INTERNATIONAL JOURNAL OF ACADEMIC RESEARCH IN BUSINESS & SOCIAL SCIENCES

Vol 15, Issue 3, (2025) E-ISSN: 2222-6990

Effects of Cyberbullying Behavior on Malaysian Secondary School Students' Anxiety and Self-Esteem: Do Levels of Cyberbullying and Gender Matter?

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To Link this Article: http://dx.doi.org/10.6007/IJARBSS/v15-i3/25036 DOI:10.6007/IJARBSS/v15-i3/25036

Published Date: 15 March 2025

Abstract

Cyberbullying reflected as one of social problems in Malaysia as the country ranked sixth among 28 countries and second in Asia on cyberbullying around the world. The detrimental effects of cyberbullying behavior on anxiety and self-esteem are well-established in the literature with the postulation that the higher is the level of cyberbullying experienced, the more negative is the effects. However, limited studies have examined its effects on both cyberbullies and cyber victims. Studies also showed that males are more involved in cyberbullying behavior with the greatest gender difference in Asian countries. Due to lack of researches, it is still unclear whether there is an interactions effects between levels of cyberbullying and gender on the anxiety and self-esteem of adolescents, particularly secondary school students. This study aims to fill the literature gaps by investigating the potential interactions effects between levels of cyberbullying and gender on secondary school students' anxiety and self-esteem from cyberbullies and cyber victims' perspectives. The samples consisted of 337 cyberbullies and 382 cyber victims. The results showed that there were no significant interaction effects between levels of cyberbullying or cyber victimization and gender on anxiety and self-esteem of both cyberbullies and cyber victims. However, there were main effects from these variables separately. Implications of the findings were discussed in this paper. The findings of this study can further assist in understanding more of the potential psychological vulnerability factors and consequences of cyberbullying, which could be used to optimize preventive measures and treatment.

Keywords: Cyberbullying, Cyber Victimization, Gender, Anxiety, Self-Esteem

Introduction

With the advent of Information and Communication Technology (ICT) and the rapid growth of media social usage, the place of bullying has now gone into cyber world from physical place. The expanding dominance of technology, cyberbullying, which is a term unheard of many years ago, is gradually emerging as a growing body of research. This implies that advancement

of technology has influenced a new method of bullying that has taken physical bullying to a new dimension. Cyberbullying refers to bullying or harassment that takes place anonymously in the virtual world such as social networking sites as well as using digital devices such as computer and smartphones at anytime and any place (Mahanta & Khatoniyar, 2019). This phenomenon most often involves abusive or hurtful texts, emails, posts, images and videos as well as deliberately excluding others online and gossiping or spreading rumors in an attempt to imitate and humiliate targeted individuals via online platforms (Watts et al., 2017). All these factors along with the intentional motives and power imbalance contribute to the growing prevalence of this phenomenon which involves cyberbullies and cyber victims (Buelga, et al., 2020).

Cyberbullying reflected as one of serious social problem that involves adolescents in educational spheres (Abaido, 2020). Malaysian are among the most aggressive users on social media as the country placed sixth among 28 countries and second in Asia in a survey that measures cyberbullying (Newall, 2018; Alisha, 2020). According to the United Nations Children's Fund (UNICEF), three out of 10 young Malaysian were cyberbullies (Yap, 2020). The Women's Centre for Change (WCC) found that aggressive online behaviour of Malaysians youth mostly manifests in derogatory and unsympathetic comments (Nazari, 2020). For instance, in a cyberbullying case reported in 2019, a 16-year old girl has jumped to her death from a shop lot building in Kuching, Sarawak due to comments of followers in Instagram. Likewise, there is also a 20-year-old female from Penang also committed suicide caused by the ridicule and criticism in Facebook. These cases suggest that there are needs to take into consideration gender as a factor when examined cyberbullying behavior among adolescents. However, empirical findings of studies in this area are still scare. It is unclear whether level of cyberbullying and gender matters among the involvements of adolescents. Hence, this study is conducted to better understand the prevalence and detrimental effects of of cyberbullying.Without these understanding, it is difficult for stakeholders to provide timely and effective intervention to prevent cyberbullying behavior among youth and adolescents.

Addressing cyberbullying raises awareness, helping to protect individuals from harm, especially children and teenagers (Sae-Koew et al., 2024). Past studies suggested that cyberbullying contributes to psychological, emotional, social, and academic difficulties, highlighting the importance of schools and pivotal role of school leadership establishing support systems, enforcing responsible digital behavior policies, and providing counseling services for students affected by cyberbullying (Sinthumule & Ngonyama,2022;Verlarde & Vasodavan, 2024). While numerous studies have examined the either psychological effects of cyberbullying or gender difference in cyberbullying, limited research has explored how **different levels of cyberbullying interact with gender** to influence anxiety and self-esteem in both cyberbullies and cyber victims. By examining these interaction effects, this study helps bridge the research gap and deepens our understanding, providing valuable insights for developing effective intervention strategies to address cyberbullying. This study also can support the development of informed practices and policies on anti-cyberbullying. Four research objectives were formulated to guide this investigation in this study.

1. To determine the interaction and main effects of levels cyberbullying behavior and gender on anxiety of cyberbullies.
2. To determine the interaction and main effects of levels cyberbullying behavior and gender on self-esteem of cyberbullies.
3. To determine the interaction and main effects of levels cyber victimization and gender on anxiety of cyber victims.
4. To determine the interaction and main effects of levels cyber victimization and gender on self-esteem of cyber victims.

Review of Literature

This section covers literature reviews on levels of cyberbullying and gender differences in cyberbullying. Based on the findings from the past studies and theoretical reviews, the conceptual framework of this study was developed.

Effects of Levels of Cyberbullying

Adolescence is a particularly vulnerable age for the effects of cyberbullying on their psychological well-being (Gohal et al., 2023). The negative consequences of both bullying and cyberbullying in the short, medium, and long term have been widely acknowledged and highlighted that both cyberbullies and cyber victims are at greater risk of suffering psychological disorder. The effects of cyberbullying can be more devastating than physical bullying (Baier et al., 2019; Schoeler et al., 2018).

The negative effects of cyberbullying experienced by students might be influenced by their level of involvement in cyberbullying behavior (Nur Arifah Ayub, 2023; Picolli et al.,2024). The higher is their involvement in cyberbullying, the more negative is the impacts that they experienced (Martínez-Monteagudo, et. al., 2020). In fact, students became more anxious if their involvement in cyberbullying was higher (Myers & Cowie, 2017; Peled, 2019), particularly those being cyber victimized were likely to have lower self-esteem than cyberbullies (Field, 2018; Palermiti et al., 2016). Similarly, majority of the cyber victims became insecure and over-sensitive towards their surroundings as their levels of cyberbullying increases (Lai et al., 2017) due to the anonymity and unknown identities of the cyberbullies in the social media (Tommy et al., 2020).

The negative effects of cyberbullying behavior might be less vigorous on cyberbullies compared to physical bullying due to their non-face-to-face interactions (Brack & Caltabiano, 2014; Gunther et al., 2016; Kumar & Goldstein, 2021). Nevertheless, there was findings showed that cyberbullies generally have low self-esteem and they prompt to use the technology as a way to relieve their frustrations and problems expressing their emotions appropriately (Livazovic & Ham, 2019). Hence, the results on the effects of cyberbullying behavior on adolescents still require more extensive research, especially on cyberbullies as more attentions were given to cyber victims.

Gender Differences in Cyberbullying

The terms of gender recognize the influence of biological, cultural and experiential factors for explaining aggressive behavior (Peled, 2019). Gender studies on cyberbullying have attempted to discover which gender is more involved in cyberbullying. Studies showed that males are more involved in cyberbullying behavior with the greatest gender difference,

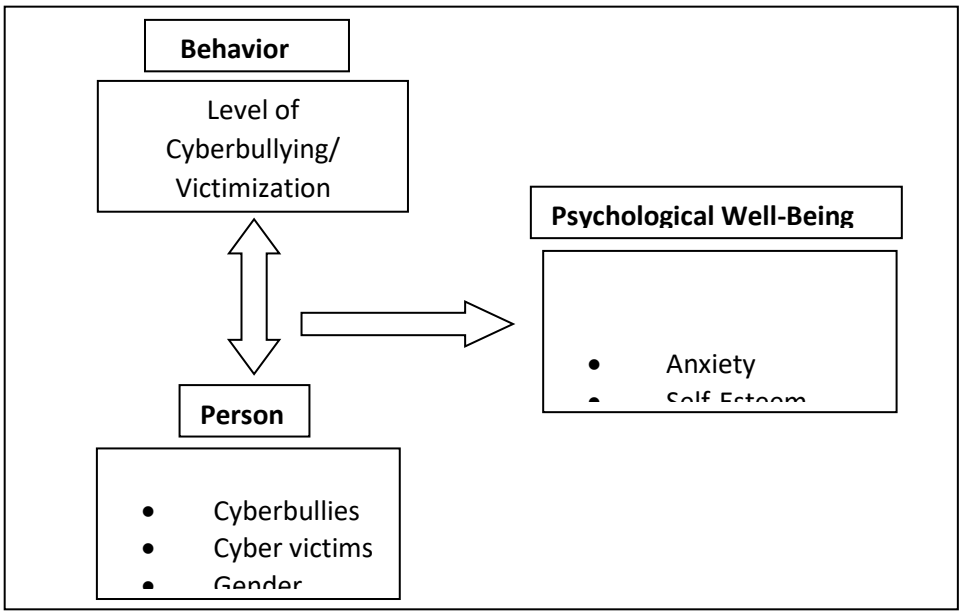
especially in Asian countries (Ely Zarina Samsudin et al., 2023; Foody et al., 2019). This suggests that gender is an important determinant in cyberbullying behavior among the Asian communities (Navarro, 2016; Sun et al., 2016).

However, there were inconsistent findings regarding gender factor in past studies. While other research findings have not been clearly stated whether gender plays a role in cyberbullying (Ahmad Faqih Ibrahim et al., 2022; Festl & Quandt, 2016). It implicits that the past findings cannot affirm whether cyberbullying is gender-specific behaviour. In cyberbullying, the gender differences seem to be less prominent than in physical bullying. Since cyberbullying does not call for physical strength, females could to a greater extent dare to bully others through online.This implies that females may not have the physical capacities to bully physically but they are able to cyberbully in an online environment and they are at greater risk of becoming cyberbullies (Carvalho et al., 2021). Although the results on the role of gender are not conclusive, gender factors have been evaluated in cyber victimization and emphasize that females prone to become cyber victims (Inchley et al., 2020; Livazovic & Ham, 2019; Rodríguez-Domínguez et al., 2020). A longitudinal study also found different developmental patterns of cyberbullying victimization by gender (Lee et al., 2022).

Some previous studies (e.g., Chao & Yu, 2017 ; Sasson & Mesch, 2017, Zhong et al., 2021) discovered that gender was a risk factor for cyberbullying whereas several past studies found that it is not a significant predictor of cyberbullying behavior and cyber victimization (e.g., Balakrishnan, 2015; Shin & Ahn, 2015; Palermiti et al., 2016). Exploring gender differences in cyberbullying instances is relevant for the development of suitable intervention strategies (Smith et al., 2019). It is unclear that whether there are needs to provide support to cyberbullies and cyber victims according to their gender as there is lack of research on effects of cyberbullying on the anxiety and self-esteem between males and females. The study of the relationship between cyberbullying and psychological well-being (anxiety and self-esteem) in adolescence would be incomplete if gender were not considered .Thus, it requires more research in this area and this study aimed to fill in the research gaps.

Theoretical Framework

This study is supported by an underlying theoretical framework (Figure 1), which is based on social cognitive theory and cyberbullying model (Xiao & Wong, 2013; Barlett & Gentile, 2012). Social cognitive theory proposed that there is an interaction between behavioral factor (e.g., levels of cyberbullying/victimization) and the personal factor (e.g., cyberbullies/victims, gender) which influence one's psychological well-being, as supported by the cyberbullying model (Barlett & Gentile, 2012). According to Barlett and Gentile (2012), in cyber or online environment, cyberbullies are anonymously when attacking their victims, hence, the effects of cyberbullying on their psychological well-being (e.g., anxiety, self-esteem) may be different from their victims. Cyber victims are more vulnerable. In other words, there may be interaction effects between levels of cyberbullying behavior/cyber victimization with gender on the anxiety and self-esteem of cyberbullies and victims.



Adapated from Xiao & Wong (2013) and Bartlett & Gentile (2012)
Figure 1: Cyberbullying Model (Adapted from Xiao & Wong, 2013; Barlett & Gentile, 2012)

Based on the literature reviews and theoretical framework (Figure 1), the following hypotheses were formulated:

H1 : There is a significant interaction effect between levels of cyberbullying behavior and gender on anxiety of cyberbullies.
H1(a) : There is significant main effect of levels of cyberbullying behavior on anxiety of cyberbullies.
H1(b) : There is significant main effect of gender on anxiety of cyberbullies.
H2 : There is a significant interaction effect between levels of cyberbullying behavior and gender on self-esteem of cyberbullies.
$H2_{(a)}$: There is significant main effect of levels of cyberbullying behavior on self-esteem of cyberbullies.
$H2_{(b)}$: There is significant main effect of gender on self-esteem of cyberbullies.
H3 : There is a significant interaction effect between levels of cyber victimization and gender on anxiety of cyber victims.
$H3_{(a)}$: There is significant main effect of levels of cyberbullying behavior on anxiety of cyber victims.
$H3_{(b)}$: There is significant main effect of gender on anxiety of cyberbullies.
H4 : There is a significant interaction effect between levels of cyberbullying behavior and gender on self-esteem of cyber victims.
$H4_{(a)}$: There is significant main effect of levels of cyberbullying behavior on self-esteem of cyber victims.
$H4_{(b)}$: There is significant main effect of gender on self-esteem of cyber victims.

Method

Participants

This study employed a quantitative research design to examine the effects of gender and level of cyberbullying behavior on cyberbullies and cyber victims' anxiety and self-esteem. A total

of 900 of 16 years old secondary school students were selected from 10 national secondary schools in the state of Penang, Malaysia for screening through a questionnaire survey to identify the cyberbullies and cyber victims. Out of 900 secondary school students that have been screened, it was found that a total of 719 of secondary students (males =384; females= 335) have experience in cyberbullying. Out of this sample, 337 identified were cyber bullies and 382 were cyber victims.

Instruments

Three instruments were employed to measure the students' levels of cyberbullying behavior, cyber victimization, and the effects on anxiety as well as self-esteem. These instruments were the Cyberbullying and Cyber Victimization Subscale, Anxiety Scale and Self-esteem Scale. The three instruments were translated into Malay language for the samples which match with culture in Malaysia context as it was mother tongue in the country.

Cyberbullying and Cyber Victimization Subscales

The Cyberbullying and Cyber Victimization Subscales were used to measure levels of cyberbullying behaviour and cyber victimization among secondary school students. Both subscales were taken from the Cyberbullying and Cyber Victimization Experiences Questionnaire, developed by Antoniadou et al. (2016). There were a total of eight items in both subscales. Both subscales collected responses through five-point Likert Scale. These Subscales were highly reliable, with similar Cronbach's alpha coefficient values at α =.86. Results of Confirmatory Factor Analysis (CFA) showed that cyberbullying was a two-factor construct (cyberbullying behavior and cybervictimization) (Antoniadou et al., 2016).

Anxiety Scale

Anxiety scale in this study was used to measure anxiety level of secondary school students after involvement in cyberbullying or cyber victimization. It was gauged by the Interaction Anxiousness Scale (IAS), developed by Leary (1983). The 12-item scale was adapted from the original instrument, which also measured face-to-face interaction, beyond virtual interaction as researched in this study. There were eight positive items and four negative items respectively in the instrument. Data from this instrument was collected through five-point Likert Scale. The scale was found to be a reliable instrument, with a Cronbach's alpha value of α=.79. CFA analysis has confirmed that the instrument was uni-dimensional and valid for adolescents (Subasi, 2013).

Self-esteem Scale

Self-esteem of cyberbullies and cyber victims was measured by the Self-esteem Scale, which was adopted from the Rosenberg Self-esteem Scale (RSES) (Rosernberg, 1965). The 10-item scale collected responses using five-point Likert Scale. There was five positive items and five negative items in the scale. This reliability of instrument was well established with Cronbach's alpha value of α=0.79, while its validity had been established across difference age group. Based on CFA analysis, self-esteem was found to be a unidimensional construct, as supported by past studies (e.g., Pullman & Allik, 2000; Tomas & Oliver, 1999). Data for this study were analyzed using Two-way ANOVA to determine the effects of gender (male, female) and level of cyberbullying behavior (low, moderate, high) on the psychology well-being (anxiety, self-esteem) of secondary school students.

Results

Table 1 shows that both male (M=1.82; S.D.=.44) and female respondents (M=1.82; S.D.=.58) with high level of involvement in cyberbullying had highest mean score in anxiety. Similarly, male (M=1.66; S.D.=.57) and female (M=1.71; S.D.=.67) victims with high level of cyber victimization have also recorded highest mean value in anxiety. This indicates that the higher is the involvement of students as cyber bullies and cyber victims, the higher is the anxiety experienced by cyberbullies and cyber victims.

The results also revealed that respondents with high level of cyberbullying behavior had lower mean score for self-esteem. This trend was observed for both males (M=2.15; S.D.=.51) and females (M=1.88; S.D.=.59). Those with high level of cyber victimization also had lower self-esteem as shown by both males (M=2.14; S.D.=.58) and females (M=1.71; S.D.=.84). The results of descriptive analysis seem to suggest higher involvement in cyberbullying and cyber victimization will results in more negative self-esteem for both cyberbullies and cyber victims.

Table 1
Statistics According to Gender and Levels of Cyberbullying.

Psychological Well-being		Male		Female	
1.Anxiety	Levels of Cyberbullying	M	S.D	M	S.D
	Low	1.28	.40	1.54	.48
	Moderate	1.42	.44	1.65	.44
	High	1.82	.44	1.82	.58
	Levels of Cyber Victimization	M	S.D	M	S.D
	Low	1.23	.39	1.46	.50
	Moderate	1.40	.50	1.62	.45
	High	1.66	.57	1.71	.67
2. Self-Esteem	Levels of Cyberbullying	M	S.D	M	S.D
	Low	2.45	.60	2.19	.62
	Moderate	2.27	.70	2.04	.51
	High	2.15	.51	1.88	.59
	Levels of Cyber Victimization	M	S.D	M	S.D
	Low	2.51	.63	2.30	.58
	Moderate	2.23	.66	2.03	.63
	High	2.14	.68	1.71	.84

Two-Way ANOVA on Levels of Cyberbullying Behavior and Gender on Cyberbullies' Anxiety

As showed in Figure 2 and Table 2, there result of two-away ANOVA shows that there was no significant interaction effects between levels of cyberbullying behavior and gender on anxiety of cyberbullies [F (2, 315) =.72, p>.05, partial eta squared=.01]. Hypothesis H1 was not supported. However, the main effects of levels of cyberbullying [F(2, 315) =9.14, p<.05, partial eta squared =.05] and gender [F(1, 315) =3.90, p=.05, partial eta-squared =.01] were

significant. Both H1(a) and H1(b) were supported. This implies that levels of cyberbullying behavior and gender differences could influence anxiety of cyberbullies separately.

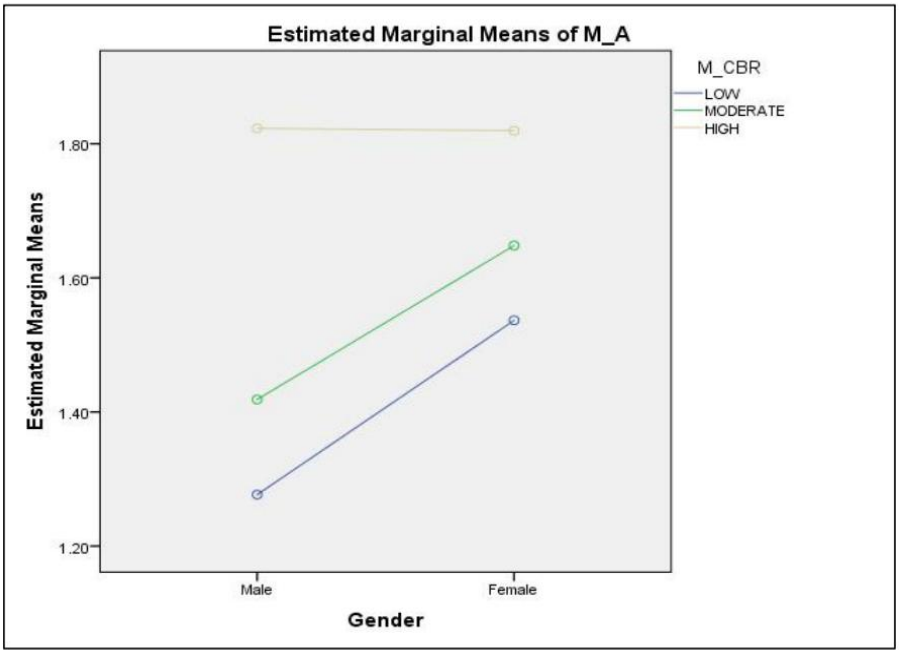


Figure 2: Effects of Levels of Cyberbullying Behaviour and Gender on Anxiety of Cyberbullies

Table 2
Effects Levels of Cyberbullying Behavior and Gender on Anxiety of Cyberbullies.

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta-Square
Gender	.79	1	.79	3.90	.05*	.01
Levels of CB	3.71	2	1.86	9.14	.00*	.05
Gender * Levels of CB	.29	2	.15	.72	.49	.01
Error	63.99	315	.20			
Total	765.40	321				

Note. *p≤.05

Two-Way ANOVA on Levels of Cyberbullying Behavior and Gender on Cyberbullies' Self-esteem
As showed in Figure 3 and Table 3, the results of two-way ANOVA revealed that there were no significant interaction effects between levels of cyberbullying behavior and gender on cyberbullies' self-esteem [F (2, 315) =.01, *p*>.05, partial eta squared =.00]. Hypothesis H2 was not supported. There was also no significant main effect from levels of cyberbullying [F(2, 315) =2.82, *p*>.05, partial eta squared=.02] on self-esteem, suggesting that $H2_{(a)}$ was also not supported. Gender, however, was found to have a significant main effect on self-esteem of cyberbullies [F(1, 315) =4.94, *p*<.05, partial eta-squared =.02]. $H2_{(b)}$ was supported. This suggest that gender differences could influence cyber bullies' self-esteem separately.

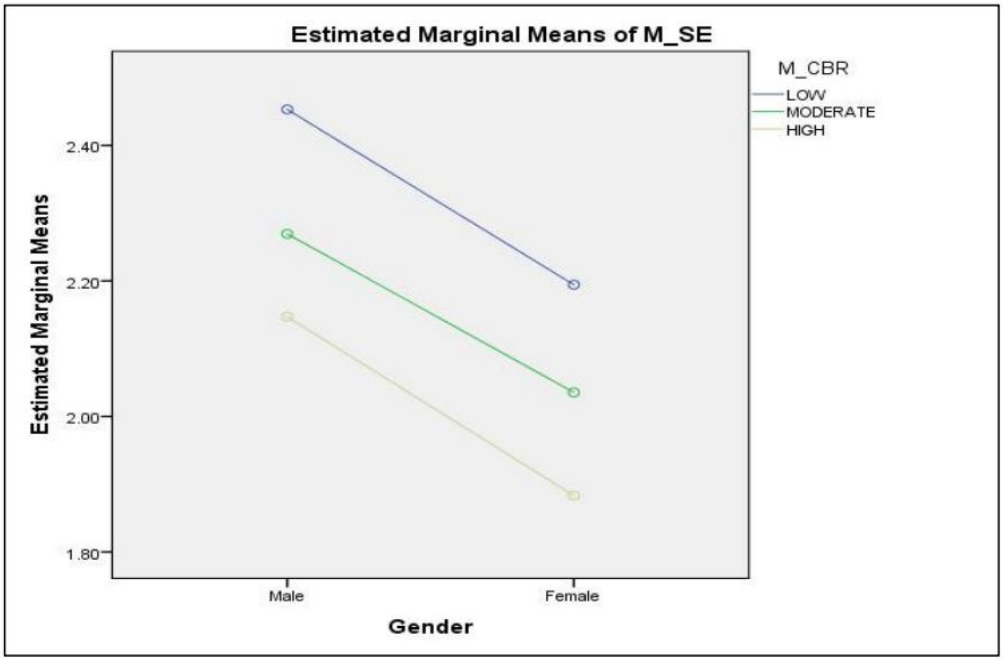


Figure 3: Effects of Levels of Cyberbullying Behaviour and Gender on Self-esteem of Cyberbullies

Table 3
Effect of Levels of Cyberbullying Behavior and Gender on Self-Esteem of Cyberbullies

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender	1.74	1	1.74	4.94	.03*	.02
Levels of CB	1.99	2	.10	2.82	.06	.02
Gender * Levels of CB	.01	2	.00	.01	.99	.00
Error	111.22	315	.35			
Total	1777.10	321				

Note. *p≤.05

Two-Way ANOVA on Levels of Cyber Victimization and Gender on Cyber Victims' Anxiety
The result of two-away ANOVA (Figure 4 and Table 4) revealed that there was no significant interaction effect between levels of cyber victimization and gender on the anxiety of the cyber victims [F (2, 358) =.62, *p*>.05, partial eta squared=.00]. Hypothesis H3 was not supported. However, separately levels of cyber victimization [F (2, 358) =9.85, *p*<.05, partial eta squared =.05] and gender [F(1, 358) =7.26, *p*<.05, partial eta-squared =.02] have significant main effects on anxiety. Both H3(a) and H3(b) were supported. This indicates that levels of cyber victimization and gender differences could influence the anxiety of cyber victims separately.

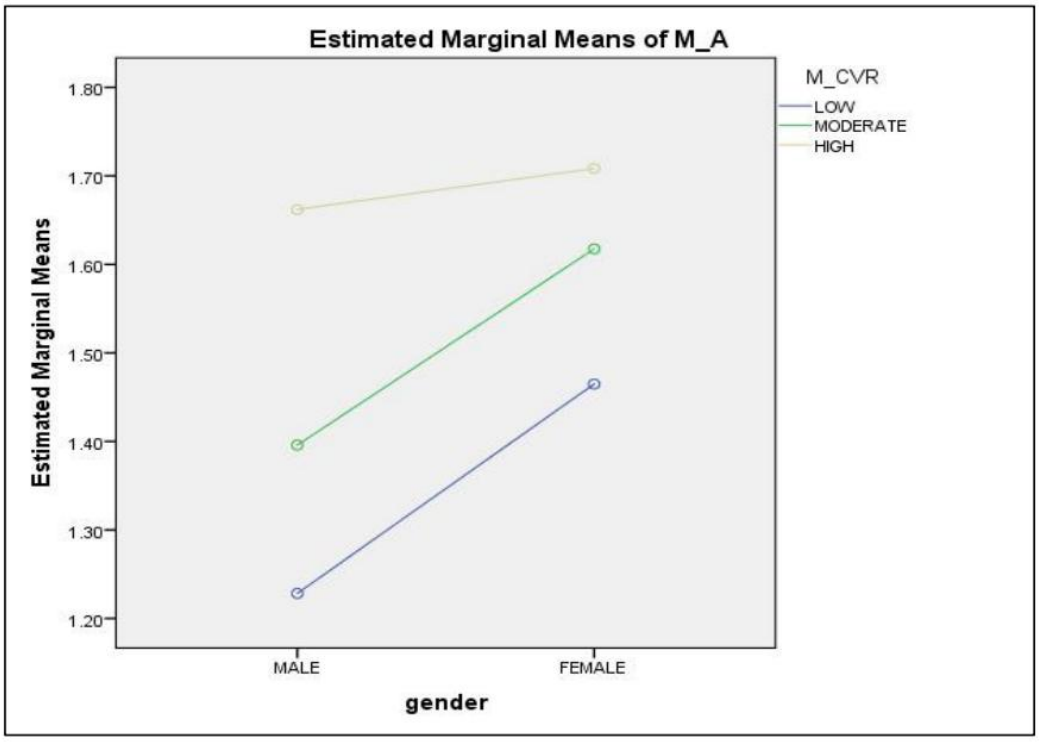


Figure 4: Effects of Levels of Cyber Victimization and Gender on Anxiety of Cyber Victims

Table 4
Effects of Levels of Cyber Victimization and Gender on Anxiety of Cyber Victims

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender	1.57	1	1.57	7.26	.01*	.02
Levels of CV	4.27	2	2.13	9.85	.00*	.05
Gender * Levels of CV	.27	2	.13	0.62	.54	.00
Error	77.50	358	.22			
Total	845.30	364				

Note. *$p \leq .05$

Two-Way ANOVA on Levels of Cyber Victimization and Gender on Self-esteem of Cyber Victims
The results of two-away ANOVA (Figure 5 and Table 5) revealed that there was no significant interaction effect between levels of cyber victimization and gender on the self-esteem of the victims [F (2, 358) =.49, p>.05, partial eta squared=.00]. Hypothesis H4 was not supported. Levels of cyber victimization [F(2, 358) =9.02, p<.05, partial eta squared =.06], however, had significant main effects on self-esteem. Hypothesis H4(a) was supported. The main effect of gender on cyber victims' self-esteem was as also found to be significant [F(1, 358) =4.29, p<.05, partial eta-squared=.03]. Hypothesis H4(b) was supported as well. This results indicated that self-esteem experienced by cyber victims can be affected by levels cyber victimization and gender differences separately.

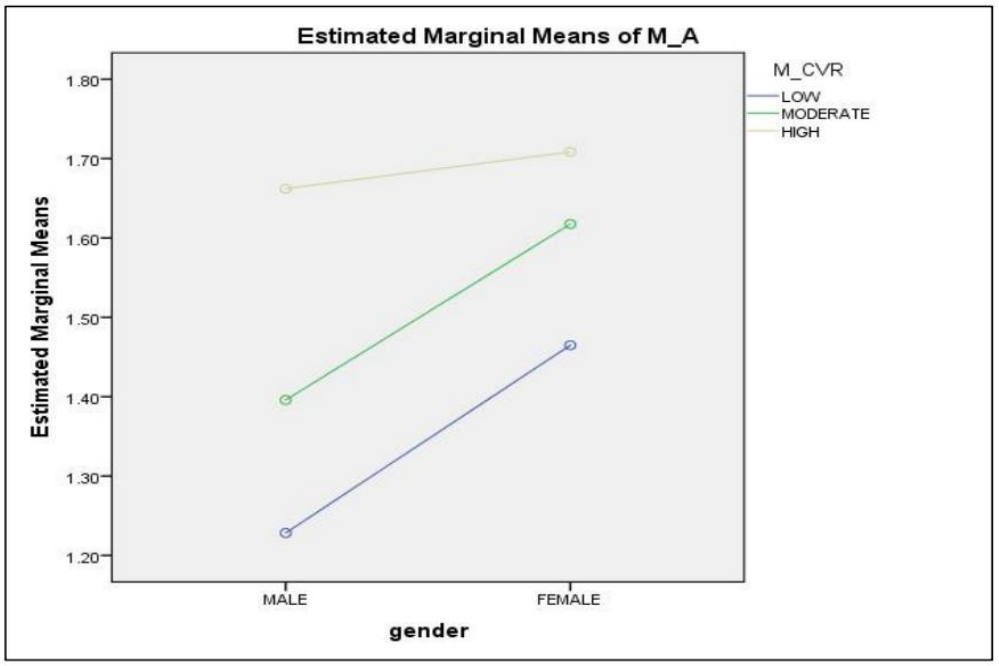


Figure 5: Effects of Levels of Cyber Victimization and Gender on Self-esteem of Cyber Victims

Table 5
Effects of Levels of Cyber Victimization and Gender on Self-Esteem of Cyber Victims

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Gender	4.29	1	4.29	10.49	.00*	.03
Levels of CV	10.00	2	5.00	12.24	.00*	.06
Gender * Levels of CV	.40	2	.20	0.49	.61	.00
Error	149.46	358	.41			
Total	2040.23	364				

Note. *$p \leq .05$

Discussion

This study aimed to determine the interactions and main effects of levels of cyberbullying and gender on anxiety as well as self-esteem of cyberbullying. It also attempted to test the interaction and main effects of levels of cyber victimization and gender on both anxiety and self-esteem of cyber bullies. Two-way ANOVA found that there were no significant interaction effects in all the hypotheses tested. Levels of cyberbullying/cyber victimization and gender could influence cyberbullies and cyber victims' psychological well-being separately.

This study found that levels of cyberbullying behavior and gender differences could influence anxiety of cyber bullies separately. However, their self-esteem was affected by levels of cyberbullying only; not affected by gender differences.

Levels of Cyberbullying Behavior and Gender Effects on Anxiety of Cyberbullies

Anxiety refers to the feelings of uneasiness, worries and fear (Zhang et al., 2020). In this study, anxiety is the anxious feelings experienced by the cyberbullies, which include their state of uneasiness, worries and fear when cyberbullying others online. There were no interaction effects between levels of cyberbullying and gender. The effects of level of cyberbullying on anxiety, however, was significant. In other words, levels of cyberbullying matters as it can cause anxious feelings among cyberbullies (Palermiti et al., 2016; Shin & Ahn, 2015).

In other words, cyberbullies' mental health can be affected their level of cyberbullying. This suggests that when students are frequently involved in cyberbullying, their anxiety level increases (Myers & Cowie, 2017; Peled, 2019). These feelings might be due to fear of being caught and punish by the school (Delgado et al, 2019). Counselors, teachers, school administrators and parents should be aware of the adverse effects of cyberbullying on cyberbullies as well. Cyberbullying is a social phenomenon that not only negatively affect the victims, but also the bullies. There are needs to closely monitor students who have a history of cyberbullying or are at risks of involving in cyberbullying (Helfrich et al., 2020; Hendry et al., 2023).

The significant main effect of gender on anxiety of cyberbullies suggests that there were gender differences in fear experienced by cyberbullies where female cyberbullies endure higher levels of anxiety than male cyberbullies (eg. Almenayes, 2017; Myklestad & Straiton, 2021; Safaria, 2016).

They were afraid of being caught and face retaliation from their victims via online. They were also anxious about they may face disciplinary actions such as dismissal or getting into serious legal trouble Since they have violated the school codes. (Delgado et al., 2019).

Levels of Cyberbullying Behavior and Gender Effects on Self-Esteem of Cyberbullies

Self-esteem of cyberbullies refers to how they perceive themselves. This self-evaluation can affect one's emotional and behavioral adjustment (Al-Hendawi, 2022). Insignificant interaction effects between level of cyberbullying and gender were found. There was also no significant main effect of levels of cyberbullying behavior. This shows that levels of cyberbullying have no direct effect on cyberbullies' self-esteem (e.g., Balakrishnan & Gan, 2018; Brack & Caltabiano, 2014; National Children's Bureau, 2016; Nia Agustiningsih et al., 2024). The way cyberbullies perceived themselves were not influenced by their levels of cyberbullying. It could be that regardless of levels of cyberbullying, cyberbullies tend to feel good about themselves (Cuncic, 2021).

Main effect of gender, however, was found on cyberbullies' self-esteem, indicating male and female cyberbullies have different self-evaluation (Hao et al., 2020). The effects of cyberbullying were found to be more negative for female cyberbullies compare to males. Males usually developed higher self-esteem in social situations compared to females even in cyberbullying behaviors (Brack & Caltabiano, 2014; Nupur & Mahapatrro, 2016). Involvement of male bullies in cyberbullying could be reinforced their sense of superiority and power against the cyber victims (Hawkins, 2018).

Levels of Cyber Victimization and Gender Effects on Anxiety of Cyber Victims

Anxiety of cyber victims refers to the feelings of anxiousness such as excessive worry, stress and over sensitive towards the surroundings. No significant interaction effects between levels of cyber victimization and gender was found. This implies that gender differences could affect the anxiety experienced by cyber victims regardless of the extend of victimization. Different anxiety level was commonly experienced by males and female cyber victims, which suggest that significant effect of gender was in line with past studies (e.g., Chao & Yu, 2017 ; Sasson & Mesch, 2017, Zhong et al., 2021). Female cyber victims experienced higher level of anxiety compared to male cyber victims aligned with majority of past studies (e.g., Gigori & Maftei, 2020; Safaria et al.,2016; Sincek et al., 2017; Livazovic & Ham, 2019; Rodríguez-Domínguez et al., 2020). Cyberbullying is more worse than physical bullying because cyber victims might avoid friends as well as social activities and escaped himself from the society (Mahanta & Khatoniyar, 2019). Female cyber victims are more anxious because of their sense of defenseless when being bullied online (Gourdon, 2021; Peled, 2019). They are more likely to feel lonely and withdrawn as victims compared to the male counterparts (Naaz & Dewan, 2022; Svendsen, 2024).

There was significant main effects of cyber victimization on anxiety. This finding implies that the more serious is the effects of victimization, the higher is the anxiety experienced by cyber victims. This is in line with several past findings that cyber victims' level of victimization was correlated with their anxiety level (e.g, The Children's Society U.K. & YoungMinds, 2018; Jenaro et al., 2021). Past research also discovered that cyberbullying has adverse effects on adolescents as they are still growing mentally and physically in the time being (Mahanta & Khatoniyar, 2019).

In fact, repeated cyber victimization increases the anxiety of cyber victims (Martínez-Monteagudo, et. al., 2020). It is necessary for parents and relevant stakeholders to keep track of students who fall victims to cyberbullying, especially female victims who suffer higher rates of anxiety (Helfrich et al., 2020; Hendry et al., 2023).

Levels of Cyber Victimization and Gender Effects on Self-Esteem of Cyber Victims

Self-esteem describes cyber victims self-value and perceived self-worth when they became victim of bullying. Adolescence is one of the most sensitive periods of life in terms of self-esteem processes that are normally involved in their developmental phase (Palermiti et al., 2022). It is important to discover whether different domains of self-esteem can be specifically linked with different forms of aggressive behaviour (Bartolo et al., 2019).

The insignificant interaction effects between cyber victimization and gender suggest that both of these factors do not interact. Levels of victimization and gender alone could influence cyber victims' self-esteem. In terms of levels of victimization, the more students became victims of cyberbullying, the lower is their self-esteem (e.g., Beghin, 2020; Brewer & Kerslake, 2015; Palermiti et al., 2016).

The main effects of gender suggest that there were gender differences in self-esteem of cyber victims. Females cyber victims tend to have lower self-esteem than males (eg., Nupur & Mahapatrro, 2016; Reigner et al., 2022; Stark et al., 2018). This is because they tend to experience more intense emotional issues and would exhibit lower self-esteem compared to

males (Romero-Reignier et al., 2022; Vasanthi et al., 2024). Parents, educators and counselors should be aware of the effects of cyber bullying on female victims' self-esteem. They needed more attention to cope with the lower self-esteem when experiencing cyber victimization (Helfrich et al., 2020; Hendry et al., 2023).

Conclusion

In conclusion, this study shed lights on the interaction effects between gender and levels of cyberbullying on adolescents' anxiety and self-esteem. Overall, the gender and levels of cyberbullying had no significant interactions effects on anxiety nor self-esteem. In other words, level of cyberbullying has the same effects on both female and male. Regardless of gender, students with higher level of cyberbullying and cyber victimization are more anxious and they also have lower self-esteem. On the opposite, those with lower level of involvement in cyberbullying had more positive self-esteem and lower level of anxiety. The impact of cyberbullying on students' psychological well-being should be made known to the relevant stakeholders (Bashir et al., 2021; Helfrich et al., 2020; Hendry et al., 2023). With the increasing influence of the Internet and social networking sites especially among adolescents, incidences of cyberbullying are expected to increase, hence the need for treatment and intervention programme are demanded for both cyberbullies and cyber victims (Mahanta & Khatoniyar, 2019). It is important to address cyberbullying issues among school students. The importance of developing prevention and intervention strategies are also being emphasized to develope in order to combat cyberbullying in schools (Yirci et al., 2021). Reducing their involvement in cyberbullying is a direct measure that could promote more positive mental health among students. Literature reviews suggests that the establishment of school policy on prevention of cyberbullying, mental health support and intervention are among the strategies that could be implemented at schools (Ruiz, 2018). To combat cyberbullying, schools need to support teachers' actions and provide some guidance of the possible actions that can be taken to address the concern of cyberbullying (Benghin, 2020).

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