INTERNET ADDICTION: IT'S RELATION WITH LONELINESS AMONG UNDERGRADUATE STUDENTS OF SOUTH-PUNJAB, PAKISTAN

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ABSTRACT: *The current research aims to explain the excessive use of internet as becomes internet addiction and its relation with loneliness. The sample of (N =1020) undergraduates from Bahauddin Zakariya University Multan (BZU) and The Islamia University of Bahawalpur (IUB) were taken, including 255 male and 255 female from each university. A-Priori sample size was calculated to estimate minimum sample size that was 974 to remove biasness; I was taken twenty three respondents additionally from each university. There were two questionnaires used for measuring variables that were Chen Internet Addiction Scale, and UCLA Loneliness Scale was employed. Cross-sectional survey research design was used. Data was collected through purposive sampling technique and it analyzed by using SPSS version 21.0. Statistical techniques Regression, t-test, mean, and standard deviation were used. The results confirm from the collected data, 28% students have internet addicts, and 13.5% have high level of loneliness. Comparatively BZU students have more prevalence of internet addiction and high level of loneliness as compared to IUB. Likewise male students have more occurrences of these psychological problem as compared to female students overall. Study provides the potential negative impact and effect of internet addiction, developed a consensus definition, sign and symptoms of IA, and explored the physical, psychological and sociological outcomes of IA.*

Key terms: Internet Addiction, Problematic Internet Use (PIU), Internet Addiction Disorder (IAD), Loneliness.

INTRODUCTION

The Internet is one of the most widely accessible media in the world [1]. Internets users grow adversely whole of the world [2]. The highly internet users are younger and they label or called as net generation [3,4]. The risk of adolescent's health increased day by day due to emerging phenomenon of problematic internet use, it is less theoretical frame work and need more study to explore it [5]. The rise of the Internet has been accompanied by worries regarding its impact on the health and well-being of children and adolescents. Pakistani youth have been accepted as one of the rising nation of internet users. Users of social networking site Facebook in Pakistan have crossed the nine million mark, making Pakistan the 27th most popular country on Facebook. Around 44,000 new Pakistani users join Facebook every week [6]. There are fewer researches in Pakistan particularly only shocking consequences of internet addiction that's way the present research conduct to investigate the appalling outcomes of Internet addiction and its relation Loneliness [7-10].

Internet Addiction

The internet has emerged to become a daily part and important factor of our lives. Majority of individuals avail vast opportunity to contact with global world, as well as engaged diverse activities including receive any kind of information, educational principles as completing school-work, entertainment as playing online games, reading and writing emails and engaging in real time chatting, business enhancement, and improving standard or quality of life [11-12].

Glasser [13] described addiction positively and explains as addiction an activity had to integrate following features non-challenging and non-competitive with other daily activities, it relatively easy to complete, it could be done single individual without companion, it had completely engaged to the individual, during usage some enhancement would result, and finally it involved without criticism and not occurrence of self-disapproval. Although it is simple criteria could apply to the use of the internet, but the important questioned arises that if positive addictions are actual addictions, it really fulfill many of the signs/ components of standard addictions such as tolerance and withdrawal [14].

Similarly becoming ''addicted'' to the internet, some researchers have further described a correlation between the amount of time that spent individuals during online mostly reported negative consequences [15]. According to Griffiths [16] there are two types of addict individuals, first those who used technology to gain pleasure, and spent easy, enjoyable life. Second those who are using the technology to escape difficulties or divert their attentions from difficult and responsible life toward easy and comfortable life. According to Xu et al., [17] internet addiction is generating much harmful effect especially in developed countries and infected youngster as a contagious disease that lead to individuals isolated from the real world especially high rate in Shanghai.

Addiction defined.

According to Young and de Abreu [12] excessive use of internet lead to a state to the individual as similar abnormal condition that appears to meet the DSM-IV-TR definition of a mental disorder described as "a clinically significant behavioral or psychological syndrome associated with present distress or with a significantly increase risk of suffering pain, disability, or death, and important loss of freedom" [18]

Young [19] suggested that internet involve our daily life, because internet users preferably spend their leisure time in online activities in which 94.8% users are teenagers to provide opportunity to contact with cyber community as a fake identity. Internet and computer usage admired worldwide but its impact adversely on some individuals as well on society [20].

Furthermore, expressing psychological mechanism, a most important factor is psychological dependence that developed as a result of behavioral addictions; in which no physiological exchange occur like intake of a substance but psychologically involvement occur for a specific activity. The concept of behavioral addiction generated from dependency on the internet [21-22]. Behavioral addictions work on as classical addiction model in which individual labelized as a certain mental disorders and abnormal behaviors such as overeating, impulse control disorder, gambling, inattention, hyperactivity and impulsivity, hyper sexuality, and compulsive symptoms [21,23-24].

Symptoms of internet use disorder related to internet addiction in which excessive time denoting, difficulty to stop internet, lack of sleep, fatigue, deficiency in grades or poor work performance, apathy, disturbed thoughts, irritability, decreased social activities and relationships [25-26]. The criteria of internet use disorder include tolerance and withdrawal symptoms, preoccupation, difficulty of control to stop use internet, ignoring harmful consequences, loss of interest in other activities, escaping to face real problems, poor work performance, and loss of relationships [27].

Problematic internet use (PIU).

With the passage of time use of internet becomes a problematic. It is denoted as PIU. There are many researches to support negative aspect of the internet. The most important problem arise in younger is loss of control over internet use, while due to longer period usage of internet, disturbed daily life routine as well as family relationships, loss of appetite, further it effect emotional stability of the individual, finally problematic internet use create high risk for health related issues [28-31]. According to Grohol [32] if individual use internet at least 5 hour a day, it be considered as problematic. In the starting 5 hour is efficient time for become addict of internet. Problematic internet use linked with many psychological problems and pathological behavior [33]. It associated with decrease family communication, shyness and tension, further lead to depression, feelings of intolerance and rigidity [34-37].

PIU is equal for both genders [38]. Male and female commonly use internet for a different purposes, female mostly used for more study purposes and meeting new people via online, communicating in chat rooms create attraction to contact with strangers as compare to male that use for violent games, entertainment, and build romantic relationship using internet [39-43]. Excessive use of internet linked to negative outcomes that relate to pathological gambling and display as poor academic achievement, antisocial behavior and disturbed social relationships [44-45].

Internet addiction disorder (IAD) or internet use disorder (IUD).

Internet addiction disorder is a new digital disorder has been purposed as a new diagnosis in DSM-V, and it is denoted as IAD [8,46]. Internet use disorder also similar to pathological gambling in which automatic behavior or action maintain, that further create problem to stop these actions, after labeling this disorder proper treatment requires to stop repetitive and rigid behavior [47]. Internet emerged as internet addiction disorder [48]. In contrast, different researches proposed various terms regarding IAD in which some discussed previous paragraphs like, Problematic Internet Use, Cyberspace addiction, Internet addiction, Impulse control disorders, impulsive compulsive disorder, and behavioral addiction [49-53,8]. IAD has not been officially define yet, but different researchers agree that certain online activities including, gaming, chatting, gambling, and pornography through various websites engaged individuals and create stamina cause to more use of internet [8]. Moreover, Social applications include online chatting and social networking sites (SNSs) such as face book and finally online instant messengers also contributing to engage individuals with internet [54-57]. Further researches required literature to elaborate IAD in present time as a disorder, as well defines inclusion criteria for psychiatric classification [58].

Internets users grow adversely whole of the world, many researches display percentages of increasing users in different countries. Research reported that approximately one third (30.2%) of the world's population used internet. This ratio increases 480% as compared to previous census conducted in 2000 [2]. likely, in US adolescent use internet has peaked at 93% and this ratio ever changes regularly since 2006 as, social networking sites visited almost 55% as well as in 2008 increase 55% to 65%, likewise 73% in 2009 and 80% in 2011. Another study suggested that Greece was reported as 79% internet users belongs to 13-17 age group and 72% belongs 18-24 age group [59]. Similarly another Canadian research proposed that percentage of internet users enhance rapidly and reached the peak point, like 90% of adolescents use the internet regularly in Canada [60]. Another study conducted in Lebanon, reported that there were an estimated number of 12, 01820 internet users in Lebanon in 2011 [61].

Similarly adverse effect of internet from chin internet addiction scale decreases self-esteem and decrease level of satisfaction with life of the individual that consider as important psychological phenomenon to motivate individuals to show good performance, many researches support that social activities and school achievement direct link with self esteem that effect use of internet, low self esteem and internet addiction lead to poor social activities [62]. IAD lead to other serious psychological problems that adolescents face as a cognitive distortion and decline life satisfaction, internet users claim thought disturbances and error in thoughts that further lead to misperception and wrong decision [63]. Study investigated relationship between internet addiction and loneliness, result shows that loneliness was the major factor that associated with internet addiction. University students felt loneliness as a result of excessive use of internet; they claim disturbed relationships in real life due to virtual world. They became socially attached with many people through social networking but in real life they were alone [64].

Loneliness

Loneliness consider as social isolation is an important contributor to the development of psychological and health related problems especially prevailed in students [65]. Loneliness is strongly associated with internet, adolescents use internet and connected with virtual world but its adverse consequences is adolescents cut off with real relationships that further lead to isolation from reality and creating health

problems [66]. The current studies investigated that advancement in technology generating loneliness, adolescents excessive use of internet and attached with virtual world or cyberspace and isolated with real world, loneliness does not mean it is referred only alone people that not connected or communicated with others, it mean individual lack of contact with others in real life and cease relationships with others in reality due to in touch with virtual world, social isolation effect on quality of life, induce depressive symptoms and causes to disturb interpersonal relationships. Internet create social problems in students, the main social problem is loneliness in which students lack of contact with other social member in real life and develop shyness. Students create specific environment to communicate with each other like online chat rooms, adults sites, but in reality they have unable to contact with other member confidently [67,68]. In contrast, study reported that use of internet beneficial for older adults to decrease feelings of loneliness, internet provide opportunity to contact with new people, chat rooms decrease feelings of boredom, social networking sites decrease social isolation [69]. Loneliness is contributor to initiate addiction of drug, alcohol, cigarettes. Many negative habits associated with loneliness. Hopelessness and helplessness also interlinked with loneliness. Individual who feel lonely are more prone to adopt negative habits and behavior [70-72].

Loneliness plays a mediated role to develop social anxiety, poor social skills, depressive mood and lack of sleep. Students more prone to develop negative behavior as an effect of loneliness, use of tobacco and other related drugs are adverse consequences of loneliness [73]. Loneliness is important factor associated with health issues, it depends on age and education level, study reported that young adults have reported more loneliness with the age of fifteen to nineteen, while more educated also reported more loneliness as compare to secondary or higher secondary educated. Suicidal ideation and sexual behavior strongly associated with loneliness. In contrast, study stated that experience of loneliness more common in early years of adolescents as compare to late adolescents and its more negative effect suffer young adolescents as compare later adolescents. Loneliness is threat that prevents individuals entering social environment, prohibited social activities, further lead to psychological and health problems including depression, anxiety, adjustment problems, heart disease, and lungs disease that discussed here [74-78].

Loneliness is associated with intellectual disability, study probed that more loneliness people measures difficulty in intellectual abilities as compare to socially engaged people. Students who reported lonelier also claim problem in adaptive behavior, learning, and other daily life activities. Lonely students are prone to week in physical activities, mental activities as well as social activities [79]. Loneliness adversely impact on children as a lack of confidence and poor relationships, learning also linked with social interaction but lonely children are socially isolated and have low confidence, problem in learning and motivation [80].

Loneliness is associated with decrease cognitive functions in children, adolescents and adults. Problem in cognition is related to loneliness, an individual are lonely may possibly high risk to decrease cognitive functioning. Memory problem also correlated with loneliness, study reported that lonely people have more memory problems that appeared as recall or retrieved some important information [81]. According to clinicians loneliness is highly associated with mortality and health problems, its need to conduct awareness session regarding loneliness and its impact based on gender differences [82]. Another study investigated that loneliness is key factor that associated with health in later life and linked with mortality in older age, as well as its impact differ on both genders; women are highly associated with loneliness and prevailing health problems in later life as compare to men [83].

Loneliness is associated with mental disorders, a study investigated that loneliness can occur any time and at any stage of life. It leads to produce negative feelings and irrational thoughts. Results indicated feeling of loneliness was more common in female as compare to male. Meanwhile, widow, divorced and singles were more prevailing loneliness as compare to married. Lonely people were more depressed, suffering phobias, OCD and other mental disorders. Furthermore, experience of loneliness prevailing different psychological disorders. Lonely people were socially isolated and their feelings toward society were undesirable, they commonly perceived as unfavorable [84-85]. Similarly, study probed that lonely people have high potential risk to commit suicide, risk of suicidal ideation more prevalent in lonely people [86]. Loneliness created negative emotions, enhance sadness, amplified aggression, longer boredom, and feeling of emptiness that further leading to mental illness, feelings of helplessness and hopelessness [87]. Another study reveals that loneliness is predictor for the development of psychological disorder alexithymia, lonely people suffer interpersonal communication problem and problem in social interaction [88].

Loneliness is serious and major problem for internet addicts and older people in many countries. It diminished social support, social activities, and friend's circle [89]. Study supported that loneliness effect on emotional intelligence of adolescents and negatively influences life satisfaction of adolescents [90]. Another aspect of loneliness is occupational serious danger that felt organizational managers or internet facilitators as a cut off real relationship and maintaining virtual world [91]. Loneliness is distress and painful emotional experience that occur as a result of breaking close relationships and isolated from social world [92]. Disablement interlinked with loneliness, a person emotionally disables to contact with social environment and remain isolated from real world as well feel negative emotions, prevailing distress and sadness feelings [93].

Finally, all literature supported that internet addiction is a growing problem of whole the world for adolescents and adults, especially in students. Internet addiction further contributor toward experience of loneliness in students [94-96]

Objectives of the Study

1. To find out internet addiction in undergraduate university students.
2. To find out loneliness in internet addict students.
3. To compare the prevalence of internet addiction and loneliness among genders and also compare to BZU and IUB students.

Hypotheses

H_1. Excessive use of internet create internet addition tendency in undergraduate university students.

H_2. Internet addiction plays a major role to build feelings of loneliness in students.

H_3. Internet addition and feelings of loneliness is more in BZU students as compare to IUB students, s well as loneliness prevailed greater in male than female undergraduate students of South-Punjab, Pakistan.

METHOD

Participants

The sample was comprised of 1020 (N=1020) undergraduate students from The Islamia University of Bahawalpur and Bahaudin-Zakarya University Multan. A-priori sample size was calculated, minimum required sample 974 was obtained. Twenty three respondents were taken additionally from each University and eleven respondents taken additionally for male and eleven additionally for female candidates from both universities to minimize the biasness of respondents, because researches support that prevalence of internet addiction is equivalent for both genders. This is the rationale that data collected from both universities equally that engrosses 255 male and 255 female belongs to The Islamia University of Bahawalpur. Similarly, 255 male and 255 female students belong to Bahaudin-Zakarya University Multan. The Purposive sampling technique was used for collecting data.

Inclusion and Exclusion Criteria

This research is conducted in Southern Punjab where only two public sector universities exist, first one is Bahaudin-Zakarya University Multan, and second one is The Islamia University of Bahawalpur. Students from all over the region of South-Punjab studies in both universities, hence evidently sample representing whole Southern Punjab. This is reason of our research that can simply and safely be generalized on entire Southern Punjab.

During Pilot study, it becomes known that private universities have not adequate computers lab as compare to public sector universities, as well as private universities students did not located diverse areas of southern Punjab. Furthermore, it emerges that undergraduate students have more prevalence and effected of internet. Consequently, only public sector universities and their undergraduates were included as a final sample of the study.

Procedure

The sample was consist of 1020 undergraduate universities students, in which 510 male and 510 female, further 255 male and 255 female belongs to Bahaudin-Zakarya University Multan, likewise 255 male and 255 female belongs to The Islamia University of Bahawalpur. Purposive sampling technique was used to collect data. There were two tools used for collecting data, before implementation, tools were translated into Urdu language with formal permission of the authors. All tools were validated by using forward and backward translation method, as well as for maintain reliability and validity various relative techniques were implemented, like split-half reliability. Initially pilot study was conducted by selecting participants and validating tools with a formal consent from the author. Forty questionnaires of each tool were distributed among all institutions that targeted for research. Furthermore, after conducting pilot study participants were chosen, and then approach the target participants for collecting data. The purpose of study was explained to them and instructions given to each student regarding questionnaires. First tool was Chen Internet Addiction Scale (CIAS), to measure tendency of internet; second tool was UCLA Loneliness Scale to measures feelings of loneliness. Moreover, after collecting data it was analyzed through SPSS 21.0. Data analyzed by using Mean, Standard Deviation, Regression, t-test as statistical techniques. The results displayed through standard tables. After that, discussion was made on the basis of results and compare with relevant researches. Finally, discussed limitations of the study and suggestion recommended for the betterment of future research.

Measures and covariates

The present study sets out to gauge two main variables; to assess the association of these variables among desired population following questionnaires were used.

1. Chen Internet Addiction Scale by © Ko et al [62].
2. UCLA Loneliness Scale by © Russell [97].

The tools got translated in Urdu language with author's permission by following experts to maintain the validity of the scale (Forward-Translation and Backward-Translation method used).

Forward translation of scales.

1. Mr. Zeeshan Tabassam, Lecturer, Department of Urdu, IUB.
2. Dr. Masood Nadeem, Assistant Professor, Department of Applied Psychology, IUB.
3. Mr. Muhammad Saleem, Lecturer, Department of Applied Psychology, IUB.

Backward translation of scales.

1. Mr. Asif Khan, Assistant Professor, Department of English, IUB.
2. Mrs. Saira Butt, Lecturer, Department of English, IUB.
3. Dr. Masood Nadeem, Assistant Professor, Department of Applied Psychology, IUB.
4. Mr., Muhammad Saleem, Lecturer, Department of Applied Psychology, IUB.

The purpose of translations was to establish the validity of the tools and more understanding to the participants for getting more accurate findings regarding the research purpose. The validity of the tools was calculated by using various relative techniques. The reliability coefficient for the Chen Internet Addiction Scale was found cronbach's alpha coefficient 0.760 [98]. Likely, reliability of UCLA Loneliness Scale

found cronbach's alpha coefficient 0.797. Meanwhile, all values which shows that scales have sufficient reliability and appropriate for the target population. Further explanations of tools are following:

Chin internet addiction scale (CIAS)

Chen Internet Addiction scale developed by © Ko et al [62]. The CIAS is a four-point likert scale that consist of 26-item self-reported scale that assessing five dimensions of Internet-related symptoms and problems, including symptoms of compulsive use, withdrawal symptoms, tolerance symptoms, and problems in interpersonal relationships and health, as well as measures time management problems. The total score of the CIAS ranges from 26–84. Higher CIAS scores indicated high severity of addiction to Internet activity. The internal reliability of the scale and the sub-scales in the original study was ranged from 0.79–0.93, during pilot study the reliability of the scale and the sub-scales found cronbach's alpha 0.760, as well as found good split half reliability (Guttman split-half coefficient 0.447).

UCLA Loneliness scale

UCLA Loneliness Scale, version 3, developed by © Russell [97]. This scale includes 20 Likert-type questions on a four-point scale, with 1=strongly disagree and 4=strongly agree. It is used for adolescence and adults. The score range of this scale is 20-80, below 50 scores indicated little loneliness, 59-60 consider as moderate loneliness and above 60 considered as high feelings of loneliness. The UCLA Loneliness Scale has a good reported validity and reliability (Coefficient a=0.92). After conducting pilot study of translated UCLA loneliness scale reliability found cronbach's alpha coefficient 0.797. It has good split half reliability (Guttman split-half coefficient 0.808).

Research Design

Cross sectional survey method used for this research.

Statistical Analysis

Statistical analysis was performed by using Statistical Package for Social Sciences (SPSS), Version 21.0 [99]. Analyzed data by using descriptive statistics, in which Mean, Standard Deviation, and t-test for comparing mean of both University students from score of Internet addiction and Loneliness, as well use Regression analysis to predict level of significance among all variables.

Precision and Statistical power level

A-priori sample size was calculated for multiple Regressions from online [100]. The anticipated effect size $f^2 = 0.02$, desired statistical power level 0.95, number of predictors 2, probability level 0.04. Finally, minimum required sample size 974 is obtained. Twenty three respondents were taken additionally from each University to minimize the biasness of respondents.

Ethical Considerations

Permission for using the scale has been taken from the respective authors. A departmental permission has also been taken from where the data was collected through the participants. Informed consent taken from all respondents and debriefing the participants regarding research. All participants have filled questionnaires willingly; forced choice not applied on any respondents and not provides any reward or financial assistance to the participants.

Operational Definition of Variables

Internet addiction.

Internet addiction is a relatively dangerous affliction with Internet through different sources that can wreck your health, damage relationships, poorly controlled preoccupations and reduce your overall productivity [51,101].

Loneliness.

The state of being alone in solitary isolation and isolates from the real world and deprives them of the sense of belonging and connection with real world contacts as feelings of emptiness without the companionship of others or alienated as a function of an inability to establish, maintain, and terminate relationships appropriately and interrupts real life relationships [102-103].

RESULTS

The table 1 shows the level of internet addiction in the overall population of both universities. From the 1020 students 28% students have internet addiction and the other 72% do not have internet addiction.

The table 2 shows the comparison of The Islamia University of Bahawalpur and The Bahauddin Zakariya university of Multan according to level of Internet Addiction. From IUB 57 out of 510 students are addicted by internet and 229 out of 510 students from Bahauddin Zakariya University. Hence we conclude that level of internet addiction in the Bahauddin Zakariya University high as compared to The Islamia University of Bahawalpur

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Table 1 *Distribution of sample according to Internet Addiction*

Internet Addiction	Frequency	Percent
Yes (57or Greater)	286	28.0
No (Less than 57)	734	72.0
Total	1020	100.0

Table 2 *Comparison of IUB and BZU according to Internet Addiction*

Institute	The Islamia University		Bahauddin Zakariya University	
Internet Addiction	Frequency	Percent	Frequency	Percent
Yes (57or Greater)	57	11.18	229	44.90
No (Less than 57)	453	88.82	281	55.10
Total	510	100.0	510	100.0

Table 3 *Distribution of sample according to Level of Loneliness*

Loneliness	Frequency	Percent
Little Loneliness (Below 50)	520	51.0
Moderate Loneliness (50-59)	362	35.5
High level of Loneliness (60 and above)	138	13.5
Total	1020	100.0

Table 4 *Comparison of IUB and BZU according to Level of Loneliness*

Institute	The Islamia University		Bahauddin Zakariya University	
Loneliness	Frequency	Percent	Frequency	Percent
Little Loneliness (Below 50)	271	53.14	249	48.82
Moderate Loneliness (50-59)	170	33.33	192	37.65
High level of Loneliness (60 and above)	69	13.53	69	13.53
Total	510	100.0	510	100.0

Table 5 *Descriptive Statistics of all the Variables*

Variables	N	Minimum	Maximum	Mean	Std. Devi
Internet Addiction	1020	26	93	50.59	9.640
Loneliness	1020	32	69	49.75	8.773

Table 6 *t-test for the Comparison of the BZU and IUB in case of Internet Addiction*

Institute	N	Mean	Std. Err	Comparison using t-test			
BZU (Multan)	510	54.69	0.377	Mean Diff	t-score	d.f	P-value
IUB (BWP)	510	46.49	0.395	8.204	15.012	1018	0.000

Note. P < 0.05

Table 7 *t-test for the Comparison of Gender in case of Internet Addiction*

Gender	N	Mean	Std. Err	Comparison using t-test			
Male	510	51.19	0.433	Mean Diff	t-score	d.f	P-value
Female	510	49.99	0.419	1.204	1.997	1018	0.046

Note. P < 0.05

Table 8 *Effect of Internet Addiction on Loneliness*

Dependent Variable	R Square	Std. Error	Regression Coefficient	t-score	P-value
Loneliness	0.029	8.651	0.169	5.477	0.000

Note. a. Predictors: (Constant), Internet Addiction

The table 3 shows the distribution of sample according to level of Loneliness. From the entire sample of 1020 students 520 are at little level of Loneliness which are 51% of the total, 362 (35.5%) students are having moderate loneliness and the remaining 138 (13.5%) are at High level of Loneliness.

The table 5 shows the descriptive statistics of all the variables concerned in the scales. The average score of Internet Addiction is 50.59 with std. deviation 9.640. The average score of Loneliness is 49.75 with std. deviation 8.773.

The table 4 shows the comparison of The Islamia University of Bahawalpur and The Bahauddin Zakariya university of Multan according to level of Loneliness. From IUB 271 out of 510 students are at little loneliness, 170 at moderate and the remaining 69 have high level of loneliness. From Bahauddin Zakariya University 249 students are at little loneliness, 192 are at moderate level of loneliness and the remaining 69 have high loneliness. Hence we conclude that level of Loneliness in students of Bahauddin Zakariya University is high as compared to students of The Islamia University of Bahawalpur.

The table 6 shows the comparison of the both universities (BZU and IUB) in case of Internet Addiction. The average score of The Islamia University of Bahawalpur students is 46.49 with std. error 0.395 and the average score of Bahauddin Zakariya University of Multan students is 54.69 with std. error 0.377, and t-score for the comparison is 15.012 and P-value is 0.000 shows the significance of test at 5% level of significance. As the average of BZU is greater than IUB students hence we conclude that Internet addiction in BZU is higher as compared to IUB.

The table 7 shows the comparison of male and female students in case of Internet Addiction. The average score of the male students is 51.19 with std. error 0.433 and the

Table 9 *Comparison across Gender in case of Loneliness*

Gender	N	Mean	Std. Err	Comparison using t-test			
Male	510	50.12	0.375	Mean Diff	t-score	d.f	P-value
Female	510	49.38	0.401	0.743	1.353	1018	0.176

Note. P < 0.05

Table 10 *Overall summary table of all the corresponding variables*

Institutes		IU (BWP)		BZU (Multan)	
Variables	Reg. Co	Mean	Std. Devi	Mean	Std. Devi
Internet Addiction		46.49	8.931	54.69	8.518
UCLA Loneliness Scale	0.169*	49.45	8.874	50.05	8.669

average score of female students is 49.99 with std. error 0.419, and t-score for the comparison is 1.997 and P-value is 0.046 shows the significance of test at 5% level of significance. The score of males is greater than female hence we conclude that Internet addiction in male is higher as compared to female students.

The table 8 shows the effect of Internet Addiction on feelings of Loneliness in overall population. The value of R-Square is 0.029 and the value of regression coefficient (Beta) is 0.169, the t-score for the testing of significance of Beta is 5.477 and the p-value is 0.000 shows the significance of test at 5% level of significance that shows the influence of internet addiction on loneliness.

The table 9 shows the comparison of male and female students in case of Loneliness Scale. The average score of the male students is 50.12 with std. error 0.375 and the average score of female students is 49.38 with std. error 0.401, and t-score for the comparison is 1.353 and P-value is 0.176 shows the test is not significant at 5% level of significance. Result shows that level of loneliness is greater in male as compared to female hence we conclude that males feel more loneliness as compared to female.

The table 10 shows the overall summary of comparison of both universities in case of all concerned variables at 5% level of significance. The stars (*) on the values of regression coefficients shows the significance.

DISCUSSION

The current study was conducted to investigate Prevalence of internet addiction in south-Punjab University students and examine its relation with loneliness. The entire sample comprised of 1020 undergraduate students in which 50% belongs to The Islamia University Bahawalpur (IUB) and other 50% belongs to Bahauddin Zakariya University Multan (BZU). Result shows that 286 students have internet addicts out of 1020 that was 28% of entire sample and 72% students have not identified addiction of internet. Result supported that excessive use of internet lead to internet addiction, the first hypothesis of study accepted. The prevalence of Internet addiction in undergraduates is 28% out of 1020 sample that is alarming for this area of Pakistan, but as compare with other countries in South-Punjab ratio of internet addiction in students is less, than other countries and areas like, US adolescent use internet has 93% that was peaked ratio and Greece was reported as 72% for the 18-24 age group internet users [59]. Similarly another Italian research reported that 94.19% of adolescents are normal users of the internet [104].

While comparing both universities, Bahauddin Zakariya university students have more internet addicts as compare to The Islamia University students. Result indicated that 229 students of BZU out of 510 have internet addicts that was 44.90%, as compare 57 students of IUB out of 510 have identified internet addicts that was 11.18%. Hypothesis number three of study accepted. Similarly, results proved that internet addiction in male is higher as compare to female. The mean score of male in internet addiction is 51.19 with std. error 0.433, and female 49.99 with std. error 0.419. Furthermore t-score for the comparison of both genders is 1.997 and P-value is 0.046 shows the significance of test at maintains 5% level of significance. Other researches also supported that internet addiction is grater in male as compare to female [41,105]. Likewise, another study result shows that use of internet is greater in male students as compare to female students; t-score is 4.046, P < 0.001 [106].

Furthermore, internet addiction has significant relationship with loneliness. Result indicated that 520 students out of 1020 have little loneliness that was 51% of entire sample; these students have not addicts of internet. Similarly, 362 students have moderate loneliness that was 35.5%, and 138 students have high level of loneliness that was 13.5% of entire sample. These students have identified internet addicts. The hypothesis number second has proved. Result shows comparably equal 13.53% of students have loneliness of BZU and IUB students. The mean average was 49.75 with standard deviation 8.773. The value of R-Square is 0.029 and the value of regression coefficient $\beta = 0.169$ shows the influence of internet addiction on loneliness. The t-score = 5.477 and the p-value is 0.000 shows the significance of test at 5% level of significance. Meanwhile, the occurrence of loneliness in male is high as compare to female, the mean score of male student is 50.12 with std. error 0.375, and average score of female student is 49.38 with std. error 0.401. The t-score for the comparison is 1.353 and P-value is 0.176 shows the test is not significant at 5% level of significance of both genders. Other researches also supported internet addiction and loneliness, results shows that positive correlation with internet addiction and loneliness $r = 0.194$, $p < 0.01$ [106]. Internet addiction associated with loneliness [107]. Internet addiction created feelings of loneliness in students [66]. On contrast study shows that loneliness has not significant relationship with internet addiction, the values are $\beta = .52$, $p = .89$, $R^2 = .01$. Show insignificant relationship between internet addiction and loneliness [108]. Another research also supported relationship between internet and loneliness, findings are, $\beta = .12$, $p < .05$. There is significant relationship exist between internet addiction and loneliness [109].

CONCLUSION

The present study concluded that 286 (28%) undergraduate students have internet addiction out of 1020 that studies in South-Punjab Universities of Pakistan. While comparing both universities, Bahauddin Zakariya University students have

more internet addicts as compare to The Islamia University, the in the ratio of 229 (44.90%) internet addicts of BZU and 57 (11.8%) internet addicts of IUB. Internet addiction has significant relationship with loneliness. Internet addicts also feel more loneliness as compare to non addicts. Students of BZU are more feelings of loneliness as compare to IUB students.

REFERENCES

[1] Lin, S. S. J., & Tsai, C. C. Sensation seeking and internet dependence of Taiwanese high school adolescents. *Computers in Human Behavior*, ***18,*** 411–26 (2002).

[2] Derbyshire, K. L., Lust, K. A., Schreiber, L. R. N., Odlaug, B. L., Christenson, G. A., Golden, D. J., & Grant, J. E. Problematic Internet use and associated risks in a college sample. *Comprehensive Psychiatry*, ***54***(5), 415–422 (2013). doi.org/10.1016/j.comppsych.2012.11.003

[3] Leung, L. Net-generation attributes and seductive properties of the internet as predictors of online activities and internet addiction. *Cyberpsychol Behav, **7***(3), 333-348 (2004).

[4] Kuss, D. J., & Griffiths, M. D. Internet gaming addiction: A systematic review of empirical research. *International Journal of Mental Health and Addiction*, ***10***(2), 278–296 (2012b).

[5] Moreno, M. A., Jelenchick, L. A., & Christakis, D. A. Problematic internet use among older adolescents: A conceptual framework. *Computers in Human Behavior, **29***, 1879-1887 (2013).

[6] Farooqi, H., Patel, H., Aslam, H. M., Ansari, I. Q., Khan, M., Iqbal, N., ... & Asad, N. Effect of Facebook on the life of Medical University students. *International archives of medicine*, ***6***(1), 40 (2013).

[7] Ahn, H. D. Korean policy on treatment and rehabilitation for adolescents' Internet addiction, International Symposium on the Counseling and Treatment of Youth internet addiction. Seoul, Korea: *National Youth Commission*, 433-497 (2007).

[8] Block, J. J. Issues for DSM-V: internet addiction. *Am J Psychiatry*, ***165***(3), 306-307 (2008).

[9] Yoo, H. J., Cho, S. C., Ha, J., Yune, S. K., Kim, S. J., Hwang, J., . . . Lyoo, I. K. Attention deficit hyperactivity symptoms and internet addiction. *Psychiatry Clin Neurosci*, ***58***(5), 487-494 (2004).

[10] Booth, R. Loneliness as a component of psychiatric disorders. *Medscape Mental Health*, **5**(2) (2000).

[11] Mythily, S., Qiu, S., & Winslow, M. Prevalence and Correlates of Excessive Internet Use among Youth in Singapore. *Ann Acad Med Singapore*, ***37***(1), 9-14 (2008).

[12] Young, K. S., de Abreu, C. N. *Internet Addiction: A handbook and guide to*
evaluation and treatment. New Jersey: John Wiley & Sons (2011).

[13] Glasser, W. *Positive addiction.* New York: Harper and Row (1976).

[14] Griffiths, M. D. Behavioral addictions: an issue for everybody? *J Workplace Learn*, ***8***(3),19-25 (1996).

[15] Griffiths, M. D. Sex on the Internet: Observations and implications for internet sex addiction. *J Sex Res, 38*, 331–351 (2001).

[16] Griffiths, M. D. Technological addictions. *Clin Psychol Forum, **95***, 14–19 (1995).

[17] Xu, J., Shen, L. X., Yan, C. H., Wu, Z. Q., Ma, Z. Z., Jin, X. M., & Shen, X. M. [Internet addiction among Shanghai adolescents: prevalence and epidemiological features]. *Zhonghua Yu Fang Yi Xue Za Zhi, **42***(10), 735-738 (2008).

[18] American Psychiatric Association. *Diagnostic and statistical manual of mentaldisorders: DSM-IV-TR* (4th ed., text rev.). Washington, DC: Author (2000).

[19] Young, B. A Study on the Effect of Internet Use and Social Capital on the Academic Performance. *Development and Society*, ***35***(1), 107-123 (2006).

[20] Ko, C. H., Yen, J. Y., Chen, C. C., Chen, S. H., Wu, K., & Yen, C. F. Tridimensional personality of adolescents with internet addiction and substance use experience. *Can J Psychiatry*, ***51***(14), 887-894 (2006).

[21] Bradley, B. P. Behavioural addictions: Common features and treatment implications. *Br J Addict **85***, 1417–1419 (1990).

[22] Marks, I. Behavioural (non-chemical) addictions. *Br J Addict, **85***, 1389–1394 (990).

[23] Holden, C. Behavioral addictions: Do they exist? *Science, **294***(5544), 980–982 (2001).

[24] Miele, G. M., Tilly, S. M., First, M., & Frances, A. The definition of dependence and behavioural addictions. *Br J Addict, **85***, 1421–1423 (1990).

[25] Dong, G., Devito, E. E., Du, X., & Cui, Z. Impaired inhibitory control in 'internet addiction disorder': a functional magnetic resonance imaging study. *Psychiatry Res, **203***(2-3), 153-158 (2012).

[26] Tonioni, F., D'Alessandris, L., Lai, C., Martinelli, D., Corvino, S., Vasale, M., . . . Bria, P. Internet addiction: hours spent online, behaviors and psychological symptoms. *Gen Hosp Psychiatry*, ***34***(1), 80-87 (2012).

[27] Kuss, D. J., Griffiths, M. D., & Binder, J. F. Internet addiction in students: Prevalence and risk factor. *Computers in Human Behavior, **29***, 959-966 (2013).

[28] Christakis, D. A. Internet addiction: a 21st century epidemic? *BMC Med, **8***, 61 (2010).

[29] Coniglio, M. A., Muni, V., Giammanco, G., & Pignato, S. [Excessive Internet use and Internet addiction: emerging public health issues.]. *Ig Sanita Pubbl, **63***(2), 127-136 (2007).

[30] Kim, Y., Park, J. Y., Kim, S. B., Jung, I. K., Lim, Y. S., & Kim, J. H. The effects of Internet addiction on the lifestyle and dietary behavior of Korean adolescents. *Nutr Res Pract, **4***(1), 51-57 (2010).

[31] Weinstein, A., & Lejoyeux, M. Internet addiction or excessive internet use. *Am J Drug Alcohol Abuse, **36***(5), 277-283 (2010).

[32] Frohol, J. M. Too much time online: internet addiction or healthy social interactions? *Cuberpsychol Behav, **2***(5), 395-401 (1999).

[33] Gonul, A. S. Pathological internet use (internet dependency/abuse). *Yeni Symposium*, ***40***(3), 105–110 (2002).

[34] Kraut, R., Patterson, M., Lundmark, V., Kiesler, S., Mukopadhyay, T., & Scherlis, W. Internet paradox. A social technology that reduces social involvement and psychological well-being? *Am Psychol*, ***53***(9), 1017-1031 (1998).

[35] Lavin, M. J., Yuen, C. N., Weinman, M., & Kozak, K. Internet dependence in the collegiate population: the role of shyness. *Cyberpsychol Behav*, ***7***(4), 379-383 (2004).

[36] Shapira, N. A., Goldsmith, T. D., Keck, P. E., Khosla, U. M., & McElroy, S. L. Psychiatric features of individuals with problematic internet use. *Journal of Affective Disorders*, ***57***(1–3), 267–272 (2000).

[37] Yang, C. K., Choe, B. M., Baity, M., Lee, J. H., Cho, J. S. SCL-90-R and 16PFprofiles of senior high school students with excessive internet use. *Can J Psychiatry* ***50***, 407–14 (2005).

[38] Hardie, E., & Tee, M. Y. Excessive Internet use: The role of personality, loneliness and social support networks in Internet addiction. *Australian Journal of Emerging Technologies and Society*, ***5***(1), 34–47 (2007).

[39] Gross, E. F. Adolescent internet use: what we expect, what teens report? *Journal of Applied Developmental Psychology*, ***25***, 633–649 (2004).

[40] Li, N., & Kirkup, G. Gender and cultural differences in internet use: a study of China and the UK. *Computers & Education*, ***48***, 301–317 (2007).

[41] Caplan, S. E. Relations among loneliness, social anxiety, and problematic Internet use. *Cyberpsychol Behav*, ***10***(2), 234-242 (2007).

[42] Aslanidou, S., & Menexes, G. Youth and the internet: uses and practices in the home. *Computers & Education*, ***51***, 1375–1391 (2008).

[43] Kim, M., Kwon, K. N., & Lee, M. Psychological characteristics of internet dating service users: the effect of self-esteem, involvement, and sociability on the use of internet dating services. *Cyber Psychology & Behavior*, ***12***(4), 445–449 (2009).

[44] Griffiths, M., & Wood, R. T. A. Risk factors in adolescence: The case ofgambling, videogame playing, and the internet. *Journal of Gambling Studies*, ***16***,199–225 (2000).

[45] Petry, N. M., & Weinstock, J. Internet gambling is common in college students and associated with poor mental health. *The American Journal on Addictions*, ***16***, 325–330 (2007).

[46] Wolfling, K., Muller, K. W., & Beutel, M. E. Reliability and validity of the scale for the assessment of pathological computer gaming (CSV-S). *Psychotherapie, Psychosomatik, Medizinische Psychologie*, ***61***, 216–224 (2011).

[47] Wolfling, K., Lemenager, T., Peukert, P., & Batra, A. [Computer games and Internet addiction as well as pathological gambling. Therapy approaches]. *Nervenarzt*, ***84***(5), 576-583 (2013).

[48] American Psychiatric Association. *R 40 internet use disorder. DSM-5 development* (2012).

[49] Davis, R. A., Flett, G. L., & Besser, A. Validation of a new scale for measuring problematic internet use: implications for pre-employment screening. *Cyberpsychol Behav*, ***5***(4), 331-345 (2002).

[50] Hur, M. Demographic, habitual, and socioeconomic determinants of internet addiction disorder: an empirical study of Korean teenagers. *Cyber Psychology and Behavior*, ***9***, 514–525 (2006).

[51] Young, K. S., Rogers, R. C. The relationship between depression and Internet addiction. *Cyber psychology and Behavior*, ***1***, 25-28 (1998).

[52] Shapira, N., Lessig, M., Goldsmith, T., Szabo, S., Lazoritz, M., Gold, M., et al. Problematic internet use: proposed classification and diagnostic criteria.*Depression and Anxiety*, ***17***, 207–216 (2003).

[53] Kuss, D. J. Substance and behavioral addictions: Beyond dependence. *Addiction Research & Therapy*, ***4***, *255-265.S6* (2012).

[54] Huang, Y. R. Identity and Intimacy Crises and Their Relationship to Internet Dependence among College Students. *Cyber Psychology & Behavior*, ***9***(5), 571–576 (2006).

[55] Leung, L., & Lee, P. S. N. The influences of information literacy, internet addiction and parenting styles on internet risks. *New Media & Society*, ***14***(1), 117–136 (2012).

[56] Kittinger, R., Correia, C. J., & Irons, J. G. Relationship between facebook use and problematic Internet use among college students. *Cyber psychology, Behavior & Social Networking*, ***15***(6), 324–327 (2012).

[57] Yuen, C. N., & Lavin, M. J. Internet dependence in the collegiate population: the role of shyness. *Cyber Psychology & Behavior*, ***7***, 379–383 (2004).

[58] O'Brien, C. Internet addiction and DSM V. *Addiction*, ***105***, 565 (2010).

[59] Observatory, G. I. S. Internet Use by the Greeks (Report in Greek). *Greek Information Society, Athens*, **20** (2011).

[60] Willoughby, T. A short-term longitudinal study of internet and computer gameuse by adolescent boys and girls: Prevalence, frequency of use, and psychosocial predictors. *Developmental Psychology*, ***44***(1), 195–204 (2008).

[61] Internet World Stats Middle East Internet Usage and Population Statistics. *Usage and population statistics*. Miniwatts Marketing Group (2013).

[62] Ko, C. H., Yen, J. Y., Yen, C. F., Chen, C. C., Yen, C. N., & Chen, S. H. Screening for Internet addiction: an empirical study on cut-off points for the Chen Internet Addiction Scale. *Kaohsiung J Med Sci*, ***21***(12), 545-551 (2005).

[63] Celik, C. B., & Odaci, H. The relationship between problematic internet use and

interpersonal cognitive distortions and life satisfaction in university students. *Children and Youth Services Review*, ***35***, 505–508 (2013).

[64] Bozoglan, B., Demirer, V., & Sahin, I. Loneliness, self-esteem, and life satisfaction as predictors of Internet addiction: A cross-sectional study among Turkish university students. *Scand J Psychol*, ***54***(4), 313-319 (2013).

[65] Cacioppo, J. T., Hawkley, L. C., Crawford, L. E., Ernst, J. M., Burleson, M. H., & Kowalewski, R. B. Loneliness and health: Potential mechanisms. *Psychosom Med*, ***64***, 407-417 (2002).

[66] Fioravanti, G., Dettore, D., & Casale, S. Adolescent Internet addiction: testing the association between self-esteem, the perception of Internet attributes, and preference for online social interactions. *Cyberpsychol Behav Soc Netw*, ***15***(6), 318-323 (2012).

[67] Casale, S., & Fioravanti, G. Psychosocial correlates of internet use among Italian students. *Int J Psychol*, ***46***(4), 288-298 (2011).

[68] Schmit, S., Chauchard, E., Chabrol, H., & Sejourne, N. [Evaluation of the characteristics of addiction to online video games among adolescents and young adults]. *Encephale*, ***37***(3), 217-223 (2011).

[69] Cotten, S. R., Anderson, W. A., & McCullough, B. M. Impact of internet use on loneliness and contact with others among older adults: cross-sectional analysis. *J Med Internet Res*, ***15***(2), e39 (2013).

[70] Barrett, T. F. Manic defenses against loneliness in adolescence. *Psychoanal Study Child*, ***63***, 111-136 (2008).

[71] Ghassemzadeh, L., Shahraray, M., & Moradi, A. Prevalence of internet addiction and comparison of internet addicts and non-addicts in Iranian high schools. *Cyberpsychol Behav*, ***11***(6), 731-733 (2008).

[72] van den Eijnden, R. J., Meerkerk, G. J., Vermulst, A. A., Spijkerman, R., & Engels, R. C. Online communication, compulsive Internet use, and psychosocial well-being among adolescents: a longitudinal study. *Dev Psychol*, ***44***(3), 655-665 (2008).

[73] Zawadzki, M. J., Graham, J. E., & Gerin, W. Rumination and anxiety mediate the effect of loneliness on depressed mood and sleep quality in college students. *Health Psychol*, ***32***(2), 212-222 (2013).

[74] Ladd, G. W., & Ettekal, I. Peer-related loneliness across early to late adolescence: Normative trends, intra-individual trajectories, and links with depressive symptoms. *J Adolesc*. Advance online publication (2013).

[75] Rote, S., Hill, T. D., & Ellison, C. G. Religious attendance and loneliness in later life. *Gerontologist*, ***53***(1), 39-50 (2013).

[76] Vanhalst, J., Rassart, J., Luyckx, K., Goossens, E., Apers, S., Goossens, L., . . . i, D. I. Trajectories of Loneliness in Adolescents With Congenital Heart Disease: Associations With Depressive Symptoms and Perceived Health. *J Adolesc Health*. Advance online publication (2013).

[77] Woods, D. The threat of loneliness. *Br J Community Nurs*, ***18***(2), 57 (2013).

[78] Yadegarfard, M., Ho, R., & Bahramabadian, F. Influences on loneliness, depression, sexual-risk behaviour and suicidal ideation among Thai transgender youth. *Cult Health Sex*, ***15***(6), 726-737 (2013).

[79] Stancliffe, R. J., Wilson, N. J., Bigby, C., Balandin, S., & Craig, D. Responsiveness to self-report questions about loneliness: a comparison of mainstream and intellectual disability-specific instruments. *J Intellect Disabil Res*. Advance online publication (2013).

[80] Simons, L. A., McCallum, J., & Simons, J. Impact of loneliness and living alone. *JAMA Intern Med*, ***173***(4), 322-323 (2013).

[81] Shankar, A., Hamer, M., McMunn, A., & Steptoe, A. Social isolation and loneliness: relationships with cognitive function during 4 years of follow-up in the English Longitudinal Study of Ageing. *Psychosom Med*, ***75***(2), 161-170 (2013).

[82] Obisesan, T. O. Among elderly men, feelings of loneliness are associated with increased 10-year mortality risk, independent of social isolation and medical and psychiatric conditions. *Evid Based Nurs*, ***16***(2), 66-67 (2013).

[83] Netz, Y., Goldsmith, R., Shimony, T., Arnon, M., & Zeev, A. Loneliness is associated with an increased risk of sedentary life in older Israelis. *Aging Ment Health*, ***17***(1), 40-47 (2013).

[84] Lindgren, B. M., Sundbaum, J., Eriksson, M., & Graneheim, U. H. Looking at the world through a frosted window: experiences of loneliness among persons with mental ill-health. *J Psychiatr Ment Health Nurs*. Advance online publication (2013).

[85] Meltzer, H., Bebbington, P., Dennis, M. S., Jenkins, R., McManus, S., & Brugha, T. S. Feelings of loneliness among adults with mental disorder. *Soc Psychiatry Psychiatr Epidemiol*, ***48***(1), 5-13 (2013).

[86] Levi-Belz, Y., Gvion, Y., Horesh, N., & Apter, A. Attachment Patterns in Medically Serious Suicide Attempts: The Mediating Role of Self-Disclosure and Loneliness. *Suicide Life Threat Behav*. Advance online publication (2013).

[87] Kvaal, K., Halding, A. G., & Kvigne, K. Social provision and loneliness among older people suffering from chronic physical illness. A mixed-methods approach. *Scand J Caring Sci*. Advance online publication (2013).

[88] Frye-Cox, N. E., & Hesse, C. R. Alexithymia and marital quality: the mediating roles of loneliness and intimate communication. *J Fam Psychol*, ***27***(2), 203-211 (2013).

[89] Chen, Y., Hicks, A., & While, A. E. Loneliness and social support of older people in China: a systematic literature review. *Health Soc Care Community*. Advance online publication (2013).

[90] Zysberg, L. Loneliness and emotional intelligence. *J Psychol*, ***146***(1-2), 37-46 (2012).

[91] Wright, S. Is it lonely at the top? An empirical study of managers' and nonmanagers' loneliness in organizations. *J Psychol*, ***146***(1-2), 47-60 (2012).

[92] Weeks, M. S., & Asher, S. R. Loneliness in childhood: toward the next generation of assessment and research. *Adv Child Dev Behav*, ***42***, 1-39 (2012).

[93] Warner, D. F., & Kelley-Moore, J. The social context of disablement among older adults: does marital quality matter for loneliness? *J Health Soc Behav*, ***53***(1), 50-66 (2012).

[94] Ceyhan, A. A., & Ceyhan, E. Loneliness, depression, and computer self-efficacy as predictors of problematic internet use. *Cyberpsychol Behav*, ***11***(6), 699-701 (2008).

[95] Hussain, Z., & Griffiths, M. D. The attitudes, feelings, and experiences of online gamers: a qualitative analysis. *Cyberpsychol Behav*, ***12***(6), 747-753 (2009).

[96] Sueki, H. The Effect of Suicide-Related Internet Use on Users' Mental Health. *The Journal of Crisis Intervention and Suicide Prevention*. Advance online publication (2013).

[97] Russell, D. W. UCLA Loneliness Scale (Version 3): Reliability, validity, and factor structure. *Journal of personality assessment*, ***66***(1), 20-40 (1996).

[98] Cronbach, L. J. "Coefficient alpha and the internal structure of tests". *Psychometrika*, ***16***(3), 297–334 (1951).

[99] Statistical Packge for Social Sciences (Version 21) [Computer software]. Chicago III.

[100] Soper, D. A-priori Sample Size Calculator for Multiple Regression. The Statistics Calculators Index now contains 102 free statistics calculators (2006-2013).

[101] Padwa, H., & Cunningham, J. *Addiction: A reference encyclopedia.* United States: ABC-CLIO (2010).

[102] Clayton, R. B., Osborne, R. E., Miller, B. K., & Oberle, C. D. Loneliness, anxiousness, and substance use as predictors of Facebook use. *Computers in Human Behavior*, ***29***, 687–693 (2013).

[103] Perlman, D. European and Canadian studies of loneliness among seniors. *Canadian Journal on Aging*, ***23***, 181–188 (2004).

[104] Poli, R., & Agrimi, E. Internet addiction disorder: prevalence in an Italian student population. *Nord J Psychiatry*, ***66***(1), 55-59 (2012).

[105] Yu, L., & Shek, D. T. Internet addiction in Hong Kong adolescents: a three-year longitudinal study. *J Pediatr Adolesc Gynecol*, ***26***(3 Suppl), S10-17 (2013).

[106] Odaci, H., Kalkan, M. Problematic Internet use, loneliness and dating anxiety among young adult university students. *Computers & Education*, ***55***, 1091–1097 (2010).

[107] Campbell, A. J., Cumming, S. R., & Hughes, I. Internet use by the socially fearful: addiction or therapy? *Cyberpsychol Behav*, ***9***(1), 69-81 (2006).

[108] Appel, M., Holtz, P., Stiglbauer, B., & Batinic, B. Parents as a resource: communication quality affects the relationship between adolescents' internet use and loneliness. *J Adolesc*, ***35***(6), 1641-1648 (2012).

[109] Ang, R. P., Chong, W. H., Chye, S., & Huan, V. S. Loneliness and generalized problematic Internet use: Parents' perceived knowledge of adolescents' online activities as a moderator. *Computers in Human Behavior*, ***28***, 1342–1347 (2012).