

Prevalence of Pathological Internet Use among Adolescents in Secondary Schools: A Case of Ruthimitu Mixed and Dagoretti Mixed Sub-County Secondary Schools in Nairobi County, Kenya

Kimaru Nyaga, Ph.D. in Clinical Psychology Candidate; Alice Munene, Psy.D; & Michael Bowen, Ph.D., Daystar University

Abstract

Internet use is an integral part of our daily undertakings; but, Internet use may become pathological and harmful in some cases. Pathological Internet use (PIU) lures adolescents away from school tasks that require resilient mental effort so they can spend their lives on social networks or virtual betting/gaming. PIU, also referred to as Internet addiction, insistently triggers adolescents to use internet-enabled gadgets at the expense of engaging with family, and other vital real-life activities. In Kenya epidemiological studies on secondary school adolescent samples with Internet use disorder or pathological use of Internet are lacking. Yet, understanding the prevalence of PIU is paramount in devising appropriate treatment. The objective of this study was to establish the prevalence of PIU among students in selected secondary schools in Dagoretti Sub-county, Nairobi County. Two self-administered measures were used; a socio-demographic questionnaire and Problematic and Risky Internet Use Screening Scale (PRIUSS). Data was collected from 360 adolescents who were screened for PIU symptoms using PRIUSS. Data were analyzed using SPSS software. This study found that the prevalence of PIU among respondents was 74.4%. The proportion was higher among males at 42.9% compared to females at 31.5%. The frequency was more among respondents aged 17-19 at 54.6% than those aged 14-16 at 43.5% and 20-22 at 1.9%. This meant that the male students used Internet in a more pathological manner than their female peers. However, both genders are at risk of becoming pathological Internet users. Therefore, appropriate prevention programs and treatment for those affected are vital, especially in secondary schools. Enhancements in family relations and stricter parental supervision, especially when mothers have active job employment, are also recommended.

Keywords: Pathological, internet, prevalence, adolescence, intervention, addiction

Introduction and Background

One of the highly regarded technological advancements which are embraced by people of all ages in our digitalized world is Internet (Maraz, Király & Demetrovics, 2015). The invention of

Internet and its development was intended for information exchange and research purposes. However, Internet use has infiltrated other aspects of life such as education, entertainment, health tips seeking, shopping and above all, personal communication. For this reason, Internet use has become inevitable for the contemporary society (Non-Communicable Diseases Watch, 2015). In 2017, a national based study revealed that there are 1.2% adolescents ranging between 10 to 19 years actively using Internet in the world compared to 27% of older people at the aged 54 years. Another report by the World Internet Users Statistics showed that adolescents and young people used Internet actively compared to the rest of the people. As for the adolescents, Internet use is something much more than just an ordinary ambition to be online (Wallace, 2014). Although this is a trend that has been viewed in the general population, in a special way, adolescents adopt new technologies quickly (World Health Organization (WHO, 2015). Probably, this is because adolescence as a transitional phase comprises of substantial changes in physical, social and psychological attributes (Zaky, 2016). Equally, during this crucial transient phase of adolescence, relationship with peers, family and society experience divergent alterations. The adolescents explicitly show the desire for independence particularly in decisions, emotions and behavioral dimensions (WHO, 2015). During the same period, some social skills in adolescents develop within various learning settings of psychosocial interactions.

Although Internet use is a daily life involvement for most young people, it can cause serious impairment to the individual and their interpersonal relations. Overuse of Internet triggers the release of dopamine, which is a powerful neurotransmitter involved in reward, attention, and addiction. A burst of dopamine does not just cause a good feeling to adolescents. It has been proved to re-wire the user's behavior and habits (Freed, 2018). PIU, also referred to as Internet addiction, currently does not have consensual definition and its criteria is still lacking (vanRooij & Prause, 2014; APA, 2013). However, PIU has emerged as a universal issue, compelling numerous international scholars to come to an agreement that PIU has an adverse impact on major life domains in interpersonal relations and emotional enhancement. It is defined as an impulse-control disorder of Internet use that is associated with addiction-like symptoms (Griffiths et al., 2016).

Considerable debate has been happening as to whether PIU is an addiction in itself (Griffiths & Szabo, 2014; Pontes, Szabo, & Griffiths, 2015). The DSM-V did not include PIU as an

independent disorder. Researchers have postulated that it fits in the behavioral or process addiction category (Rumpf et al., 2015); but this still remains a contentious issue in the psychotherapy realm. Griffiths (2010, 2015) stated that we have to differentiate between dependence on the Internet, and dependence to the Internet. Griffiths' view was that most people presenting with PIU usually use it as a medium to accelerate additional addictive behaviour such as cybersex addiction. Numerous terms have been used to address this pathological behaviour (Tokunaga & Rains, 2016). These terms include pathological Internet use, Internet dependency, problematic Internet use, dysfunctional Internet use, compulsive Internet use or Internet addiction and "excessive" virtual addiction (Wallance, 2014; Griffiths et al., 2016). This study adopted the term PIU as it describes the essence of the phenomenon, while excluding the concept of dependency or disorder. That is, other than the behaviour being excessive, problems related to the Internet use are also anticipated to be in existence (Pontes, Szabo, & Griffiths, 2015).

Various psychosocial problems among adolescent are clearly linked to PIU, regardless of heterogeneity, with indicators such as social impairment, emotional impairment, and risky/impulsive Internet use (Aghamolaei & Tavafian, 2013). Over 90% of secondary school students spend the better part of the day at school, which is a central abode for evolving steady interaction with other adolescents. Therefore, schools are able to provide a serene environment for imparting a healthy lifestyle for adolescents (Non-Communicable Diseases Watch, 2015).

In Kenya, there are very few studies focusing on Internet overuse, and the available ones mainly targeted adults and university student samples. Similarly, in contrast to the abundance of studies in adult populations, the researcher found no study focusing on the prevalence of PIU among the adolescent subpopulation in local secondary schools. This, perhaps, is due to the challenges regarding the diagnostic criteria and the heterogeneous nature of the disorder. Although there are numerous studies reporting Internet use in adolescent and student samples across the continent and in Kenya, the researcher did not find any study that investigated the prevalence of PIU among adolescent in secondary schools. Since it is evident that PIU has serious consequences among adolescents in regard to physical and mental health, understanding of PIU prevalence was found pertinent. Therefore, this study sought to evaluate the PIU prevalence in the selected secondary schools in Dagoretti Subcounty, Nairobi.

Methodology

The current study was carried out in selected secondary schools in two constituencies of Dagoretti Sub-county, Nairobi County. The two schools are located in different constituencies, but with similar characteristics. The two constituencies host a cosmopolitan population, which live in semi-urban regions with a few of the residents of Dagoretti South mainly engaging in subsistence farming while majority of those in Dagoretti North are mainly practicing small and medium enterprises. For this reason, most of the parents can afford to provide Internet enabled devices to their sons and daughters. The area also has numerous cybercafés and betting joints which are always populated by youth or adolescents, most of whom are students from the local secondary schools in the area.

The study was executed using quasi-experimental design to establish the PIU prevalence among adolescents in the selected secondary schools, in Dagoretti Subcounty, Nairobi. The two constituencies of Dagoretti Subcounty have a large cosmopolitan population, which was found suitable for this study. Dagoretti Subcounty was purposively selected since it has the greatest number of public secondary schools in Nairobi County (MoEST & UNICEF, 2014). Two schools were purposively selected as they were mixed-day secondary schools with students with similar socio-demography. Besides, respondents had similar socio-economic backgrounds. The sampled schools had a total population of 1597 students. Dagoretti Mixed Secondary School with 775 students and Ruthimitu Mixed Secondary School with 822 students (MoEST, 2014). Respondents included in the study were those aged 14-22, in form 2 and form 3 classes; who were present and gave their assent. The study was conducted among a total of 360 adolescents in the two classes who were screened for PIU symptoms, of which 212 (59.1%) males and 147 (40.9%) females.

To conform to the set ethical principles, the researcher ensured that the study was approved by the Daystar University Ethics Review Board (DU-ERB) and National Commission for Science, Technology and Innovation (NACOSTI). The required coordination was also done with the Ministry of Education, Science and Technology and Dagoretti Sub-County Directorate of Education. Informed consent was obtained from relevant school authority figures who represented parents while informed assent was granted by the respondents. Confidentiality and anonymity of the respondents was ensured in data handling, analysis and publication of the research findings.

Data collection was conducted using a research developed socio-demographic questionnaire to capture characteristics such as gender, age, class, religion, academic performance, frequency of Internet usage and the settings from which Internet was accessed. The standardized test used in the study was the Problematic and Risky Internet Use Screening Scale (PRIUSS). In this study, only respondents in forms 2 and 3 classes, aged 14-22, were present and gave their assent, were considered to fill the PRIUSS set of questions. Therefore, respondents having one or more missing values on key sociodemographic questionnaire items such as age and gender were not included.

Problematic and Risky Internet Use Screening Scale includes 18 items and 3 subscales: i) Social Impairment (items 1–6); ii) Emotional Impairment (items 7–11); iii) Risky/Impulsive Internet Use (items 12–18). The range of the scores is from 18 to 96, where higher scores indicate a greater level of PIU. A score of ≤ 25 points was considered to mean ‘not at risk of PIU’ while a score of >25 was considered to mean ‘at risk of PIU. The instrument has shown good structural and construct validity in total score (good-of-fit .89, root mean square error of approximation 0.07, and strong factor loadings (range 0.61–0.82), as well as good reliability (Boubeta, Salgado, Folgar, Gallego, & Mallou, 2015).

After obtaining all the necessary authorization, the researcher sent questionnaires and other documents to the selected school principals for verification. These aided in the signing of letters related to students’ participation in the research. Besides, general information related to students’ population and meeting schedule was acquired. Then, the required coordination was done in each school with the principals. Thereafter, each student completed the socio-demographic questionnaire and the PRIUSS. The study was aided by four research assistants who were recruited, inducted and trained for some days. The research assistants’ level of education was post graduate; and they worked closely with the principal researcher throughout the study. The principal researcher trained the assistants on how to administer the research instruments and also accustomed them to the questionnaire, research problem, research design, motivational enhancement therapy and ethical considerations.

Data analysis was done using Statistical Package for Social Science (SPSS) version 24. For the processing of statistical output and construction of tables and graphs the researcher used Microsoft Excel. The descriptive and inferential statistics were generated and a chi-square test of

independence was used to determine statistical association. A p-value ≤ 0.05 (less or equal to 0.05) was considered statistically significant.

Results

Table 1: Frequency of Key Demographic Characteristics and Pathological Scale Scores

		Pathological Internet Scale Scores		Chi-Square Test		
Variable	Total %	< 25 = Non-pathological	> 26 = Pathological users	X ²	df	Sig.
Respondents' Gender						
Male	212 (59.1)	58 (16.2)	154 (42.9)	.815	1	.367
Female	147 (40.9)	34 (9.5)	113 (31.5)			
Respondents' Age						
14-16	156 (43.5)	41 (11.4)	115 (32.0)	.107	2	.948
17-19	196 (54.6)	49 (13.6)	147 (40.9)			
20-22	7 (1.9)	2 (0.6)	5 (1.4)			
Respondents' Level of Education						
Form 2	176 (48.9)	46 (12.8)	130 (36.1)	.061	1	.806
Form 3	184 (51.1)	46 (12.8)	138 (38.3)			
Respondents Religious Affiliation						
Catholics	112 (31.1)	26 (7.2)	86 (23.9)	3.268	5	.659
Anglican	57 (15.8)	17 (4.7)	40 (11.1)			
Pentecostal	97 (26.9)	21 (5.8)	76 (21.1)			
Adventist	28 (7.8)	10 (2.8)	18 (5.0)			
Muslim	11 (3.1)	3 (0.8)	8 (2.2)			
Others	55 (15.3)	15 (4.2)	40 (11.1)			
Occupation of Respondents' father						
Not employed parents	100 (27.8)	21 (5.8)	79 (21.9)	6.244	4	.182
Casuals or menial jobs	59 (16.4)	19 (5.3)	40 (11.1)			
Farmer or Agri. Activities	10 (2.8)	1 (0.3)	9 (2.5)			
Self-employed or Business	114(31.7)	35 (9.7)	79 (21.9)			
Professionals (office) jobs	77 (21.4)	16 (4.4)	61 (16.9)			
Occupation of Respondents' Mother						
Not employed parents	104 (28.9)	26 (7.2)	78 (21.7)	1.659	4	.798
Casuals or menial jobs	62 (17.2)	18 (5.0)	44 (12.2)			
Farmer/Agri. activities	11 (3.1)	4 (1.1)	7 (1.9)			
Self –employed/ Business	135 (37.5)	34 (9.4)	101 (28.1)			
Professionals (office) jobs	48 (13.3)	10 (2.8)	38 (10.6)			
Respondents' school						

Ruthimitu Mixed Sec. Sch.	180 (50.0)	45 (12.5)	135 (37.5)	.058	1	.809
Dagoretti Mixed Sec. Sch.	180 (50.0)	47 (13.1)	133 (36.9)			

Table 2: Distribution of Respondents' Socio-Demographic Characteristics and Pathological Scale Scores at Baseline (N=360)

Variable	Total %	Pathological Internet Scale Scores		Chi-Square Test		
		< 25 = Non-pathological	> 26 = Pathological users	X ²	df	Sig.
Respondents' school						
Ruthimitu Mixed Sec. Sch.	180 (50.0)	45 (12.5)	135 (37.5)	.058	1	.809
Dagoretti Mixed Sec. Sch.	180 (50.0)	47 (13.1)	133 (36.9)			
Respondents' Academic Performance						
Above average	47 (13.1)	10 (2.8)	37 (10.3)	2.786	2	.248
Average	254 (70.0)	62 (17.2)	192 (53.3)			
Below Average	59 (16.4)	20 (5.6)	39 (10.8)			
Whom respondent is living with						
Both Biological Parents	209 (58.1)	65 (18.1)	144 (40.0)	10.29	5	0.67
Adopted Parents	3 (0.8)	1 (0.3)	2 (0.6)	9		
Single Parents	102 (28.3)	18 (5.0)	84 (23.3)			
Guardian/Foster Parents	12 (3.3)	1 (0.3)	11 (3.1)			
Grandparents	5 (1.4)	2 (0.6)	3 (0.8)			
Others relatives	29 (8.1)	5 (1.4)	24 (6.7)			

Table 2 presents distribution of PIU by respondents' socio-demographic characteristics and pathological scale scores. The respondents who scored equal or less than 25 in PRIUSS were considered to be at risk of pathological Internet use whereas those who scored equal or greater than 26 were considered to be non-pathological users. In terms of gender distribution, the prevalence of PIU was higher among males at 59.1% as opposed to females at 40.9%. The frequency of male pathological Internet users was higher at 42.9% than the female pathological users at 31.5%. This meant that the male students used Internet in a more pathological manner compared to their female peers in terms of prevalence. The prevalence of PIU by age distribution revealed that adolescents aged 17-19 scored higher on pathological user category (40.9%) compared to adolescents aged 14-16 years (32.0%) and those aged 20-21 years (1.4%) on

pathological user. This observation suggested that the PIU prevalence was higher among the younger students.

The prevalence of PIU was highest among form three students at 38.3% while it was at 36.1% among form 2 students. This is an indication that the prevalence of PIU decreased in the lower classes, that is, among form two respondents in comparison to respondents from the form three classes. This may imply that the proportion of adolescents who are pathological users went higher with the advance in classes. This particular phenomenon could be explained by the fact that form two students were slightly younger than those in form three, nevertheless, they all seem to have greater exposure and hence, their PIU is influenced by peer relations, mental predisposition and free access of Internet in school and at home.

As regards the frequency of the pathological users within the religious affiliation, among the Catholics, 23.9% of them were pathological users. Among the Pentecostals, 21.1% were pathological users while among the Anglican, 11.1% were pathological users. Others were 5.0% among the Adventist and 2.2% among the Muslim. This suggested that respondents within Catholic and Pentecostal affiliations had a higher prevalence of PIU as opposed to those in other affiliation groups. The distribution of occupation of respondents' parents, indicated that the adolescents whose parents were not employed and self-employed adversely contributed a higher percentage to the PIU at 21.9% than the adolescents whose parents are employed as professionals at 16.9%. Additionally, those that worked as casuals/menial employees were at (11.1%) while those who were farmers or engaged in agricultural activities were at 2.5%. Given that majority of the respondents came from families where both biological parents are present or living together, this seems to indicate that the parental status, in terms of marital status, had a positive contribution in the Internet use pathological behaviour of the respondents.

Adolescents living with both biological parents likewise contributed a higher percentage (40%) to the PIU compared to those from other family settings such as living with adopted parents (0.6%), single parents (23.3%), guardian/foster parents (3.1%) and grandparents (0.8%); all combined at 27.8%. The socio-demographic characteristics are summarized in Table 2.

Discussion

PIU is increasingly becoming an issue among adolescents. This study sought to establish the prevalence of PIU among students in the selected secondary schools and consider PIU in relation to the socio-demographic characteristics of the respondents. The above results indicate that the PIU prevalence of the respondents was 74.4%. Essentially, this study prevalence finding was slightly higher than for findings from other global studies examining adolescents' PIU prevalence which ranged between 14-55% in Europe (Laconi et al., 2018), 19-51% in Asia (Mak et al., 2014), and 00-00% in Africa. However, the findings were somewhat within the range of prevalence estimates observed in similar studies evaluating general Internet use (Kayastha et al., 2018) among secondary school adolescents. This may be due to the similar socio-economic settings, and the fact that the schools studied were day public schools. This aligns with findings of a study by the National Council for Population and Development (2017) which found that adolescent learners in day schools are vulnerable to mental health issues, owing sometimes to poor parental support, family negative and peer pressure. In the Kenyan context, recently, there has been a rigorous effort of installing WiFi in all public schools as a way of promoting computer literacy and digitalization. There has also been an inflow of persuasive techniques influencing adolescents' brain, particularly, video games. Better than anything else in the contemporary society, online gaming seems to be delivering rewards to people especially the adolescents. Besides, the National Institute of Mental (2016) stated that digital technology mostly affected the cosmopolitan population especially adolescent learners living in semi-urban areas and struggling with various life stressors such as financial instability, academic output among other intrapersonal and interpersonal issues.

Globally, much of PIU focus has been in countries where Internet penetration and usage is high, such as China and South Korea believed to have the highest prevalence rate ranging between 21.3% and 68.0% (Clark, 2018). So far, limited attention is being paid to Africa where Internet usage rates are among the world's fastest growing. Epidemiological studies on PIU have reported variations in prevalence world-wide. Studies in technologically advanced countries have shown a lower prevalence of PIU than those in the emerging economies. For instance, in Europe, the prevalence of PIU ranged between 14% and 55%. These findings are according to a large scale study, involving German, French, Spanish, Polish, Turkish, Hungarian, Greek and English

adolescent samples (Laconi et al., 2018). Prevalence rates indicated by findings from the current study are slightly higher than those reported from other countries. Another study was conducted in six Asian nations, and the researchers (Mak et al., 2014) reported varied prevalence rate among the adolescents as follows: The prevalence of PIU in Japan was 48%, and in South Korea the prevalence rate was reported to be 53% among secondary school students. The prevalence of problematic and risky Internet use among high school students in the Philippines was reported to be 51% (Mak et al., 2014). In Bangladesh, the prevalence of PIU among adolescents was at 37.5% while Malaysian adolescent students in urban localities had the lowest (18.7%) PIU prevalence among adolescent students in urban localities (Mak et al., 2014).

In African countries, data on PIU is scarce, unlike in Western and developed Asian countries. Consequently, across the continent there are no stringent measures to control the use of Internet to protect susceptible subpopulations such as adolescents. The WHO (2019) and Kuo (2016) reported that although there is not much data on Internet addiction in Africa, most of the mental health issues in the region are Internet related. This could be an indication that PIU has not been addressed with the seriousness it deserves in Africa. Similarly, there are no stringent policy measures related to cyber security that could warrant Internet users to become responsible and in return protected. For this reason, PIU in African countries may be manifesting itself differently. In Uganda and Namibia, a study conducted in 2013 found that while students spent less time online than their Western peers, they exhibited more instances of emotional dependency and mood modification behavior like choosing to interact online over real-time interaction (Kuo, 2016). This implies that PIU among African students could be best characterized by their strong emotional dependence on the Internet; hence clinical diagnosis need not just focus on the obvious measures such as amount of time spent online.

In Kenya, the semi-urban communities have experienced emergence of numerous cybercafés and betting joints which are usually populated by school going adolescents most of whom are of the age range between 14-22 years. This is an indication that PIU is more likely to occur in places with higher access to the Internet and other ICT services. Besides geographical location, there is growing evidence that sociocultural factors, such as gender, age, family setting and socioeconomic status, could greatly impact the development of PIU (Kuss, Griffiths, Karila, & Billieux, 2014). Basically, gender and age are an imperative determinant because adolescent PIU

behaviour has a tendency to fade out in time. With regard to the gender and age, male students were more prone to PIU in some (Ching et al., 2017, Çuhadar, 2012, Kheirkhah, Ghabeli, & Gouran, 2010), but not all (Fernandez et al., 2015; Ni, Yan, Chen, & Liu, 2009) studies. In this study the prevalence rate among males and the respondents aged 17-19 years had a higher prevalence in comparison to the females and adolescents aged 14-16 and 20-22 years.

Other studies have established that as opposed to other age groups, adolescents are more likely to have PIU (Yu & Shek, 2013). According to the present study results, gender and PIU had no statistical significant association. However, the results indicated that the prevalence of PIU was higher among male respondents at 42.9% than the female respondents who had PIU at 31.5%. Results from this study were consistent with other studies, where male adolescents were postulated to be more susceptible to PIU (Shek & Yu, 2013; Yu & Shek, 2013; Adiele & Olatokun, 2014). For instance, this study concurs with Adiele and Olatokun (2014) who conducted a study on prevalence of Internet addiction in Nigeria and found that male adolescents were more likely to be dependent on Internet than their female counterparts. In a similar study conducted among secondary school students from selected countries (Simcharoen et al., 2018), the report of the survey showed that the prevalence of PIU in Thailand was higher among males at 54.0% compared to females (41.2%), in the Philippines the percentage of males was higher (51.1%) than females (0.7%) who had PIU, in Slovakia, males had a higher PIU prevalence (8.3%) than females (2.3%). In Ukraine, males were reported to have higher PIU prevalence (8.9%) than females (3.3%) and in Romania too, the prevalence of PIU was reported to be higher among males at 3.7% compared to females at 1.5% (Laconi et al., 2018).

On the contrary, there are some other studies that found the prevalence of PIU to be higher among females than among males. Studies conducted among adolescents in Bangladesh by Uddin et al., (2016) and Mamum et al (2019a, b,) found that the prevalence of PIU was higher among female respondents than males. Likewise, a cross sectional study among Nepalese adolescent students conducted by Kayastha, Gurung and Chawal (2018), found that the female students had a higher PIU prevalence than their counterparts. This indicates that while generally more males than females are at risk of PIU, there are a few exceptions probably due to the different socio-cultural situations. Although apparently there are more males with PIU, it has been found that females are catching up with males in PIU.

Mainly, some of the reasons that have made males more susceptible to PIU than females could be due to the fact that teenage boys are wired to seek competency; to master their world and get better at stuff (Fogg, 2018). Intriguingly, persuasive technology via online betting and gaming, keeps dishing out rewards, hence conveying to adolescents that their competency is growing; a deception utilized by tech corporations using persuasive design. As for World Health Organization (WHO, 2018), a variety of factors contribute to the male gender predisposition at individual and environmental levels. The two levels affect not only the extent and trend of Internet use but also the magnitude of PIU related problems in the adolescent subpopulation. Factors that are environmentally related including socio-economic development and socio-cultural perception such as norms restricting females from visiting some sites or settings such as betting rooms could be reasons why men tend to indulge in disordered Internet use more than females (Mamum & Griffiths, 2019a).

In regard to respondents' age and PIU, the study findings correlate with another study carried out in 2014 that found 26.5% of the 3 billion Internet users worldwide were between 15 and 24 years of age (Bruno, Scimeca, Cava et al., 2014). This is within the age ranges studied in the current study. In this study the effect of adolescents' age on PIU tendency was also confirmed. In other words, the prevalence of PIU was proportionately higher among respondents aged 17-19 at 40.9% than those aged 14-16 and 20-22. This result aligns with several other studies across the world. In East Asia and China, for instance, problematic and risky Internet use was associated with adolescents aged 14-22 (The Statistics Portal, 2014). Another study among adolescent students in the Egyptian population in the academic year 2016/2017 indicated that the prevalence of Internet addiction was 47.7%. Approximately, 13% had no addiction; 39% were mild users; 43.6% were categorized as moderate addicts; and 4% were severe addicts (Rasha, Nesreen, Hanan, 2017). Moreover, the result of this study corresponds with the results of a study carried out in 2017, which focused on the trends of PIU in certain times 2001-2002 and 2012-2013. The findings revealed a noticeable increase in the proportion of students aged 14-21 who used Internet impudently in Slovenian population (Macur, 2017). This study aligns also with Yoo, Cha and Cho (2015) which found that secondary school students are a special group of adolescents as far as PIU is concerned. This implies that PIU could be more prevalent among adolescents aged 14-22 due to increased individualism, reduced parental supervision, and poor

social relationships which is potentially responsible of the increased avoidance and substitution in this adolescent subgroup.

Regarding respondent's level of education, the current study found that the prevalence of PIU was higher at 38.3% among form three students compared to form two students among whom prevalence of PIU was at 36.1%. These findings indicate that prevalence of PIU increased with level of education, since those in higher classes (Form 3), had a higher prevalence in comparison to those in lower classes (Form 2). In support of these findings, studies have indicated that there was a significant association between respondents' education level and PIU among secondary school students. In a study on prevalence of PIU by Bener et al., (2018) among adolescents in schools, the researchers reported that the prevalence of Internet addiction among form three students was at 26.7% higher than the prevalence among lower classes. This may imply that the prevalence of PIU increases as adolescents move to higher levels in their education. This could be attributed to the obligatory existence of computer hubs in all public schools and Internet accessibility through schools' Wi-Fi connectivity. Conversely, results from this study seem to controvert a few other findings on prevalence according to level of education. For instance, a comparable study conducted in Ireland in UK, reported that the students in lower classes were more likely to become pathological users of Internet than those in higher classes (Cerniglia et al., 2017). A number of other studies seem to support Laconi et al (2018) where prevalence of PIU was found to be higher among students of lower classes but then decreases as the years of study increase (Laconi et al., 2018). This could be a warning of an earlier onset of PIU which may instigate most of the students to consider virtual interaction instead of real-life interaction with peers, teachers and parents.

The study results indicated that the students whose parents were self-employed or in business had the same PIU at 21.9% for both the adolescents whose fathers were self-employed and not employed. With regard to the mothers' occupation, the PIU prevalence of those whose mothers were self-employed was higher at 28.1% than prevalence of those whose mother were not employed at 21.7%. This could probably be attributed to easy access of cash from family enterprises as some students assist their parents in running of the businesses. Other studies have reported that the parents' financial situation closely associated with adolescents' risk behavior especially Internet use. These findings are congruent with a study by Lai and Kwan (2017) where

the parents' financial status was positively related to PIU. Similarly, another study upholds the findings of this study where respondents whose parents were self-employed had a higher (83.4%) PIU prevalence than those whose parents were not employed at 77.5% (Bener & Bhugra, 2013). The indication that prevalence of PIU was higher among adolescents whose parents had entrepreneurial employment could perhaps be a reflection of poor parental care and parents lack of awareness in regard to Internet use. Consequently, it suffices to reason that the amount of money provided to the day scholar for their personal use greatly contributed in making them susceptible to PIU.

In terms of respondent's academic performance, the study results indicated that the prevalence of PIU was higher (53.3%) among the respondents whose performance was average than those above average and below average. This finding concurred with a study carried out among school students in South America (Cerniglia et al., 2017), where it was reported that the prevalence of PIU was higher among respondents that were average at 16.1% compared to other academic performance ratings (Bener et al., 2018). However, other studies on PIU prevalence differed from this study where it was reported that students who were below average used Internet more riskily than their colleagues who were above average (Bener & Bhugra, 2013). Regarding the average students, the high prevalence could be ascribed to the fact that they rank in the middle hence a clinched feeling of contentment. This perception might make them engage more in PIU than the above average ones who have a position to maintain and the below average ones who have to work harder to get better ranking.

In this study, family setting played a role in adolescent PIU behaviour. The prevalence of PIU behaviour among students in the category of living with both their biological parents was 40.0%. These findings are inconsistent with the existing family theories and research that observed that most of the studies done among school students who lived in similar family setting. For instance, Shek and Yu (2013) reported that PIU was predominantly high among adolescents who lived with single parents and other family set-ups as opposed to respondents who lived with both parents (Shek & Yu, 2013). Correspondingly, in another study evaluating PIU and associated socio-demographic factors among medical students in a Slovenian urban locality, the researchers reported that the prevalence of students with PIU among students who lived with other younger relatives was (54.9%) and 44.1% among respondents who lived with elderly adopted parents

(Bener et al., 2018). An earlier study conducted in Egypt also agreed with these findings that secondary school students who lived with guardians or foster parents were more predisposed to develop PIU than their colleagues who lived with both biological parents (Bener & Bhugra, 2013). This may be an indication that more strict parental supervision of the adolescents is vital in their lives irrespective of the family setting.

Moreover, the results of this study imply that a significant good number of adolescents could be experiencing unbearable psychological distress and are at high risk of falling into PIU as they seek alternative modes of venting. Likewise, a significant number of adolescents do not seek help, since they are not aware of the negative effects of PIU to their social life and to their general mental health. Therefore, there is need for assessment and for rendering the indispensable help promptly to the adolescents. Nevertheless, this study was limited to day school adolescents from semi-urban settings, who at times struggle with numerous life stressors. Hence, there is need to conduct a comparative study targeting adolescents in different settings.

Conclusion

The objective of this study was to establish the prevalence of PIU among secondary school students in Dagoretti Sub-county and consider PIU in relation to the socio-demographic characteristics of the respondents. Overall, the results revealed that PIU prevalence was (74.4%); higher among male respondents (42.9%) than the female (31.5%). The prevalence was apparently higher (40.9%) among ages 17-19 years and lowest (1.4%) in ages 20-22 years. Given that three quarters of the sampled students were pathological Internet users and with a concern that technology is progressing rapidly, it is a reveille to focus attention to early preventive and interventional measures to combat PIU phenomenon among adolescents. Sequel to the findings of the current study, training and increased health awareness of parents and teachers can be an imperative step towards promoting mental and physical health of adolescents. Besides, the study found male respondents to be more likely to be pathological users than females; implying vulnerability of male students in comparison to female students. This brings about the realization to consider the significance of adolescents' health and the need to institutionalize appropriate training programs on excessive Internet use by male students.

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