

## Research

# Internet Use Patterns, Internet Addiction and Its Association With Psychological Self-Esteem Among Bahir Dar University Students, Ethiopia

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### ABSTRACT

**Background:** Internet addiction is a common problem in university students and negatively affects cognitive functioning, leads to poor academic performance and engagement in hazardous activities, and may lead to anxiety and stress. Behavioural addictions operate on a modified principle of the classic addiction model. The problem is not well inspected in Africa including Ethiopia.

**Objectives:** The purpose of this is to investigate internet use patterns, internet addiction and its association with psychological self-esteem among Bahir Dar University students from December to May 2018/2019 in Bahir Dar University Peda Campus, Ethiopia.

**Methods:** An institution-based cross-sectional study among 359 Bahir Dar University Peda campus students by using a self-administered questionnaire. The study subjects were selected randomly using a stratified sampling technique. The researcher used both descriptive and inferential statistics to present the study findings. Bi-variate techniques, independent sample T-Test and ANOVA were used for continuous variables; Pearson product moment correlation was used for measuring associations.

**Results:** The results show that 91.3% of university students were using the Internet at the time of data collection from which majority 58.2% of them used Smartphone to access the internet. The majority of student under category of normal 36.7% and moderate (33.7%) level Internet addiction, and there is statistically significant difference between sex at ( $t=2.0, p = .001$ ) in Internet addiction score. There is a negative relationship between students' level of Internet addiction and psychological self-esteem level.

**Conclusion:** The current study documents a high prevalence of internet addiction among University students. Factors associated with internet addiction were spending more time, having mental distress, playing online games, current that chewing, and current alcohol use. As internet addiction becomes an evident public health problem, carrying out public awareness campaigns may be a fruitful strategy to decrease its prevalence and effect. Besides to this, a collaborative work among stakeholders is important to develop other trendy, adaptive, and sustainable countermeasures.

**Keywords:** Internet Use Patterns, Internet Addiction, Psychological self-esteem, University students

### Introduction

Different researches stated that internet addiction remains unclassified in the medical, psychological, and mental health fields, no universally accepted description exists that undoubtedly operationalize 'Internet addiction'. Empirical stud provided a number of working definitions of 'excessive use of the internet', that have been customized from other accepted definitions of addiction, e.g., substance dependence, pathological gambling and technology addiction [1,2]. Still, a review of accessible literature demonstrate that Internet addiction is generally characterized by excessive amounts of time exhausted online, obsessive use of the Internet, difficulty in managing the time spent on the Internet, feeling that the World outside of the Internet is boring, becoming irritated if disturbed while online, decreased social interaction with "genuine" people [3].

The quantity of time spent on the internet has been shown to be significantly associated to increasing vulnerability internet addiction [4] and low self-esteem[5,6] found that Internet addicts often spent online, in a day whereas non-addicts rarely use the internet per day. Likewise Ceyhana [4] explained that, on the average, addicts spent 25 hours per week online compared to nine hours for non-addicts.

According to Kesraporn [1] internet addiction has been associated with both positive and negative impacts on different

aspects of people's lives. Positive impacts include improving relationships between friends and family while its negative impacts are usually linked with low academic achievement; health and personal relationships problems; and some other social problems. The early internet paradox study conducted by Robert K [7], investigated the positive impact, according to their review, having more social resources, amplified the benefits that people got from using the Internet on several dependent variables. Among extroverts, using the Internet was associated with increases in community involvement and self-esteem, and declines in negative impact loneliness. Some studies do support the above study claiming that Internet using is associated with more family communication and greater increases in computer skill among people with more rather than less social support. These studies underline that age of users does matter, implying that adults and teens gain somewhat different benefits from greater Internet use than elders. Generally, these findings seem to suggest that as age increases Internet Use tend to encourage increase face-to-face interactions locally and closeness of Internet users to geographically distant relatives and friends [8]. Thus, depending on the demographic, psychological, and social characteristics of the user, using the Internet can prove to be an extremely important social and communications tool impacting positively our daily lives at home and at work [3].

However, recent researches conducted within the last 10 years have shown that, excessive use of Internet, characterized by frequent or poorly controlled preoccupations, urges/behaviors regarding Internet use, tend to lead to impairment or distress, low self-esteem, depression, and overall low well-being [9-12]. A study conducted in Ethiopian context recently also uncovered that Internet addiction has a relationship with low self-esteem, loneliness, and depression [13].

### Reasons allied with internet dependence

Different studies tried to notice several issues related to Internet dependence. In the present study, three main causes believed to have association with Internet addiction are treated, namely, gender, self-esteem; and loneliness. Consequently, in the remaining sections of the review of literature a review of studies will be conducted on the association between Internet addiction and these three variables, however, the latter two, that is, loneliness, and self-esteem, being psychological in nature will be treated to illustrate their conceptual bases and also bring out factors related to each and particularly possible variation they show across the sexes.

### Issues related with self-esteem

Many studies reported that self-esteem is affected by different factors and has association with different psychological, personality and social variables, for instance, self-esteem were relationships with education achievement [14]. Different writers have drawn very different conclusions from relationship between self-esteem and school performance. On the other hand, low self-esteem affiliation with excessive internet use [15,16] psychological health, depression, loneliness, and stress [17]. For example, studies often find that a significant correlation between aggression and self-esteem, which means high self-esteem, is associated with both the presence and the absence of aggression. And, people with high self-esteem are found at the extremes of both high and low hostility. The current study attempts to investigate the relationship between self-esteem and loneliness and Internet addiction.

### The relationship between internet addiction and gender

There is no difference in the time spent on internet practice and loneliness across the sexes and age [8]. Correspondingly, a study conducted by Kaveri S [18] there is no difference in the time spent on Internet addiction across gender and this finding was supported by [11], suggesting that both boys and girls were equally likely to involve in average, excessive and addictive internet use. Similarly, their work of “level of Social Networks Addiction among Ethiopian Youths” investigated that no statistically significant difference was seen across gender in relation to Internet addiction among Ethiopian young people [18].

A study conducted by Lam. L [19] on students uncovered that the difference was statistically significant suggesting that there is a clear variation in internet addiction across female and male students, hence, converging on the conclusion that male students are more exposed to Internet addiction than females. This is also supported by [20] there is a statistically significant variation across the sexes, thus, concluding that boys’ internet addiction Levels are higher compared to the girls’. On the same line but opposite direction, another study has found out that girls use e-mail more often than boys [21].

### The relationship between internet addiction and self-esteem

Personality characteristics such as self-esteem appear to be a significant factor associated with internet use [6]. Studies reported that excessive Internet use resulted in decreased self-esteem [22, 23]. According to these studies, excessive use has a significant negative relationship with self-esteem [15]. However, it is not clear whether low self-esteem results in the excessive internet or whether it causes low self-esteem.

Internet addiction is linked with negative detrimental effects on behavior and compromises one or more aspects of a person's life including his or her personal relationships, health, psychological well-being, job, education, and/or personal hobbies [23]. Similarly, a study conducted by Kraut and colleagues in 1998, concluded that Internet addiction is positively correlated with depression, loneliness, and stress, public opinion about the Internet. However, the strength Internet addiction has with these psychological factors has been found to be different, for instance, a study has noted that excessive Internet does not affect self-esteem as it readily affects loneliness, depression, or social support [24,25].

Researches in the relationship between Internet addiction and self-esteem come up with three different results. The first one shows there is no significant relationship between Internet addiction and self-esteem [23]; the second indicates self-esteem is significantly and negatively correlated with Internet addiction [16]; the third points that there is a positive relationship exists [26].

### The relationship between gender and self-esteem

Rosenberg noticed a possible interaction between gender and self-esteem as early as 1965, and findings henceforth support it. According to the Meta-analysis of [19] males and female differences vary widely across the sub-domains of self-esteem level. Some studies showed that there is no difference at all in addition to the above finding. On the contrary, other studies show moderate differences or fail in finding extremely large differences in self-esteem across gender.

According to Lam, L [19] in their meta-analysis identified "In other areas, such as physical appearance, women's lower self-esteem derives not from actual deficits, but from the more critical reflected appraisals of others—including the larger 'other' of idealized media images"[19]. Still, it is worth noting that some studies in the 90s reported that females are low self-esteem that of males even if the difference is not statistically significant.

Ethiopia has one of the lowest proportions of beneficiaries of internet services compared with other African nations though it was among those few that embraced the service soon after the invention of the Internet in the last quarter of the 19th century [2]. Recent data released by the Internet World Stats claims that the level of Internet penetration has reached 11.1% as of March 31, 2017 (Internet World Stats, 2017). Though this proportion is significantly low compared to other African countries, the current adult literacy rate of the country, which is around 30 percent, suggests that significant number of Ethiopians could easily join the Internet user population provided access is created. Furthermore, considering the fact that the number of young people joining higher institutions is increasing significantly and the ever increasing relevance of Internet use in

higher institutions, it would be highly reasonable to assume that the number of Internet users would show significant increment in the coming years following the same trend in countries with better access to Internet use from which using the internet becomes very important part of University students. A study conducted in 5 Ethiopian universes has found out that the majority of university students use the Internet from 30 to 60 minutes per session; visit their social networks at least once a day; and may fall under “may be addicted” category [13].

It was deemed essential to undertake this research owing to the fact that researches in the area, by and large, are conducted in Developed countries and though internet use is increasing in Ethiopia due to globalization [13] the number of researches conducted is limited. Thus, it was believed that this study would contribute to the improvement of the body of data on the area both locally and internationally [2,3]. Thus, the purpose of this study is to investigate the relationship between excessive use of Internet and self-esteem among university students in Ethiopian context. These research mainly answer the following research questions; the level of Internet addiction and self-esteem among university students and the relationship between Internet addiction and self-esteem?

## Methods and Materials

### Study setting, design and period

An institution-based cross-sectional study was carried out to investigate internet use patterns, internet addiction and its association with psychological self-esteem among bahirdar university students from December to May 2018/2019 in Bahir Dar University Peda Campas. There were eight academic units (College of Social Science, College of Science, College of Humanity, College of Education and Behavioral Science, College of Business and Economics) and including one academy (Sport Science Academy). According to the statistics obtained from the office of registrars of the Bahir Dar University peda campus, there were a total of 1150 regular students enrolled in 2018/2019 at Bahir Dar University Peda Campas [unpublished data]. Most of the students came from the rural areas of Ethiopia.

### Study population

All regular undergraduate students in the year 2018/2019 in Bahir Dar was the source population. In terms of gender, both male and female were the target population of the study. The current organizational structure of Bahir Dar University, arranges department under Colleges, school and institute.

### Sample size determination

A stratified random sampling was used to recruit study participants. In the first stage, by the use of the lottery method, six colleges and one institute were selected. In the second stage, 18 departments were selected. Students were selected proportionally from the given departments based on the number of students of a particular. An overall sample size of 359 was considered to be sufficient to examine each of the research questions posed.

### Sampling procedure

A stratified random sampling was applied to select study participants from the source population. According to the

statistics obtained from the office of registrars of its Bahir Dar University Peda Campas, there were 1150 undergraduate students in 2018; 50.6% were female and 49.4% were males were a total of 1150 regular students enrolled in 2018. First, we divided the students into two strata, male and female students. From each stratum, simple random sampling was used to select participants based on the proportion of the number of students in each stratum. Then, 359 students consented and included in the study.

### Inclusion and exclusion criteria

All generic regular undergraduate adult students whose ages were 18 years and above, and who were present at the time of data collection. Students who gave consent to the study were recruited. The study participants who are blind and severely ill were excluded from the study.

### Data Collection Method

#### Measurements

The dependent variable in this study was limited to the use of internet addiction. Any previous history of internet addiction utilization was also assessed. The independent variable included Socio-demographic characteristics (including gender, year, type of electronics devices used, knowledge about internet use and time spent online) was limited to the study. This measurement has two parts and the first part includes questions on participants' socio-demography information and year in the University and the other part gathers information on general information in relation with the participants internet use and consists of items assessing as to what devices they are using and for what purpose they are using it, etc.

Rosenberg self-esteem scale (RSE-10) instrument is used internationally in many studies and has demonstrated good reliability Cronbach's Alpha of as high as 0.849. It demonstrated also good overall reliability and validity. It is a well internationally accepted instrument with satisfactory cross-cultural sensitivity. The Rosenberg self-esteem questionnaire [29] consists of half positively worded items and the rest half are negatively worded items. The positive and negative 10 items are arranged in random order to reduce the effect of a respondent-set. The items were scored on a four-point scale from strongly agree to strongly disagree.

Internet addiction was assessed with 20-item Internet Addiction Test [30]. Widyan to report that scale items reflect six underlying dimensions of Internet addiction salience, excessive use, and neglect of work, anticipation, lack of control and neglect of Social life. Items are rated on a 5-point scale, where Internet addiction is assessed on a range extending from a ‘very rarely’ to a ‘very frequently’ scale. Total Internet Addiction scores were calculated with the sum of 20 items making the range of the total score extending from 100. The scale showed very good internal consistency, with an alpha coefficient of .93 in the above study.

Data were collected by two academic staff using an anonymous self-administered structured questionnaire. The questionnaire was prepared in English and then translated into Amharic (local language). The researcher used the Amharic version to collect the data.

### **Data Quality Control**

A structured self-administered questionnaire was developed in English and would be translated to Amharic language and again translated back into English to ensure consistency. Data collectors and supervisors would be trained for two days on the objective of the study, the content of the questionnaire, and the data collection procedure. Data would be pilot tested on 5% of the total sample size outside the study area and based on feedback obtained from the pilot test; the necessary modification would be done. During the study period, the collected data would be checked continuously daily for completeness by principal investigator and supervisor in the respective departments.

The responses of the respondents were scored and the reliability of the four scales i.e. Young's Internet Addiction scale and Rosenberg's Self-esteem Scale was computed using the IBM SPSS version 21. The final set of instruments included: After amending 3 items, Internet Addiction Scale [30] for Adolescents consisting of 20 items ( $\alpha = 0.93$ ) and Self-esteem Scale [29] consisting of all ten items ( $\alpha = 0.81$ ). Therefore, the total questionnaire consisted employed in current study were 60 items.

### **Data analysis**

The researcher cleaned and entered data into EPI INFO version 3.5.4 and exported to statistical software packages (SPSS) version 21.0 for data analysis. Descriptive statistics were used to establish overall patterns of distributions, central tendencies, and variations. Bivariate techniques were used as deemed fitting and all correlations and tests for variation were tested for statistical significance and reported when appropriate and a p-value  $<0.05$  were considered statistically significant; Pearson product moment correlation was used for measuring associations; Independent sample T-Test and Analysis of Variance (ANOVA) were used for continuous variables. Before the conducting of any statistical analysis, normal distribution of the dependent variable was tested using Shapiro Wilk Test. Finally, in times where the ANOVA result indicates statistically significant difference across the different groups of students, post hoc tests are conducted.

In the qualitative data the entire audio taped interview was transcribed. The transcription then translated to English. The translated transcript was reviewed and examined line-by-line. Later data were reviewed and combined into meaningful concepts.

## **Results**

### **Scio-demographics of respondents**

The total number of instrument completely and accurately filled and returned was only 359 which is 95.52% of the calculated sample size. From the 359 participants who were enrolled in the study, 50.6% were female and 49.4% were males. The majority of participants had able to use the internet (92.7%) and more than half of the participants use the smartphone (50.6%). Among users of social media over, (55%) of participants were reported, users of Facebook most frequently. (67.2%) of participants use the internet for communication and education, and the majority of the respondents use the internet frequently.

### **Level of internet addiction for all students**

In terms of the level of Internet addiction status of the respondents, the respondent response was grouped into four categories based on the classification by [30] according to their score normal users (0-30), Moderate level (31-49), high level (50-79) and very high level (80-100). The 36.3% of the respondents were grouped under the category of normal levels of Internet addictions while 31.2%, 24%, 6.5% and 1.4% indicated under the category of moderate, high, nonusers, very high level use of internet respectively.

### **Level of internet addiction across gender and year student stayed**

The result showed that among the total participants of males 36.8%, 35.1% and 23.7% of respondents were under the category of moderate level, normal level, and high level of high use respectively. From valid total participants the number of females was 50.6% as can be seen in the 36%, 28.9% and 1.5% of female participants were grouped under the category of moderate Level, normal Level, high Level and very high level of the Internet addiction respectively. On the other hand, 8% of males and 6% of female reported that non-users of internet at all levels of Internet addiction across sex.

An independent sample t- test shown that there is statistically significant difference  $t(332) = 2.0$ ,  $p = .001$ , across male, ( $M = 34.6$ ,  $SD = 15.9$ ) and female ( $M = 38.6$ ,  $SD = 20$ ) of participants. About Internet addiction Level across the duration stayed in the University, first year students reported under the category of normal (44%), moderate (23%), high (9%), and very high (1%) level of excessive use of internet. From the total participants of second-year student 41%, 28%, 26%, 1.4% and 1.4% of students reported under the category of normal, moderate, high, and very high level of excessive use respectively. Finally, 34.4%, 31.1%, 10.3%, 8.2% and 0.8% of third-year students grouped under the category of normal, moderate, high, and very high level of excessive use respectively.

From the distribution of data, one can be concluded that Internet addiction Level across the duration stayed in the University shows a similar pattern. All things considered, the researcher can see that the majority, 37% of the total participants grouped under the category of normal level and the majority 14%. Normal level users of the total participants were second-year students.

### **Level of internet addiction across purpose of internet use and type/device that students use most of the time**

According to cross the level of internet addiction, the result showed 39%, 35%, 20.4%, 6.6% of the total population reported that they uses internet for communication, education, entertainment, news purpose respectively the remaining 8% failed to report the purpose they use the internet most of the time.

About the purpose of internet use, for communication purpose 39%, 32%, and 26%, of respondents respectively reported high, moderate, normal level of internet use. Among those who were reported of using internet for communication purpose majority 38% of respondents felt under the category of high level of Internet addiction. The total participants responded as

they use the internet for education purpose most of the time, the majority of 56% of students categorized under normal level of Internet addiction. Participants reported “use the internet for entertainment purpose” most of the time was 20% of the total participants. However, 53% from those who reported “use the internet for entertainment purpose” were categorized under the moderate level of internet addiction. To conclude, from the remaining 7% of the total participants responded use the internet for news purpose, among them the majority 69% of the group under the category “normal level” of internet use.

Concerning, the level of internet addiction across device that students use most of the time, from the total study participants 51%, 23%, 12%, and 0.5% respondents respectively reported that they use smart phone, laptop, palmtop, other device users in order to access internet and 8% respondents failed to report which device frequently used to access the internet. The distribution devices respondents use across internet addiction level, 43%, of smart phone users, under the category of the “normal level” of Internet addiction and the remaining 57% of smart phone under the category of moderate, high, and very high level of internet use. 48%, 30%, 21% and 1.2% of laptop users most of the time lay under the category normal respectively, moderately high and very high level of Internet addiction. From the study participants, 61%, 34%, 5% of desktop users respectively lay under the category of normal, moderate, high, and very high level of Internet addiction.

From the study participants, 36%, 31%, 22.7% and 9.1% of participant uses' palmtop respectively lays under the category normal, moderate high and very high level of internet addiction the researcher conclude that majority 56% of participants were reported used smart phone in order to access the internet. “Very high” level of Internet addiction not reported in desktop users only, however, it is reported in the remaining groups. One can be concluded that majority of participants used a smart phone to access internet reported a normal level of internet. The remaining participants of use laptop in order to access the internet lays under the category of moderate level of Internet addiction.

#### Level of internet addiction across pattern of internet use

Pattern use of the internet per day from the valid percent of the total participants 33%, 21%, 13%, and 12% respectively reported frequently, occasionally, often, very often, and rarely use internet per day. Regarding the excessive use of internet across time spent online of respondents also see a similar pattern. All things considered majority of respondents all (32.6%), moderate (44.1%), high (30.6%) and normal (25.2%) level of Internet addiction (TABLE 1). As indicated the above table, the mean score of participants in the self-esteem measure was fairly higher compared with the expected average score ( $M=28.7$ ,  $SD=5.31$ ). As part of the self-esteem measure, a total of 10 items which were measured in four point like rt scale were included. Therefore, the expected minimum, maximum and average score in this measure is 13, 40 and 28.7 respectively. The data show that the average score (28.8) for self-esteem measured by Rosenberg self-esteem scale total was approximately equal to Ethiopian mean score collected from 176 males and 183 females total 359 based on data 29.4 are mean scores of Ethiopian as measured by using Rosenberg self-esteem English version

(David & Juri, 2005) When we see mean, median and modes were fairly similar, indicating that the distribution of scores was quite normal. However, the scores were slightly positively skewed ( $0.06$ ,  $p < 0.05$ ), all the participants were fairly equal responded the scale.

#### Level of self-esteem across gender

To examine the difference between males and females in overall self-esteem, independent sample t-test was conducted to determine whether there was a significant difference or not. A total of 10 items were included to measure the dependent variable self-esteem. Mean score shows that male students' self-esteem measure ( $M = 29.5$ ,  $SD = 4.27$ ) was significantly different from that of females ( $M = 27.9$ ,  $SD = 6.07$ ). The result of the independent samples t-test showed that there males was a statistical significantly higher level of self-esteem than females  $t(357) = 2.93$ ,  $p < 0.05$ . Thus, it can be said that male student's response has significantly high mean self-esteem score than female (TABLE 2).

A one-way ANOVA was carried out to find out if there exists a variation in self-esteem as measured by Rosenberg self-esteem scale across year stayed in the university of the participant students, the results were shown that, there was no statistically significant difference exists  $F(2, 366) = 1.67$ ,  $p = .188$ , between mean score first year ( $M = 28.7$ ,  $SD = 4.8$ ), second year ( $M = 28.2$ ,  $SD = 5.7$ ), and third year students ( $M = 29$ ,  $SD = 5.31$ ). Thus, as shown in the data, even if the highest mean score self-esteem level was 29.4 for the third year, there was no statistically significant difference across first, second, and third year students in self-esteem level.

#### Level of self-esteem across device users to access the internet

(TABLE 3). A one-way ANOVA was carried out to find out if there exists a variation in self-esteem as measured by Rosenberg self-esteem scale across students' year stayed at the university and the results have shown that there were statistically significant difference exist at  $F = 2.93$ ,  $p < .05$  as shown in the (Table 3) above. Accordingly, a posthoc test was carried out to detect exact differences inherent among the four groups of students mentioned. Before conducting the posthoc test, the test of homogeneity of variances was analyzed as usual to determine which type of posthoc tests to be used. Accordingly, the Levine's test of homogeneity of variances clearly indicated that the variances of the four device users groups were equal,  $F =$

Table 1: Statistical level of self-esteem.

Descriptive statics	Level
Mean	28.7872
Median	28.451
Mode	31.5
Std. Deviation	5.31296
Minimum	13
Maximum	40
Skewness	0.06
Kurtosis	-0.127
Std. Error of Kurtosis	0.253
Range	29.83

**Table 2: Mean standard deviation and ANOVA for self-esteem level across academic years.**

Year in university	N	Mean	SD	F Sig	
First-year student	124	28.7492	4.79789	1.67	0.3
Second-year student	123	28.1892	5.69095		
Third-year student	122	29.4288	5.38647		
Total	359	28.7872	5.31296		

\*P < .05 **Note :** Higher scores in Roseburg self-esteem scale indicate high self esteem

**Table 3: Mean standard deviation and one way ANOVA.**

Devices	N	Mean	SD	F	Sig.
Laptop computer	87	28.6103	5.25433	2.93*	0.015
Smart phones	192	28.4408	5.31284		
Desktop computer	48	30.5675	4.75304		
Palmtop computers	26	26.1072	4.77476		
Other	4	29.9737	0		
Total	359	28.6159	5.24767		

\*P < .05 **Note:** Higher scores in Roseburg self-esteem scale indicate high self esteem

**Table 4: Descriptive Statistics, correlation, and ANOVA between Internet addiction & self-esteem.**

Variables	Mean	Std. Deviation	N	r	F
Internet addiction Level	35.94	18.57	359	-.568**	34..97*
Self-esteem Level	28.74		5.363	369	

\*\*P < .001, \*P < .05 **Note:** Higher scores in Roseburg self-esteem scale indicate high self esteem

1.02,  $p = .39$ . There for, Tukey HSD mean comparison indicated that the mean score for laptop users ( $M = 28.6$ ,  $SD = 5.25$ ) was significantly differences from palmtop users mean ( $M=26.1$ ,  $SD=4.7$ ), There was no statistically significant difference between the mean score self-esteem score of laptop, desktop, smart phone and other device users. Thus, one can say that there was statistically significant difference between Laptop users and palmtop users.

#### Level of self-esteem across frequency time spent online

A one-way ANOVA revealed that there is, a statistically significant variation was witnessed the four levels of how often they use internet  $F= 7.88$ ,  $p < .05$ , that is, across those who use the internet rarely, occasionally, frequently, very often and often, and Games-Howell post hoc test was used, as the assumption of homogeneity of variance was violated mean comparison indicated that there was statistically significant difference between mean for rare users ( $M = 31.3$ ,  $SD = 4.2$ ), very often ( $M = 27.2$ ,  $SD = 6.4$ ), and often, ( $M = 26.4$ ,  $SD = 5.9$ ), and there was statistically significant difference between mean score for often, rarely occasionally and frequent users of the internet per day.

Accordingly, Games-Howell post hoc test result, it can't be said an increase in frequencies of use of internet was linked with low level of self-esteem, in other words, the mean score self-esteem level for often was smaller than rarely occasionally users of the internet in a day.

#### The relationship between internet addiction and self-esteems

(TABLE 4). Participant were surveyed about their level of Internet addiction ( $M = 35.94$ ,  $SD = 18.57$ ) and level of self-

esteem ( $M = 28.74$ ,  $SD = 5.363$ ). A Pearson's  $r$  data analysis revealed a moderate negative correlation  $r(359, 269) = -.568$ ,  $P < .001$ . Participants with high level of Internet addiction correlation with the low level of self-esteem.

In addition to Pearson correlation analysis, a one-way ANOVA revealed in order to compare mean self-esteem level across Internet addiction levels (Norma 0-30, moderate 31-49, high 50-79, and very high 80-100 level). The result shows that there was statistically significant difference  $F(4, 359) = 34.97$ ,  $P < .05$  and Tukey HSD test, as the assumption of equality of variance was met, mean comparison indicates that there was statistical significant difference between mean for non-users, normal level users, moderate level users, high level and very high users. Thus, one can say that mean score self-esteem level decreases each level go forward from non-users to very high level of Internet addiction.

#### Discussion

The main objective of this particular study was to investigate the correlation between Internet addiction and, loneliness and self-esteem of the University students. In this particular study six research questions are addressed and major findings of all these research questions are discussed in line with existing theoretical perspectives and empirical findings as follows. One of the objectives of the current study was identifying levels of Internet addiction, loneliness, and self-esteem across (gender, years in the university, purpose internet use and time spent online).

#### Level of internet addiction and use of patterns

Internet addiction was grouped into four categories based on the classification of [30] normal users (0-30), moderate users

(31-49), high level, (50-79) and very high level (80-100). The present study finds that the majority (36.3%) and (31.2%) of total participant students were under the category normal and moderate level excessive internet use. This finding was consistent with the previous local study conducted in the northwest part of Ethiopia at Nekemte, the study concludes that Ethiopian youths consume 30-60 minutes per session; "may be addicted" category of online use.

Regarding male participants, 35.8% were grouped under the moderate level of excessive users and the majority 35% of female participants under moderate level but when we see the difference between both sexes there was a statistically significant difference at  $p < 0.05$ . That means Males were significantly more likely than females in level of internet use. This finding was contradicted by the studies by [19] they uncover that the difference was significant in Internet addiction between female and male students, i.e. male students are more exposed to Internet addiction than females and similarly according to the findings boys' internet addiction levels are higher compared to the girls' [20, 23] but then we see especially e-mail use females were more users than males [21].

When we see the level of Internet addiction across years stayed in the university the findings show that majority of first, second and third-year students were normal internet users, the majority of second-year students. Accordingly, a one-way ANOVA was carried out to find out if there exists a difference in the level of Internet addiction across the first second and third-year students line and the results have shown that no statistically significant variation does exist  $F(2, 359) = .601, P = .54$ . One can say that no difference between years of students stayed at the university. No study was to support or contradict this finding by the researcher.

Another major finding of this section was the level of Internet addiction across purpose of internet use. The current study uncovers that majority of participants of this study use internet for communication and education related purpose most of the time, this finding was supported by the previous finding which concluded that majority study used the internet for personal communication and school-related purpose [31]. In relation to Internet addiction, majority samples of this study who use the internet for communication purpose were under category high level of Internet addiction. This finding was consistent with a study conducted on university students in America concluded that online communication was related to the high level of problematic internet use [21]. one-way ANOVA was carried out to find out if there exists a difference in the level of Internet addiction across the first second and third-year students line and the results have shown that no statistically significant variation does exist  $F(2, 359) = .601, P = .54$ . One can say that no difference between years of students stayed at the university. No study was to support or contradict this finding by the researcher.

### **Levels of psychological self-esteem and across gender, frequency time spent online**

In the current study the level of self-esteem was measured by using Rosenberg self-esteem scale, when we see its level on the students, the mean, median, and modes were fairly similar, indicating that the distribution of scores was normal. When we see mean, median and modes were fairly similar, indicating that

the distribution of scores was quite normal. However, the scores were slightly positively skewed all the participants were fairly equal score. The Rosenberg self-esteem scale across certain personal information (gender, years in the university, purpose internet use, and time spent online) was examined, as these personal information were proven to have a strong theoretical foundation as being important determinants of the university students for this specific study.

In the current study there was a statistically significantly different between the mean score of the male and female students in the level of self-esteem. The students' self-esteem level was dependent on their gender, leading conclusion that male students significantly high mean score than mean score of female.

However, most of the researches were inconsistent with the current studies that have had discussed. Rosenberg noticed a possible correlation between gender and self-esteem as early as 1965, some study come with supporting finding of the above study. For example a Meta-analysis conducted by [19] summarized that males and female differences vary widely across the sub-domains of self-esteem level, and [25], in her comparative review of research literature, concluded that there was evidence for no difference in sex overall self-esteem level.

In the current study, student's relatively less frequent users were more likely to experience high level of self-esteem. The study also showed that self-esteem varies across groups with different time spent online. In general, it was found that low self-esteem were relatively evident among students who use internet often and very often users per day, followed by students who use internet rarely, and occasional in a day.

In support of the current finding [12], in the study of Relationship of Internet addiction with self-esteem in university students, stated that there association between internet use of students and their self-esteem. These studies have shown that students with low self-esteem tend to spend more time on online than those with higher self-esteem and the other study concluded that the amount of time that is spent online activities are the predictors of self-esteem (Mary, 2015).

However, the current finding was also in conflict with the findings of [32], who argued, no significant relationship between the amounts of time spent on online activities and self-esteem. Generally there was a link between internet use and self-esteem.

### **Relationship between internet addiction and psychological self-esteem**

The current finding uncovers that there was a relationship between Internet addiction and level of self-esteem Pearson product. Indicated that there was a statistically significant negative relationship between Internet addiction and self-esteem. In other words, higher in the level of Internet addiction, score lower in self-esteem level.

This finding is consistent with the studies by [15,16,23] concluded self-esteem was strongly and negatively associated with Internet addiction. When we see the cause-effect relation between internet use and self-esteem Internet use does not directly affect self-esteem, but rather that it influences self-esteem through mediating variables [25].

## Conclusion

The majority of students' university students grouped under normal users of the internet. The majority of male students felt under moderate level and majority of female students felt under normal level of Internet addiction.

The result obtained by using RSE scale the average score of total self-esteem score was 28.8 (SD=5.3). The median (28.5), and mode (28.5) Skewness =0.06 it is quite normal, positively skewed distribution and only 56% of students score more than average score and few (11.4%) respondents score low level (below 20) on the RSE scale. . This study also indicates that, there was statistically significant difference across all personal information stated in this study except length of years stayed in the university.

Current section employed 359 students, the students surveyed about their level of internet use and self-esteem. A Pearson product result shows that moderate ( $r = -.57$ ) negative association between Internet addiction and loneliness. The findings of the research reveal that that individual's score higher level of Internet addiction associated with low self-esteem.

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## Conflict of Interest Declaration

The author declares that there is no any competing interest.

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