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Affective and Cognitive Responses to Distress: the 'A' And 'C' Components of I-Pace Model Hypothesized to Explain the High Prevalence of Internet Gaming Disorder in Africa

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Abstract

Background: *Internet use is basic part of contemporary people's lives globally and it's being used for education, business, and leisure. However, the use of internet has become addictive behavior for some to the point that internet gaming disorder became an emerging diagnosis in DSM-5. Based on the available statistics and fact, Africa has the lowest internet users and penetration rates, yet she has the highest prevalence of internet gaming disorder. This concerns trigger the researcher to seek for answer to the question of why the phenomenon is high in Africa continent. Therefore, this study hypothesized that affective and cognitive responses to distress are reasons for high prevalence of IGD in Africa.*

Methods: *This study was a web-based cross-sectional survey of 728 eligible respondents who assented to participate via google form. The samples were drawn from four major regions in Africa; Eastern Africa (416, 57.1%), Western Africa (129, 17.7%), Southern Africa (93, 12.8%) and Northern Africa (90, 12.4%). Researcher-generated socio-demographic questionnaire and Internet Gaming Disorder Scale-Short Form (IGDS9-SF) were used to collect data from the participants.*

Results: *Results from this study implied that higher rate of IGD in africa was found to be associated with unbearable level of hardship (p=0.012), unbearable level of hardship in African countries (p=0.011), high level of stress (p=0.002), and that internet gaming is one way to cope wih life stress and it is tested significant to precipitate the high rate of IGD in Africa (p=0.001).*

Conclusion: *The study concluded that level of hardship in Africa and high level of stress are keys to high rate of IGD in Africa; hence, African leaders are challenged to alleviate hardship and stress in Africa, this will help African youths to make use of their time meaningfully.*

Keywords: I-Pace Model, Affective And Cognitiv Responses, Distress, Prevalence, Internet Gaming Disorder, Africa

Introduction and Background

The American Psychiatric Association (APA) proposed the Internet gaming disorder to be included in the future revision of the Diagnostic Statistics of Mental Disorder (DSM) as a potential psychiatric disorder. This disorder is presented with impaired control over gaming behaviour, and it is characterized by increasing the priority of internet gaming over other activities of interest despite the occurrence of negative consequences and significant distress associated with gaming behaviour. In view of the scanty epidemiological data, validity, and cross-cultural data about the proposed disorder, the APA had called for basic research to explore the prevalence, validity and cross-cultural reliability of the IGD [1].

In response to the call for research, several studies had been done to estimate the prevalence of IGD globally [2]. For example, found the prevalence of IGD among college students in USA at 1.25%, another study [3] among primary school students in Europe found the prevalence at 5.9% and among adolescents in seven European countries at 1.6% [4]. Statistics on adolescents internet gaming disorder in Asian countries were higher than US and European's prevalence of IGD. A meta-analysis on the prevalence of IGD in Southeast Asia for example showed the prevalence rate of IGD at 20% [5]. Another prevalence study on IGD in Bangladesh, South Asia a high rate of 28.6% (Hassan, Alam, Wahab, & Hawlader, 2020). Prevalence among Chinese adolescents found the proportion at 17% in South Korea, it was found to be at 21.6% [6, 7].

Meanwhile, statistics on African adolescents on IGD was reported to be higher than the rest of the world. A study by among adolescents from 9 African countries such as Rwanda, Gabon, Nigeria, Morocco, Tunisia, Senegal, Ivory Coast and South Africa found the prevalence of IGD at 30%. Another study in Tunisia showed that 37.4% of Tunisian adolescents had IGD [8]. In fact, a study in Nigeria showed the prevalence of IGD at 51% [9]. In light of available data on prevalence of IGD, it is therefore indicated that the proprotion of this newly proposed disorder is higher in Africa compared to the rest of the world. This higher prevalence is a concern for the researcher because the world internet usage and population statistics (2021) revealed that USA has the highest internet penetration at 90.8% compared to Europe at 88.2%, Asia at 63.8% and Africa at 43.2%. Africa was reported to have the lowest internet penetration rate in the world, yet the prevalence of internet gaming disorder was higher in Africa as opposed the rest of the world. Similarly, 2019 world internet users statistics indicated that Europe has highest internet users at 82.5%, followed by Americans at 77.2%, then commonwealth independent states 72.2%, Arab states at 51.6%, Asia and Pacific at 48.4%, then Africa with the lowest rate of internet users at 28.2% ("Measuring digital development: Facts and figures 2019", 2020). Based on the available statistics and fact, Africa has the lowest internet users and penetration rates, yet she has the highest prevalence of internet gaming disorder. This concerns trigger the researcher to seek for answer to the question of why the phenomenon is high in Africa continent.

Similar to this data as reported by, the latest data from the census 2019 by the Kenya National Bureau of Statistics (KNBS) reveals that Kenya has a youthful rural population, that 35.7 million Kenyans, which translated to 75.1% are below 35 years, out of which 68.9% live in rural areas. As regards having assessed the smartphones, laptops and the internet, reports that there were 21.75 million internet users in Kenya as of January 2021 and internet penetration in Kenya stood at 40% in January 2021. Statistics indicated that Kenya with a population of almost 55millions has the highest internet users in Africa at 85.2% compared to Nigeria, the most populous African county with a population of about 210 million at 73%. Also, another report indicated that Kenyan internet users aged 16 to 64 spend an average of four hours and 58 minutes using mobile internet each day and 62.6% of the users live in Nairobi county and 74% of all web traffic comes from a mobile device, and almost 25% from laptops and desktops, where 1% comes from tablets. These data are of great concerns to the researcher.

Therefore, this study proposed to explore why Africa with the lowest internet users and penetration in the world will have the highest prevalence of internet gaming disorder in the world. Meanwhile, in attempt to find answer to this research question, this researcher hypothesized that the I-PACE theory by might provide answers to why the prevalence was higher in Africa compared to the rest of the world. Especially the A and C component of the model explains that the affective and cognitive responses to external or internal stimuli are responsible to the emergence of IGD. Theorists are of opinion that the level of perceived psychological stress, perceived life situations, perception or personal interpretation of life situations results in affective and cognitive responses, which in turn link to the level of perceived stress may influence whether or not individuals decide to use the internet to cope. In response to this theory, argued that one of the major tools for coping with stressful life events is internet use. Another study conceptualizes internet use disorders as a coping strategy for everyday stressful life experiences. Theorized that the decision to use internet games was a sequel to the affective and cognitive responses to both internal and external stimuli. Therefore, this present study aim to test the validity of this theory and to examine whether this theory can explain why the prevalence of IGD is higher in Africa

Methodology

This study was a web-based cross-sectional survey where a total of 728 eligible respondents who assented to participate was recruited into the study via google form. The sample size was calculated using Yamane (1967) sample size formula with the confidence level at 95% and margin error of 5%. The samples for this study was spread across four major regions in Africa such as Eastern Africa (416, 57.1%), Western Africa (129, 17.7%), Southern Africa (93, 12.8%) and Northern Africa (90, 12.4%). The method of data collection was both quantitative and qualitative using both numerical scores and open-ended questions. The respondents must be 10 years and above, must be an African from any of the main African regions and must give assent to informed consent to participate in the study. This study utilized a socio-demographic questionnaire, opinion index on assumed reasons why prevalence of IGD was high in Africa and standardized instrument such as the nine-item Internet Gaming Disorder Scale-Short Form (IGDS9-SF) to collect data from the participants. IGDS9-SF is one of the most popular instruments developed based on DSM-5 to assess gaming addiction globally and the instrument was developed to assess and diagnosed gaming disorders across cultures [10]. IGD is discriminated against by the endorsement of at least five core symptoms out of nine over a period of 12 months [11]. Total scores can be obtained by summing up all responses to the 9 items of the instrument and it can range from a minimum of 9 to a minimum of 45 points, with higher scores being indicative of a higher degree of IGD. In order to differentiate disordered gamers from non-disordered gamers, the respondents must have endorsed at least 5 criteria out of the nine by answering 5 'Often' or 'Very Often', which translates as endorsement of the 5 criterion.

All submitted e-questionnaires were re-entered into SPSS version 23 for analysis using both descriptive and inferential statistics. Ordinal by Ordinal Kendall's tau-b Spearman correlation test, Chi-Square and Analysis of variance (One-way ANOVA) was used to anlyzed the data collected from the respondents.

Results

Table 1: Response Rates

Respondents	No of declined respondents	No of ineligible respondents (underaged)	Total eligible respondents
730	1 (0.14)	1 (0.14)	728 (99.73)

Table 1 presents the response rate. 730 respondents attempted the online questionnaire, out of which 1 respondent, consituted 0.1% declined to participate in the study and 1 (0.1%) respondents was disqualified from participating because he was underaged. The total eligible respondents were 728, constituted to 99.7 response rate. The age mean was 25.5 ± (SD: 8.55).

Table 2: Background Distribution of Key demographic characteristics

Variables	Frequency	Percent
Participant's Age		
10-22	363	49.9
23-30	209	28.7
31-40	113	15.5
41+	43	5.9
Participant's Gender		
Male	464	63.7
Female	264	36.3
African Region		
Northern Africa	90	12.4
Southern Africa	93	12.8
Western Africa	129	17.7
Eastern Africa	416	57.1
Self-perceived family economic status		
Very poor	29	4.0
Poor	102	14.0
Average	524	72.0
Rich	54	7.4
Affluent	19	2.6
Self-perceived family functionality		
Very functional	258	35.4
Averagely functional	352	48.4
Chaotic/dysfunctional	78	10.7
Cant tell	40	5.5

Table 2 presents the background distribution of socio-demographic characteristics of the respondents. As regards age categories, distribution of respondents aged 10-22 years was higher (363, 49.9%) compared to 23-30 years (209, 28.7%), 31-40 (113, 15.5%) and 41+ (43, 5.9%). Also, distribution of male respondents was higher (464, 63.7%) as opposed female counterpart (264, 36.3%). Similarly, frequency of respondents from eastern Africa was higher (416, 57.1%) compared to Western Africa (129, 17.7%), Southern Africa (93, 12.8%) and Northern Africa (90, 12.4%). As regards, the respondent's self-perceived family economic status, distribution of respondents who perceived their family economic status to be average was higher (524, 72%) compared to Poor (102, 14%), rich (54, 7.4%) very poor (29, 4% and affluent (19, 2.6%). In addition, distribution of respondent's self-perceived family functionality shows that the frequency of respondents who perceived their family averagely functional was higher (352, 48.4%) compared to very functional (258, 35.4%), chaotic/dysfunctional (78, 10.7%) and those who can't tell (40, 5.5%).

Table 3: Prevalence of Internet Gaming Disorder

Variables	Frequency	Percent
Non disordered gamers	516	70.9
Non-internet gaming users	49	6.7
Internet gaming disorder	163	22.4
Total	728	100

Table 3 shows the prevalence of internet gaming disorder among the respondents. The respondent's scores on IGDS9-SF indicated that the frequency of non-disordered gamers was higher (516, 70.9%) as opposed to non-internet gaming users (49, 6.7%) and internet gaming disorder (163, 22.4%). Therefore, the prevalence of IGD among african respondents was 22.4%. Affective and cognitive responses to distress: the 'A' and 'C' components of I-PACE model hypothesized to explain the high prevalence of internet gaming disorder in Africa using the Ordinal by Ordinal Kendall's tau-b Spearman correlation and ANOVA to test the hypothesis of opinions.

Table 4: Opinion 1: My country Ccn be classified as a Developing Country Assumed to Precipitate IGD

Variable	Total %	Internet Gaming Condition		Ordinal by Ordinal Kendall's tau-b Spearman correlation		
		NDG	IGD	Value	df	Sig
Agreed	533 (73.2)	418 (57.4)	115 (15.8)	.026	2	.480
Neutral	143 (19.6)	105 (14.4)	38 (5.2)			
Disagreed	52 (7.1)	42 (5.8)	10 (1.4)			

Table 4 shows the Ordinal by Ordinal Kendall's tau-b spearman correlation to explain the descriptive distributions of opinion index of the respondents on the opinion that 'my country can be classified a a developing country hence it precipitate the emergence of IGD. Frequency of respondents who agreed to the assumption was higher at 15.8% ompared to the respondents who were neutral to the opinion at 5.2% and disagreed at 1.4%. Kendall's tau-b Spearman correlation test indicated that respondent's opinion on being a developing country does not correlate with IGD (p =0.480).

Table 5: ANOVA Table Testing the Hypothesis of Opinion 1

			Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	(Combined)	Unweighted	.057	1	.057	.156	.693
	Linear Term	Weighted	.057	1	.057	.156	.693
			.057	1	.057	.156	.693
Within Groups			267.139	726	.368		
Total			267.196	727			

The ANOVA Table in Table 5 assumed that Africa is classified as a developing country that this is assumed to precipitate the high rate of IGD in Africa. As shown on the Table, there was no significant different in the mean of respondents opinion and IGD scores. This implies that the assumption is rejected (p=0.693). The can be interpreted that opinion of the respondents that classification of Africa being a developing country does not explain why IGD rates in Africa is high.

Table 6: Opinion 2- The Quality of Life in My Country is Low Assumed to Precipitate IGD

		Internet Gaming Condition		Ordinal by Ordinal Kendall's tau-b Spearman correlation		
Variable	Total	NDG	IGD	Value	df	Sig
Agreed	304 (41.8)	238 (32.7)	66 (9.1)	.052	2	.167
Neutral	312 (42.9)	252 (34.6)	60 (8.2)			
Disagreed	112 (15.4)	75 (10.3)	37 (5.1)			

Table 6 presents the opinion index of the respondents on the assumption that the quality of life in my country is low, and this is assumed to precipitate the high rate of IGD in Africa. Out of 304 (41.8%) respondents who agreed to the assumption, 32.7% had non-disordered gaming whereas, 9.1% had internet gaming disorder. In the same way, out of 312 (42.9%) who were neutral to the opinion, 34.6% had non-disordered gaming and 8.2% were presented with internet gaming disorder. Out of the respondents who disagreed 112 (15.4%), 10.3% had non-disordered gaming whereas, 5.1% had internet gaming disorder. Kendall's tau-b Spearman correlation test indicated that there was no correlation between the respondent's opinion on the low quality of life in Africa countries and IGD (p=0.167).

Table 7: ANOVA Table Testing the Hypothesis of Opinion 2

			Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	(Combined) Linear Term	Unweighted	1.547	1	1.547	3.087	.079
Within Groups			1.547	1	1.547	3.087	.079
			1.547	1	1.547	3.087	.079
			363.816	726	.501		
Total			365.363	727			

The ANOVA Table in Table 7 assumed that the low quality of life in Africa is assumed to precipitate the high rate of IGD in Africa. As shown on the Table, there was no significant different in the mean of respondents opinion and IGD scores. This implies that the assumption is rejected (p=0.679). The can be interpreted that opinion of the respondents that low quality of life in Africa does not explain why IGD rates in Africa is high.

Table 8: Opinion 3- The Level of Hardship in my Country is Unbearable for Everyone Assumed to Precipitate IGD

Variable	Total	Internet Gaming Condition		Ordinal by Ordinal Kendall's tau-b Spearman correlation		
		NDG	IGD	Value	df	Sig
Agreed	211 (29.0)	151 (20.7)	60 (8.2)	-.088	2	.012
Neutral	267 (36.7)	210 (28.8)	57 (7.8)			
Disagreed	250 (34.3)	204 (28.0)	46 (6.3)			

Table 8 shows the descriptive analysis of respondent's opinion on the level of unbearable hardship in Africa hypothesized to precipitate IGD. Out of 211 constituted to 29% of the total respondents who agreed to the hypothetical statement, 20.7% had non disordered gaming, whereas, 8.2% had Internet gaming disorder. Out of the 36.7% of the respondents who were neutral on the opinion, 28.8% were considered to have non-disordered gaming as opposed to 7.8% of the respondents to have diagnosed with internet gaming disorder. As regards 250 (34.3%) who disagreed, 28% were non-disordered gaming, whereas, 6.3% were diagnosed with internet gaming disorder. Ordinal by ordinal Kendall's tau-b Spearman correlation test indicated that there was a statistical correlation between higher rate of internet gaming disorder in Africa and opinion of the respondents on the unbearable level of hardship in Africa (p = 0.012).

Table 9: ANOVA Table Testing the Hypothesis of Opinion 3

			Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	(Combined)		4.085	1	4.085	6.520	.011
	Linear Term	Unweighted	4.085	1	4.085	6.520	.011
		Weighted	4.085	1	4.085	6.520	.011
Within Groups			454.826	726	.626		
Total			458.911	727			

Table 9 presents the ANOVA testing the assumption that the unbearable level of hardship in Africa countries precipitates the high rate of IGD in Africa. As shown on the Table, there was a significant difference in the mean of respondents opinion and IGD scores. This implies that the assumption is accepted (p=0.011). The can be interpreted that opinion of the respondents that unbearable level of hardship in Africa is responsible for the high rates of IGD in Africa.

Table 10: Opinion 4 - The level of Frustration and Stress Among Youths is High in My Country Assumed to Precipitate IGD

		Internet Gaming Condition		Ordinal by Ordinal Kendall's tau-b Spearman correlation		
Variable	Total	NDG	IGD	Value	Df	Sig
Agreed	534 (73.4)	420 (57.7)	114 (15.7)	.044	2	.234
Neutral	151 (20.7)	115 (15.8)	36 (4.9)			
Disagreed	43 (5.9)	30 (4.1)	13 (1.8)			

Table 10 presents the descriptive analysis of respondent's responses to opinion 4 that the high level of frustration and stress among youths was responsible for the high rate of IGD in Africa. Out of 534 (73.4%) who agreed to the assumption, 420 (57.7%) presented with non disordered gaming, whereas 114 (15.7%) were diagnosed with internet gaming disorder. The Table also showed that 151 (20.7%) respondents were neutral to the assumption, out of which 115 (15.8%) were non disordered gamers and 36 (4.9%) were diagnosed with internet gaming disorder. In addition, out of 43 (5.9%) respondents who disagreed with the opinion, 30 (4.1%) were non disordered gamers while 13 (1.8%) were diagnosed with internet gaming disorder. Kendall's tau-b Spearman correlation test indicated that there was no significant correlation between the respondent's opinion index and internet gaming disorder (p=0.234). ANOVA Table.

Table 11: ANOVA Table Testing the Hypothesis of Opinion 4

			Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	(Combined)		.631	1	.631	1.869	.172
	Linear Term	Unweighted	.631	1	.631	1.869	.172
		Weighted	.631	1	.631	1.869	.172
Within Groups			245.214	726	.338		
Total			245.845	727			

Table 11 shows the ANOVA testing the assumption that the high level of frustration and stress among youth in Africa precipitates the high rate of IGD. As shown on the Table, there was no significant difference in the mean of respondents opinion and IGD scores. This implies that the assumption is rejected (p=0.172). The means that high level of frustration and stress among youths is not responsible for the high rates of IGD in Africa.

Table 12: Opinion 5 - The Stress and Hardship in My Country are Higher than that of other Developed Country Assumed to Precipitate IGD

		Internet Gaming Condition		Ordinal by Ordinal Kendall's tau-b Spearman correlation		
Variable	**Total**	**NDG**	**IGD**	**Value**	**df**	**Sig**
Agreed	397 (54.5)	297 (40.8)	100 (13.7)	-.046	2	.208
Neutral	220 (30.2)	186 (25.5)	34 (4.7)			
Disagreed	111 (15.2)	82 (11.3)	29 (4.0)			

Table 12 shows the descriptive analysis of the responses of the respondents on the higher stress and hardship in Africa compared to other developed countries in the world to responsible for the high rates of PGD. The Table indicates that out of 397 (54.5%) who agreed with the assumption, 297 (40.8%) were non disordered gamers, whereas 100 (13.7%) were diagnosed with internet gaming disorder. Out of 220 (30.2%) of the respondents who were neutral on the opinion, 186 (25.5%) of them were non disordered gamers while 34 (4.7%) of them were presenting with internet gaming disorder. Similarly, from 111 (15.2%) of the respondents who disagreed with the opinion, 82 (11.3%) of them were non disordered gamers whereas, 28 (4%) were presenting with IGD. Ordinal by Ordinal Kendall's tau-b Spearman correlation test shows that there was no significant correlation between the respondent's opinion and high rates of IGD in Africa (p=0.208). This impliess that higher stress and hardship in Africa are not responsible for the high rates of PGD. ANOVA Table.

Table 13: Anova Table Testing the Hypothesis of Opinion 5

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		.383	1	.383	.704	.402
	Linear Term	Unweighted	.383	1	.383	.704	.402
		Weighted	.383	1	.383	.704	.402
Within Groups			395.259	726	.544		
Total			395.643	727			

Table 13 shows the ANOVA testing the assumption that the high stress and hardship in Africa compared to other developed countries in the world precipitates the high rate of IGD. As shown on the Table, there was no significant difference in the mean of respondents opinion and IGD scores. This implies that the assumption is rejected (p=0.402). The means that assumption that the high stress and hardship in Africa compared to other developed countries in the world precipitates the high rate of IGD is rejected.

Table 14: Opinion 6 - When Stress Levels are High, people do other Things to Cope With the Stress Assumed to Precipitate IGD

		Internet Gaming Condition		Ordinal by Ordinal Kendall's tau-b Spearman correlation		
Variable	**Total**	**NDG**	**IGD**	**Value**	**df**	**Sig**
		476 (65.4)	119 (16.3)	.127	2	.002
Agreed	595 (81.7)	62 (8.5)	22 (13.5)			
Neutral	84 (11.5)	27 (3.7)	22 (13.5)			
Disagreed	49 (6.7)					

Table 14 presents the descriptive analysis of respondent's responses to opinion 6 that When stress levels are high, people do other things including internet gaming to cope with the stress assumed to precipitate IGD. Out of 595 (81.7%) who agreed to the assumption, 476 (65.4%) presented with non disordered gaming, whereas 119 (16.3%) were diagnosed with internet gaming disorder. The Table also showed that 84 (11.5%) respondents were neutral to the assumption, out of which 62 (8.5%) were non disordered gamers and 22 (13.5%) were diagnosed with internet gaming disorder. In addition, out of 49 (6.7%) respondents who disagreed with the opinion, 27 (3.7%) were non disordered gamers while 22 (13.5%) were diagnosed with internet gaming disorder. Kendall's tau-b Spearman correlation test indicated that there was a significant correlation between the respondent's opinion index and internet gaming disorder (p=0.002).

Table 15: ANOVA Table Testing the Hypothesis of Opinion 6

			Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	(Combined)		5.040	1	5.040	15.946	.000
	Linear Term	Unweighted	5.040	1	5.040	15.946	.000
		Weighted	5.040	1	5.040	15.946	.000
Within Groups			229.460	726	.316		
Total			234.500	727			

Table 15 shows the ANOVA testing the assumption that when stress levels are high, people do other things including internet gaming to cope with the stress assumed to precipitate IGD. As shown on the Table, there was a significant difference in the mean of respondents opinion and IGD scores. This implies that the assumption is accepted (p=0.000). The means that assumption that When stress levels are high, people do other things including internet gaming to cope with the stress accepted to precipitate the high rate of IGD in Africa.

Table 16: Opinion 7 - Internet Gaming is one way to Cope with Life Stress Assumed to Precipitate IGD

		Internet Gaming Condition		Ordinal by Ordinal Kendall's tau-b Spearman correlation		
Variable	Total	NDG	IGD	Value	df	Sig
Agreed	537 (73.8)	415 (57.0)	122 (16.8)	-.014	2	.004
Neutral	132 (18.1)	103 (14.1)	29 (4.0)			
Disagreed	59 (8.1)	47 (6.5)	12 (1.6)			

As regards the respondents' opinion on internet gaming is one way to cope with life stress and assumed to precipitate IGD, Table 16 presents the descriptive analysis of respondent's responses to the opinion. Out of 537 (73.8%) who agreed to the assumption, 415 (57%) presented with non disordered gaming, whereas 122 (16.8%) were diagnosed with internet gaming disorder. The Table also showed that 132 (18.1%) respondents were neutral to the assumption, out of which 103 (14.1%) were non disordered gamers and 29 (4%) were diagnosed with internet gaming disorder. In addition, out of 59 (8.1%) respondents who disagreed with the opinion, 47 (6.5%) were non disordered gamers while 12 (1.5%) were diagnosed with internet gaming disorder. Kendall's tau-b Spearman correlation test indicated that there was a significant correlation between the respondent's opinion index and internet gaming disorder (p=0.004).

Table 17: Anova Table Testing the Hypothesis of Opinion 8

			Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	(Combined)		.070	1	.070	.180	.001
	Linear Term	Unweighted	.070	1	.070	.180	.001
		Weighted	.070	1	.070	.180	.001
Within Groups			282.078	726	.389		
Total			282.148	727			

Table 17 reports the ANOVA, testing the assumption that internet gaming is one way to cope with life stress and it is assumed to precipitate IGD. As shown on the Table, there was a significant difference in the mean of respondents opinion and IGD scores. This implies that the assumption is accepted (p=0.001). The means that assumption that internet gaming is one way to cope with life stress and it is assumed to precipitate the high rate of IGD in africa.

Table 18: Opinion 8 - Internet Gaming is a Good Coping Strategy for Stressful Situation Assumed to Precipitate IGD

		Internet Gaming Condition		Ordinal by Ordinal Kendall's tau-b Spearman correlation		
Variable	Total	NDG	IGD	Value	df	Sig
Agreed		314 (43.1)	101 (13.9)	-.035	2	.334
Neutral	415 (57.0)	158 (21.7)	32 (4.4)			
Disagreed	190 (26.1)	93 (12.8)	30 (4.1)			

Table 18 presents the descriptive analysis of respondent's responses to the opinion that internet gaming is a good coping strategy for stressful situation and it is assumed to precipitate the high rates of IGD in Africa. Out of 415 (57%) who agreed to the assumption, 341 (43.1%) presented with non disordered gaming, whereas 101 (13.9%) were diagnosed with internet gaming disorder. The Table also showed that out of 190 (26.1%) respondents that were neutral to the assumption, 158 (21.7%) were non disordered gamers and 32 (4.4%) were diagnosed with internet gaming disorder. In addition, out of 123 (16.9%) respondents who disagreed with the opinion, 93 (12.8%) were non disordered gamers while 30 (4.1%) were diagnosed with internet gaming disorder. Kendall's tau-b Spearman correlation test indicated that there was no significant correlation between the respondent's opinion index and internet gaming disorder (p=0.334).

Table 19: Anova Table Testing the Hypothesis of Opinion 8

			Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)		.250	1	.250	.431	.512
	Linear Term	Unweighted	.250	1	.250	.431	.512
		Weighted	.250	1	.250	.431	.512
Within Groups			420.629	726	.579		
Total			420.879	727			

Table 19 reports the ANOVA, testing the assumption that internet gaming is a good coping strategy for stressful situation and it is assumed to precipitate high rates of IGD in Africa. As shown on the Table, there was no significant difference in the mean of respondents opinion and IGD scores. This implies that the assumption is rejected (p=0.512). The means that assumption that internet gaming is a good coping strategy for stressful situation can not be used to explain why the prevalence of IGD is high in Africa compared to other developed countries in the world.

Discussion

Overall, the result from this present study indicated that the prevalence of internet gaming disorder in Africa was 22.4%. This finding was lower than the previous findings by among adolescents from 9 African countries: Rwanda, Gabon, Nigeria, Morocco, Tunisia, Senegal, Ivory Coast and South Africa who found the prevalence of IGD at 30%. Also, finding from this present study was lower than the result from another study among Tunisia adolescents at 37.4%. The result from this study was also in contrast significantly with a study in Nigeria where the prevalence of IGD was found to be at 51%. However, it must be noted that this present study was not mainly among adolescents but adults. On any case, 22.4% prevalence of IGD from this study was still significantly higher than overall prevalence of IGD in the world at 3.05% [12]. Additionally, 22.4% prevalence from this study was significantly higher than that of USA at 1.25%, and European countries at 5.1% [13]. Meanwhile, prevalence result from this study was very close to the prevalence of IGD in Asia. For instance, a meta-analysis on the prevalence of IGD in Southeast Asia showed the prevalence rate of IGD at 20%. Similar study in Bangladesh, South Asia showed a high rate of 28.6%. A study in South Korea also found the prevalence of IGD at 21.6%. As regards socio-demographic characteristics and the distribution of prevalence of IGD, this study found that the proportion of IGD was higher among the respondents aged 10-22 years at 14.3%, and male respondents at 13.5%. This findings from this presentstudy are consistent to a study in China where severity of IGD was found among children aged 10.9 years on average and that boys had significantly higher IGD risk than girls [14]. Also found higher prevalence of IGD among male participants at 7.6% as opposed 2.5% among female counterpart and that participants aged 10-29 years were at higher at risk [15]. Similar study also support the aforementioned findings [16].

As regards risk and protective factors of internet gaming disorders in Africa, this present study found that respondents from Western Africa (AOR: 3.26; 95% CI: 1.963-5.411), respondents whose family economic status was considered to be very poor (AOR: 1.68; 95% CI: .465-6.072), and respondents who perceived their family functionality chaotic/dysfunctional (AOR: 2.83; 95% CI: 1.051 – 7.602) were indicated to be at risk of internet gaming disorder. These findings from this study were consistent with available data from previous empirical studies on risk factors of IGD. For instance, found low family economic status as one of the risk factors of IGD among adolescents. In another logistic regression analysis, dysfunctional family, functional and dysfunctional impulsivity was found to be risk factors of IGD among adolescents [17]. Also, a study found that dysfunctional family environment is instrumental to the development of IGD and that family function, parent-child relationships, childhood maltreatment, bullying and cyberbullying modulates the development of IGD [18]. Moreover, results from this present study showed that being female (AOR: .93; 95% CI: .631-1.368), Average family economic status (AOR: .80; 95% CI: .276-2.328) and rich family economic status (AOR: 79; 95% CI: .240 – 2.652) were protective factors in this present study. Similarly argued that adolescents whose family economic status are stable are unlikely to engage in internet gaming activities. Rho and colleagues are however noted that studies on protective factors of IGD are limited.

Furthermore, this study sought to test the affective and cognitive responses to distress, the 'A' and 'C' components of I-PACE model to explain the high prevalence of IGD in Africa. Results from this study showed that there was a significant correlation between the opinion that unbearable level of hardship in Africa and IGD scores among the respondents. The ANOVA, testing the hypothesis indicated that the hypothetical statement of unbearable level of hardship in Africa is found to be responsible for the high rates of IGD in Africa (p=0.011). Also, finding from this study also showed a significant correlates of the assumption that when stress levels are high, people do other things including internet gaming to cope with the stress and the respondent's scores on IGD. The ANOVA statistics test indicated that high levels of stress precipitate the high rate of IGD in Africa (p=0.000). In addition, this study found a significant correlates of opinion that internet gaming was one way to cope with life stress and the respondent's scores on IGD. The ANOVA test showed that significantly, internet gaming was one way to cope with life stress and it explains why the proportion of IGD is high in Africa (p=0.001).

The findings from this study cuncur with the theory as postulated by that perception or personal interpretation of perceived psychological distress are instrumental in the decision to use the internet [19]. This interpretation of life hardship, and stress result in affective and cognitive responses, which in turn link to influence whether or not individuals decide to use the internet to cope with the associated cognitions and effects as prompted by the level of psychological stress. Finding from this present study in addition with the Brand et al's theory, are in consistent with findings from another study by, where it was argued that one of the major tools for coping with stressful life events is internet use and that experiencing stress in daily life is significantly contributing to the emergence of internet use disorder [20]. Also added that IGD was a coping strategy for everyday stressful life experiences [21].

Conclusion

Findings from this present study indicate that prevalence of Internet Gaming Disorders was indeed high in Africa and that high prevalence was sequel to unbearable hardship and stress level in Africa [22-28]. This result confirms that internet gaming is affective and cognitive responses to distress as postulated in I-PACE model. African leaders are therefore challenged to alleviate the level of hardship and stress levels in Africa. More studies are also needed to recommend effective ways to intervene and prevent youths from this addictive behavior.

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