, Pg. 2400 – 2415

<http://hrmars.com/index.php/pages/detail/IJARBSS>

JOURNAL HOMEPAGE

Full Terms & Conditions of access and use can be found at  
<http://hrmars.com/index.php/pages/detail/publication-ethics>



# INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES



www.hrmars.com

ISSN: 2222-6990

## The Dark Side of Massive Multiplayers Online Role's Game (MMORPG) among Malaysian Gamer Addiction's and Aggressive Behaviour: Systematic Literature Review

Mohd Ziyad Afiq Zaharim, Azlina Mohd Khir, Amna Md Noor & Nik  
Ahmad Sufian Borhan

Department of Social and Development Sciences, Faculty of Human Ecology, Universiti Putra  
Malaysia

Email: m\_azlina@upm.edu.my

### Abstract

Massively Multiplayer Online Role-Playing Games or MMORPG is a real-time game that requires a strong internet connection and interaction with millions of players. Youths use MMORPG for leisure, stress relief, or to escape their lonely lives by interacting with people in a virtual world. This systematic literature review aimed to study the negative impact of MMORPG addiction among Malaysian youths. Systematic searches of Scopus, SpringerLink, ScienceDirect, Google Scholar, and Dimension database were conducted according to PRISMA guidelines which resulted in more than 13,000 articles, of which seven journal articles met the inclusion criteria. This study identifies negative impacts of MMORPG addiction among Malaysian youths such as psychological distress, depression, poor time management and reducing sense of empathy. We discuss and categorise the findings into two sub-themes: (1) Proactive Action Effects (PAE) and (2) Reactive Action Effects (RAE). We also suggest that each negative impact causes a short- or long-term effect which provides an in-depth understanding of the prediction of aggressive behaviour. This study ends with recommendations for future research.

**Keywords:** Online Gaming, Prosocial Aggressive Behaviour, Gaming Addiction, Research Paper, MMORPG

### Introduction

Industrial Revolution (IR) 4.0 is a fusion of advances in artificial intelligence (AI), robotics, the Internet of Things (IoT), 3D printing, genetic engineering, quantum computing, and other technologies which becoming an essential and inseparable component of our daily lives, mirroring the rapid growth of the information technology sector (Jaafar et al., 2021). Video gaming has been a popular leisure pursuit since the 1970s (Wolf, 2008). An online video game such as Massively Multiplayer Online Role-playing games (MMORPG) also provides extra

features for social engagement. Some examples of MMORPGs are Fortnite, Fall Guys, and Animal Crossing.

MMORPGs constitute a hedonic information system where users play for enjoyment (Ghazali et al., 2018; Esteves et al., 2021). It also involves players customising their fictional in-game characters, interacting with other game players, and exploring never-ending immersive virtual worlds, which are potentially addictive (Lee et al., 2021). MMORPGs are one of the most appealing games to youth nowadays. Furthermore, it is considered a “special kind” of online gaming segment in which players get to play games on the Internet from different backgrounds (Zhong, 2011). MMORPGs also produce many types of games featured in a single game with thousands of players (Merrick et al., 2013).

Nevertheless, MMORPGs also have a significant addiction. The addiction is known as the psychological state of maladaptive dependency on playing MMORPGs, which is “manifested through an obsessive pattern of IT-seeking and IT-use behaviours that take place at the expense of other important activities and infringe normal functioning” (Lee et al., 2021). In addition, Alrobai et al (2016) also emphasised that gaming had a significant negative impact on personal life development.

### **The Need for a Systematic Literature Review (SLR)**

Since this pandemic Coronavirus-19 outbreak in 2019, our lives have radically changed in terms of health, economy, and psychosocial perspectives that have caused unprecedented disruptions in the 21st century (Xu et al., 2021). The COVID-19 pandemic causes stress in multiple aspects. For example, it may trigger increased behaviours or actions (e.g., online gaming) as putative coping strategies and develop habits that are difficult to break (Montag & Elhai, 2020; Xu et al., 2021). The remote schooling and limited activities during the pandemic also have led to a massive rise in gaming addiction among children and young adults aged 7 to 25 (King et al., 2020). The issue is that the audiences, for instance, preschool-aged boys are in a stage of personality development that may be detrimentally affected by this behaviour (Coyne et al., 2017). As such, it is timely to investigate the possible adverse effects of the COVID-19 pandemic on the substance used and addictive behaviour to provide a better understanding.

To produce quality evidence, this study uses Systematic Literature Review (SLR) to help understand the negative impacts of playing MMORPG among Malaysia addictive players. This methodology is employed as it involves screening strategies in retrieving the articles, providing a wide area of research, and creating a purposeful objective. SLR also offers several advantages compared to the conventional style of reviewing journal articles. This methodology also encourages researchers to look for studies outside their subject areas and networks using extensive searching methods, predefined search strings, and standard inclusion and exclusion criteria (Robinson & Lowe, 2015). SLR also identifies, selects, and critically appraised research to answer a formulated question (Dewey & Drahota, 2016).

This study will contribute to the online gaming addiction corpus and aggressive behaviour research in social sciences. The main research question for this study is: What are the disadvantages of playing MMORPG among Malaysian gamers?

## **Methodology**

This SLR employed the Preferred Reporting Items for Systematic reviews and Meta-Analyses or PRISMA protocol (Moher et al., 2015) to retrieve journal articles on the negative effect of playing MMORPG among addictive players in Malaysia. The methodology is discussed thoroughly in this section.

### **The Preferred Reporting Items for Systematic Reviews and Meta - Analyses (PRISMA) protocol**

The PRISMA protocol made it possible to identify primary research themes and paths of inquiry that offer scientific understanding (Valverde-Berrocso et al., 2020). We examined the overall effect for MMORPG gamers in terms of psychosocial well-being, and thus our literature search sought to locate all available reports examining those associations.

The advantages of systematic reviews are numerous. They begin by providing a thorough and concise summary available on the journal database about a particular subject. Three premises for conducting systematic reviews are to reduce large amounts of information into comprehensible thematic, aggregate critical information for decision-making, and efficiently move from knowledge discovery to implementation. According to Budgen et al (2007), a successful review involves three major stages: planning, conducting, and reporting.

## **Resources**

While some databases have superior functions and advantages, they still have weaknesses, such as low sensitivity towards keywords and limited search functions (Bates et al., 2017). Xiao and Watson (2019) revealed that no database is comprehensive. Thus, the SLR should be made from several databases. Shaffril et al (2021) also emphasised that there is no perfect database to gather all information in any field of study. Therefore, Younger (2010) claimed that this technique would allow the selected databases to complement their weaknesses.

The review relied on five journal databases – Google Scholar, Scopus, Dimension, ScienceDirect, and Springer link as they were considered reliable databases containing journals related to the field of social psychology. These sources are robust databases consisting of thousands of journals covering many disciplines, including subjects related to social sciences studies. Google Scholar participates with approximately 2,900 scholarly publishers and includes more than 10 million items from Google Book Search (Jacso, 2010). Haddaway et al (2015) claimed that Google Scholar is an excellent supporting database in the searching process. Moreover, Scopus is the second most used journal database for systematic reviews. It is one of the largest abstract and citation databases of peer-reviewed literature from 22,800 journals from 5,000 publishers worldwide. Scopus covers diverse subjects such as environmental sciences, social science, agriculture, and biological sciences.

## **The systematic review process for selecting the articles**

### ***Identification***

There are four stages in the systematic review process. The review process commenced in May 2022. The first stage Identification requires the researcher to identify the keywords used for the search tab by relying on similar keywords used in previous studies related to the research topic based on Table 1.

Table 1

*Keywords and Searching Information Strategy*

Databases	Keywords used / Search string
Google Scholar/ SpringerLink/ ScienceDirect/ Dimension	"mmorpg" "massively multiplayer online role-playing games" "Malaysia" "game" "online game" "gamer"
Scopus	TITLE-ABS-KEY (("MMORPG" OR "massively multiplayer online role-playing games" OR "online game*" OR "game*") AND ("malaysia*"))

**Screening**

The screening stage requires the researcher to remove duplicate articles. At this stage, journal articles are reviewed based on the inclusion and exclusion criteria in Table 2, in which two journal articles were removed. The first criterion requires the type of literature in the form of journal articles that provides empirical data related to research questions. This review does not include publications in the form of systematic reviews, meta-analyses, or book chapters. All articles selected for the reviewing process are in the English language. Non-English publications were excluded to avoid confusion. Furthermore, the journal articles must present empirical data and publish between 2018 and 2022. The publication years are adequate to see the evolution of research and related publications. Lastly, in line with its objective focuses on the negative impact of MMORPGs on local players, only studies done in Malaysia were selected. The eligibility and exclusion criteria is summarised in Table 2.

Table 2

*The Inclusion and Exclusion Criteria*

Criterion	Eligibility	Exclusion
Literature type	Journal (research articles)	Journals (systematic review), book series, book, chapter in book, conference proceeding
Language	English	Non-English
Timeline	Between 2018-2022	<2018
Indexes	Social Science Citation Index, Emerging Sources Citation Index, related psychology Index	Science Citation Index Expanded
Country	Malaysia	Outside Malaysia

**Eligibility**

A total of 16 articles were prepared for the eligibility stage. At this stage, the titles, abstracts, and main contents of all the articles were examined thoroughly to ensure that they fulfilled the inclusion criteria and fit to be employed in the present study to achieve the objective.

Consequently, a total of 13,295 articles were excluded as they are not related to the research question and the topic. Finally, a total of 7 articles were analysed (refer Figure 1).

### Data Abstraction and Analysis

At this stage, a thematic analysis method was carried out to develop appropriate themes analysing the 7 selected journal articles. Statements and information that are related to the research questions were extracted as data (refer table 3). In the second phase, the authors created significant groups via coding method according to the nature of the data. Afterwards, the authors resumed the process by arranging the themes, concepts, or ideas which are connected. Consequently, this process eventually resulted in a total of two themes as stated in Table 4.

These processes of developing the appropriate themes were carried out based on thematic analysis.

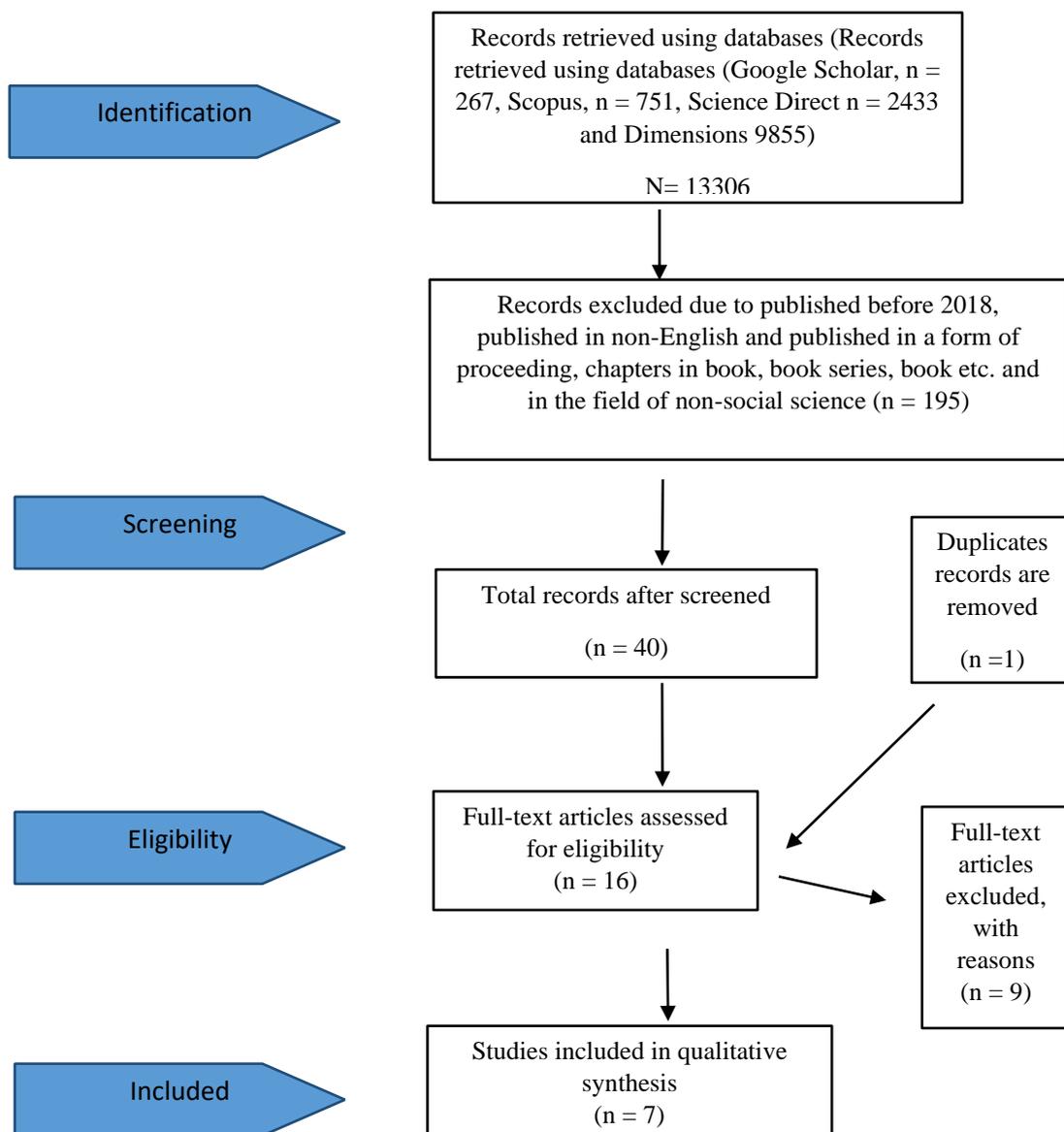


Figure 1: Flow Diagram of the Study adapted from Moher et al (2009)

## Result

### General Findings

The analysis produced seven journal articles on disadvantages of MMORPG. Table 3 below is the summary of the findings

Table 3

#### General Findings

No	Title	Author	Year	Negative effect(s)
1	Effects of playing violent video games on teenagers' behaviour – An experience from Malaysia	Marzo et al	2019	<ul style="list-style-type: none"> <li>Reducing the sense of empathy</li> <li>Lack of altruism attitude</li> </ul>
2.	Digital Addiction: Systematic Review of Computer Game Addiction Impact on Adolescent Physical Health	Aziz et al	2021	<ul style="list-style-type: none"> <li>Addiction will lead to depression</li> <li>time management problem of using internet</li> </ul>
3.	E-Entertainment: Factors to Online Game Addiction Among TAR UC Students In KL	Yaw et al	2021	<ul style="list-style-type: none"> <li>Depression and loneliness have a high positive correlation with online game addiction</li> </ul>
4.	Need Frustration, Gaming Motives, and Internet Gaming Disorder in Mobile Multiplayer Online Battle Arena (MOBA) Games: Through the Lens of Self-Determination Theory	T'ng et al	2022	<ul style="list-style-type: none"> <li>Uncontrolled behaviour</li> </ul>
5.	The task-based fMRI study on neural activity of internet gaming addiction among Malaysian adolescents: A Stroop colour task	Abdull Nasser et al	2021	<ul style="list-style-type: none"> <li>Positive relationship with stress disorder</li> <li>Experience hyper-activation in the occipital and parietal lobes</li> </ul>
6.	The Relationship between Internet Addiction, Internet Gaming and Anxiety among Medical Students in a Malaysian Public University during COVID-19 Pandemic	Ismail et al	2021	<ul style="list-style-type: none"> <li>Psychological distress</li> </ul>
7.	Factors Influencing the Involvement of Malaysian Youths in Massively Multiplayer Online Role-Playing Games (MMORPGs)	Mohd Yunus et al	2021	<ul style="list-style-type: none"> <li>Addiction (feeling unhappy even when they did not play the game)</li> </ul>

### Main Findings

Table 3 summarises the negative impacts of playing MMORPG among Malaysian gamers. Findings show symptoms similar to the reactive and proactive action behaviour defined in General Aggression Model (GAM) (Anderson & Bushman, 2002). According to GAM, exposure to violent games will regulate an individual's internal state (arousal, cognitive, and emotion) and lead to specific behavioural effects.

In addition, GAM also predicted that the negative consequences of exposure to violent media show a significant effect on aggressive behaviour. Therefore, the main findings were analysed thematically based on two themes; the Proactive Action Effects (PAE) and Reactive Action Effects (RAE) adapted from GAM. Proactive and reactive aggression represents a perspective that would resolve different etiological pathways to the aggression caused by psychological problems from exposure to media violence (Crick & Dodge, 1996; Dodge, 1991).

### ***Proactive Action Effects (PAE)***

Proactive aggressors engage in either physical or relational aggression -the reactive “damaged things because you felt mad” (Del Vecchio, 2011). Raine et al (2006) elaborates that proactive aggression is characterised by higher levels of psychopathic personality, blunted affect, and stimulation-seeking tendencies. Based on table 3, our result has identified that playing MMORPG causes uncontrollable behaviour. This behaviour is related to proactive aggression (T'ng et al., 2022).

According to his research, 398 mobile MOBA gamers aged 18 to 29 in Malaysia were collected using Qualtrics online survey posted in randomly selected Malaysian MOBA Facebook groups. The MOBA game groups were searched by inserting keywords (i.e., Mobile Legends Malaysia, Honour of Kings Malaysia, DOTA 2 Malaysia, Leagues of Legends Malaysia, Pokémon UNITE Malaysia, Onmyoji Arena Malaysia, Arena of Valor Malaysia) into the Facebook search. A random number was assigned for each identified Facebook group. 19 groups were sampled using the non-probability sampling method, specifically purposive sampling via an online survey, which was implemented for data collection. The contribution of negative emotion (e.g., frustration, depression) frustrated players face challenges in attaining desired real-life accomplishments and are risky to the uncontrollable form of behaviour.

### ***Reactive Action Effects (RAE)***

Bertsch et al (2020) defined reactive aggression as a response to social threat, provocation, or frustration and is strongly associated with anger. Raine et al (2006) emphasised that reactive aggression would be associated with an impulsive personality and higher scores on hostile aggression. Based on the GAM model, individual behaviour is affected by situational factors such as violence and media exposure. The reaction from violent exposure is known as impulsive action or reactive action effect (RAE). Our findings in Table 3 demonstrated that six RAE of playing MMORPG may lead to aggression based on GAM (Anderson & Bushman, 2002).

Research by Marzo et al (2019) found that exposure to violent media will reduce the sense of empathy and altruism attitude among local gamers. Second, Aziz et al (2021) emphasised that addiction will lead to depression and time management problems when using the internet. Third, Yaw et al (2021) elaborate on the positive correlation between depression and loneliness with online game addiction. Abdull Nasser et al (2021) discussed that playing MMORPG caused stress disorder and the individual may experience hyper-activation in the occipital and parietal lobes. Ismail et al (2021) also emphasised that playing MMORPG causes psychological distress. Finally, Yunus et al (2021) suggest that playing MMORPG causes addiction which can be seen when the individuals feel unhappy even when they do not play the game.

In summary, reactive aggression is exposure to violent media, especially violent games. Most research has found that violent video games increase aggressive thoughts, anger,

physiological arousal, and aggressive behaviours and decrease empathic feelings and helping behaviours (Gentil et al., 2017; Verheijen et al., 2018).

In addition, some research in cognitive neuroscience has provided neuroimaging support for these effects (Gentil et al., 2016); and some meta-analyses have concluded that violent video games increase aggression (Bushman, 2016). Therefore, reactive action driven by anger will lead to reactive aggression as a form of aggressive behaviour.

### **Discussion**

The SLR presented herein examines the negative effect of playing MMORPG among local players in Malaysia. The findings revealed that 7 articles reported the disadvantages of playing MMORPG games among Malaysian gamers. Furthermore, as expected, a plausible assumption based on the General Aggression Model, GAM (Anderson & Bushman, 2002) informed that exposure to violent media such as MMORPG leads to aggressive behaviour. Most research in this area has found that violent video games increase aggressive thoughts, angry feelings, physiological arousal, and aggressive behaviours and decrease empathic feelings and helping behaviours (Gentil et al., 2017; Verheijen et al., 2018). In addition, some research in cognitive neuroscience has provided neuroimaging support for these effects (Gentil et al., 2016). A meta-analysis has concluded that violent video games increase aggression (Bushman, 2016; Greitemeyer & Mugge, 2014).

Apart from that, according to GAM by Anderson and Bushman (2018), aggressive behaviour may cause short-term and long-term media violent media effects. The short-term media effects happened due to three psychological processes. First, is the process when there is an increase in the physiological arousal stimulated by media violence. It is due to the priming or activation of aggressive concepts in memory. This effect also may be caused by the simple mimicking of aggressive behaviour. The long-term violent media effects are mainly due to two psychological processes; (1) social learning caused by observing an aggressive model or (2) due to the desensitisation of emotional processes that occur after repeated exposure to violent media (Anderson & Bushman, 2018). These findings are summarised in Table 4.

Table 4

*Negative effect(s) of MMORPGs*

	RAE	PAE
<b>Violent media effects</b>	6	1
<b>Short-term (ST)</b>		
<ul style="list-style-type: none"> <li>Increases in physiological arousal stimulated by media violence</li> <li>The priming or activation of aggressive concepts in memory</li> <li>Simple mimicking of aggressive behaviour.</li> </ul>		<b>xxx</b>
<b>Long-term (LT)</b>		
<ul style="list-style-type: none"> <li>Social learning that occurs by observing an aggressive model</li> <li>Desensitisation of emotional processes that occur after repeated exposure to violent media</li> </ul>		<b>xxxx</b>

*Note:* Adopted from: Anderson and Bushman (2018); **RAE**=Reactive Action Effect ; **PAE**=Proactive Action Effect ; **x** = significant with PAE or RAE

Based on the table above, the negative impacts of playing MMORPG that are categorised as RAE are addiction to feeling unhappy when not playing, depression, and loneliness. Furthermore, addiction will lead to depression and time management problems of using the internet, reducing the sense of empathy, not having an altruistic attitude, and experiencing hyper-activation in the brain activity. Meanwhile, PAE is a short-term effect for gamers with uncontrolled behaviour when playing MMORPG.

The focus of this RAE and PAE is on micro-level aggression effects theories. Table 5 lists the micro-level aggression effects theories that have been identified as particularly significant to support RAE and PAE as well cited in these studies. Valkenburg and Peter (2013) have lately made an effort to categorise current micro-level media effects hypotheses according to their underlying tenets. They discovered that these hypotheses varied significantly in their conceptualization of the effects process. Some theories, particularly older ones, are primarily concerned with unidirectional linear correlations between violent gaming exposure effects and certain outcomes (for example, cultivation theory) (Gerbner et al., 1980). Other, more extensive theories (e.g. Bandura, 2002; Slater, 2007) focus on the interaction of media and non-media elements (e.g., media use, media processing) (e.g., disposition, social context).

Table 5  
*Micro-level aggression effects theories supporting RAE and PAE*

Author	Theories	Descriptions
McCombs & Shaw (1972)	Agenda-setting theory	Describes how the news media can affect the prominence of issues on the public agenda.
Gerbner et al. (1980)	Cultivation theory	Argues that individuals are more inclined to believe the social reality portrayed on television if they spend more time "living" in it.
Entman (1993) Scheufele (1999)	Framing Framing as a theory of media effect	Discusses how certain subjects are brought up in the media and given a frame, or field of meaning, that shapes how the public perceives them.
Lang (2000)	Limited-capacity model	Investigates how people's limited ability to comprehend information impacts how they remember and interact with mediated communications.
Bandura (2002)	Social cognitive theory	Examines the psychological processes by which symbolic information in the media affects people's feelings, thoughts, and behaviours.

The existing effects theories can be organized along the following five features that address the relationships between both media factors and aggressive factors and specify the boundary conditions of media violence effects. In summary, this study found that the negative impacts of playing MMORPG show a positive relationship with the time frame to stimulate aggressive behaviour among gamers.

### Conclusion

This study identifies the disadvantages of playing MMORPG and their relationships with aggressive behaviour. Two main themes that represented the main category of disadvantaged

were identified. Based on the Systematic Literature Review, the main theme that revolves falls under components found in GAM which has an amalgamation of two sub-themes. This study takes it further by analysing and categorising them into two big groups, PAE and RAE. Thus, providing a different angle of the effect by classified in a time frame based on Anderson and Bushman (2018) analysis (Table 4) and findings.

Overall, this study supports GAM by clustering and elaborating the effect of playing MMORPG among local gamers in Malaysia. Findings show that based on GAM, aggressive actions are caused by situational factors such as violent games. According to Bushman and Anderson (2021), exposure to violent media increases aggressive thoughts, anger, and physiological arousal and leads to increased hostile appraisals. Meanwhile, based on a conceptual paper by Zaharim and Zaharim (2021) noted that exposure to media violence is also associated with increased relational aggression over time. This study also suggests that the effect of exposure to MMORPG also can cause short or long-term effects.

This study provides several recommendations that may be helpful for future studies. Following the results of this study, prospective SLR should investigate the significance of periodical effects to predict aggressive behaviour. Integrating diverse research findings may assist the concerned parties in developing other SLRs focused on mediator variables for this topic. Furthermore, while situational or environmental factors are important variables to provide in-depth understanding on aggressive behaviour, future scholars should also focus on the individual factors which may influence aggressive behaviour. Scholars are encouraged to explore the advantages of playing MMORPG by selecting other independent and dependent variables.

Furthermore, it is crucial to note that the current study only provides a comprehensive review on the negative impacts of playing MMORPG. Therefore, other vital aspects for example long-term effect of engagements with complicated characters or using different variables such as type of gaming used by the Malaysian gamers have not been discussed further due to time constraint. Nevertheless, this study contributes to helping understand the dark side of MMORPG in predicting aggressive behaviours.

## References

- Abdull Nasser, N. M., Mohamad, M., Chan, L. F., Suppiah, S., Yusoff, A. N., Abd Hamid, A. I., Wan Ismail, W. S., & Sim, S. T. (2021). The Task-Based fMRI Study on Neural Activity of Internet Gaming Addiction Among Malaysian Adolescents: A Stroop Color Task. *Neurology Asia*, 26(3).
- Alrobai, A., McAlaney, J., Dogan, H., Phalp, K., & Ali, R. (2016). Exploring the requirements and design of persuasive intervention technology to combat digital addiction. In *Human-Centered and Error-Resilient Systems Development* (pp. 130-150). Springer, Cham.
- Anderson, C. A., & Bushman, B. J. (2002). Human aggression. *Annual Review of Psychology*, 53(1), 27-51.
- Anderson, C. A., & Bushman, B. J. (2018). Media violence and the general aggression model. *Journal of Social Issues*, 74(2), 386-413.
- Aziz, N., Nordin, M. J., Abdulkadir, S. J., & Salih, M. M. M. (2021). Digital Addiction: Systematic Review of Computer Game Addiction Impact on Adolescent Physical Health. *Electronics*, 10(996), 1-18.

- Bandura, A. (2002). Social cognitive theory of mass communication. In *Media Effects: Advances in Theory and Research*, ed. J Bryant, D Zillmann, pp. 121–53. Hillsdale, NJ: Erlbaum
- Bates, J., Best, P., McQuilkin, J. & Taylor, B. (2017). Will web search engines replace bibliographic databases in the systematic identification of research?. *The Journal of Academic Librarianship*, 43(1), 8–17.
- Bertsch, K., Florange, J., & Herpertz, S. C. (2020). Understanding Brain Mechanisms of Reactive Aggression. *Current Psychiatry Reports*, 22(12), 81.
- Budgen, D., Kitchenham, B., Charters, S., Turner, M., Brereton, P., & Linkman, S. (2007). Preliminary results of a study of the completeness and clarity of structured abstracts. *International Conference on Evaluation and Assessment in Software Engineering (EASE)*, 11, 1-9.
- Bushman, B. J., & Anderson, C. A. (2002). Violent video games and hostile expectations: A test of the general aggression model. *Personality and Social Psychology Bulletin*, 28(12), 1679-1686.
- Bushman, B. J., & Anderson, C. A. (2021). Solving the puzzle of null violent media effects. *Psychology of Popular Media*.
- Bushman, B. J., Newman, K., Calvert, S. L., Downey, G., Dredze, M., Gottfredson, M., Jablonski, N.G., Masten, A.S., Morrill, C., Neill, D.B., Romer, D. & Webster, D. W. (2016). Youth violence: What we know and what we need to know. *American Psychologist*, 71(1), 17-39.
- Coyne, S. M., Stockdale, L., Linder, J. R., Nelson, D. A., Collier, K. M., & Essig, L. W. (2017). Pow! Boom! Kablam! Effects of viewing superhero programs on aggressive, prosocial, and defending behaviors in preschool children. *Journal of Abnormal Child Psychology*, 45(8), 1523-1535.
- Crick, N. R., & Dodge, K. A. (1996). Social Information-processing Mechanisms in Reactive and Proactive Aggression. *Child Development*, 67(3), 993-1002.
- Del Vecchio, T. (2011). Proactive Aggressors. In: Goldstein, S., Naglieri, J.A. (Eds) *Encyclopedia of Child Behavior and Development*. Springer, Boston, Ma. [https://doi.org/10.1007/978-0-387-79061-9\\_2248](https://doi.org/10.1007/978-0-387-79061-9_2248)
- Dewey, A. & Drahota, A. (2016). *Introduction to systematic reviews: online learning module Cochrane Training*. <https://training.cochrane.org/interactivelearning/module-1-introduction-conducting-systematic-reviews>
- Dodge, K. A. (1991). The structure and function of reactive and proactive aggression. In D. J. Pepler & K. H. Rubin (Eds.), *The development and treatment of childhood aggression* (pp. 201–218). Lawrence Erlbaum Associates, Inc.
- Entman RM. 1993. Framing: toward clarification of a fractured paradigm. *Journal of Communication*, 43,51–58.
- Esteves, J., Valogianni, K., & Greenhill, A. (2021). Online Social Games: The Effect of Social Comparison Elements on Continuance Behaviour. *Information & Management*, 58(4), 103452.
- Gentil, P., Fisher, J., & Steele, J. (2017). A review of the acute effects and long-term adaptations of single-and multi-joint exercises during resistance training. *Sports Medicine*, 47(5), 843-855.
- Gentil, P., Naves, J.P.A., Viana R.B., Coswig, V., Dos Santos Vas, M., Bartel, C. & Del Vecchio, F.B. (2016). Revisiting Tabata's protocol: does it even exist?. *Medicine & Science in Sports & Exercise*, 48(10), 2070– 2071.

- Gerbner, G., Gross, L., Morgan, M., Signorielli, N. (1980). The mainstreaming of America: violence profile no 11. *Journal of Communication*, 30,10–29.
- Ghazali, E., Mutum, D. S., & Woon, M. Y. (2018). Exploring Player Behavior and Motivations to Continue Playing Pokémon Go. *Information Technology & People*, 32 (3), 646-667.
- Greitemeyer, T., & Mügge, D. O. (2014). Video games do affect social outcomes: A meta-analytic review of the effects of violent and prosocial video game play. *Personality and Social Psychology Bulletin*, 40(5), 578-589.
- Haddaway, N. R., Woodcock, P., Macura, B., & Collins, A. (2015). Making literature reviews more reliable through application of lessons from systematic reviews. *Conservation Biology*, 29(6), 1596-1605.
- Ismail, N., Tajjudin, A. I., Jaafar, H., Nik Jaafar, N.R., Baharudin, A., & Ibrahim, N.(2021). The Relationship Between Internet Addiction, Internet Gaming and Anxiety Among Medical Students in A Malaysian Public University During Covid-19Pandemic. *International Journal of Environmental Research and Public Health*, 18(22), 11870.
- Jacso, P. (2010). Metadata mega mess in Google Scholar. *Online Information Review*, 34(1),175-191.
- King, D. L., Delfabbro, P. H., Billieux, J., & Potenza, M. N. (2020). Problematic online gaming and the COVID-19 pandemic. *Journal of Behavioral Addictions*, 9(2), 184-186.
- Lang, A. (2000). The limited capacity model of mediated message processing. *Journal of Communication*, 50,46–70.
- Lee, Z. W., Cheung, C. M., & Chan, T. K. (2021). Understanding Massively Multiplayer Online Role-Playing Game Addiction: A Hedonic Management Perspective. *Information Systems Journal*, 31(1), 33-61.
- Mallett, R., Hagen-Zanker, J., Slater, R., & Duvendack, M. (2012). The benefits and challenges of using systematic reviews in international development research. *Journal of Development Effectiveness*, 4(3), 445-455.
- Marzo, R. R., Ahmad, A., Bhattacharya, S., Mun, F. Y., Rahman, J.A., Anwar Batcha, S., Rajiswaran, S. & Hon, L. C. (2019). Effects Of Playing Violent Video Games on Teenagers' Behavior—An Experience From Malaysia, *Indian Journal of Community Health*, 31(2),179-184.
- McCombs, M.E. & Shaw, D.L. (1972). The agenda-setting function of mass media. *Public Opinion Quarterly*, 36,176–87.
- Merrick, K. E., Isaacs, A., Barlow, M., & Gu, N. (2013). A shape grammar approach to computational creativity and procedural content generation in massively multiplayer online role-playing games. *Entertainment Computing*, 4(2), 115-130.
- Shaffril, M. H. A., Samsuddin, S. F., & Abu Samah, A. (2021). The ABC of systematic literature review: The basic methodological guidance for beginners. *Quality & Quantity*, 55(4), 1319-1346.
- Yunus, M. Y. H., Yusoff, N. H., & Ng, C. Y. (2021). Factors Influencing the Involvement of Malaysian Youths In Massively Multiplayer Online Role-Playing Games (MMORPGS). *Journal Of Techno-Social*, 13(1), 59-67.
- Moher, D., Liberati, A., Tetzlaff, J., Altman, D. G., & Prisma Group. (2009). Preferred reporting items for systematic reviews and meta-analyses: the PRISMA statement. *PLoS Medicine*, 6(7), e1000097.
- Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., Paul, S. Stewart, L. A. & PRISMA-P Group. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic Reviews*, 4(1), 1-9.

- Montag C. & Elhai JD (2020). Discussing digital technology overuse in children and adolescents during the COVID-19 pandemic and beyond: On the importance of considering Affective Neuroscience Theory. *Addict Behaviors Reports*,12(100313), 1-4.
- Jaafar, N. R. N., Baharudin, A., Tajjudin, I., Ling, L. S., Safarudin, A. M., Sufia, D. S. Hui, T. Y., Zulkifle, N. H., & Tan, K. A. (2021). Factors Correlated with Internet Gaming Disorder Among Malaysian University Students. *Malaysian Journal of Medical and Health Sciences*, 17(2), 54-62.
- Raine, A., Dodge, K., Loeber, R., Gatzke-Kopp, L., Lynam, D., Reynolds, C., Stouthamer-Loeber, M. & Liu, J. (2006). The Reactive–Proactive Aggression Questionnaire: Differential correlates of reactive and proactive aggression in adolescent boys. *Aggressive Behavior*, 32(2), 159-171.
- Robinson, P., & Lowe, J. (2015). Literature reviews vs systematic reviews. *Australian and New Zealand Journal of Public Health*, 39(2), 103-103.
- Scheufele, D. A. (1999). Framing as a theory of media effects. *Journal of Communication*. 49,103–22.
- Slater, M. D. (2007). Reinforcing spirals: The mutual influence of media selectivity and media effects and their impact on individual behavior and social identity, *Communication Theory*, 17(3), 281-303.
- T'ng, S. T., Ho, K. H., & Pau, K. (2022). Need Frustration, Gaming Motives, And Internet Gaming Disorder in Mobile Multiplayer Online Battle Arena (Moba) Games: Through the Lens Of Self-Determination Theory. *International Journal of Mental Health and Addiction*, 1-21.
- Valkenburg, P. M., & Peter, J. (2013). The differential susceptibility to media effects model. *Journal of Communication*. 63(2),221–243.
- Valverde-Berrocoso, J., Garrido-Arroyo, M. D. C., Burgos-Videla, C., & Morales-Cevallos, M. B. (2020). Trends In Educational Research About E-Learning: A Systematic Literature Review (2009–2018). *Sustainability*, 12(12), 1-23.
- Verheijen, G. P., Burk, W. J., Stoltz, S. E.M.J., van den Berg, Y. H. M., & Cillessen, A. H. N. (2018). Friendly fire: Longitudinal effects of exposure to violent video games on aggressive behavior in adolescent friendship dyads. *Aggressive behavior*, 44(3), 257-267.
- Wolf, M. J. P. (2008). *The video game explosion: A history from PONG to playstation and beyond*. Westport, CT: Greenwood.
- Xiao, Y., & Watson, M. (2019). Guidance on conducting a systematic literature review. *Journal of Planning Education and Research*, 39(1), 93-112.
- Xu, S., Park, M., Kang, U. G., Choi, J. S., & Koo, J. W. (2021). Problematic use of alcohol and online gaming as coping strategies during the COVID-19 pandemic: A mini review. *Frontiers in Psychiatry*,12(68594), 1-8.
- Yaw, F. Z., Cheok, K. M., Ng, K. Z., Teo, J. X., Ting, T. T., & Lim, S. M. (2021). E-Entertainment: Factors to Online Game Addiction Among Tar Uc Students In Kl. *International Conference on Digital Transformation And Applications (ICDXA)*, 184-193.
- Younger, P. (2010). Internet-based information-seeking behaviour amongst doctors and nurses: a short review of the literature. *Health Information & Libraries Journal*, 27(1), 2-10.
- Zaharim, M. Z. A., & Zaharim, A. N. B. (2021). Adapting Strategies for Parental Monitoring: Effects of Viewing Superhero Programs on Aggressiveness Among Preschool Children, *Proceeding of the International Conference on Management and Muamalah (ICoMM)*, 368-375.

Zhong, Z. J. (2011). The effects of collective MMORPG (Massively Multiplayer Online Role-Playing Games) play on gamers' online and offline social capital. *Computers in Human Behavior*, 27(6), 2352–2363.