

# Problematic Internet Use in South African Information Technology Workers

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**Abstract.** The majority of studies that have looked at Internet addiction and problematic Internet use have focused either on university students or high school pupils as groups at high risk of experiencing problems as a result of their Internet use. This study adopts the approach that within the context of limited access to the Internet, those with access are obviously more at risk than those without access. With this in mind, this paper looks at the prevalence and correlates of problematic Internet use in a sample of 1399 information technology workers. The results indicate that the prevalence of problematic Internet use in this sample was 3.22%, significantly lower than in other studies. Information technology workers were more likely to display symptoms of problematic Internet use if they were younger and male, if they spent a large amount of time online, but not if they had only recently started using the Internet. The best predictors of problematic Internet use were procrastination, using online chat, spending a long period of time online in a single session, and going online more frequently per week. These results are discussed in relation to previous studies of problematic Internet use from around the world.

**Keywords:** Problematic Internet use, information technology workers, online procrastination, Internet addiction.

## 1 Introduction

In recent years there has been a growing number of published research investigating the “addictive” use of the Internet and predictors of Internet addiction [1, 2, 3, 4, 5]. Considerable debate has centred on whether the Internet is indeed “addictive” given that there is no psychiatric classification for “addictions” [6]. Instead, what we see in the literature is a range of terms used to describe the compulsive “overuse” of the Internet or “dependence” on Internet facilities. Terms in common usage include “compulsive Internet use” [7], “Internet dependence” [8], “excessive Internet use” [9], “pathological Internet use” [10], and “problematic Internet use” [11]. Each of these terms describe a range of symptoms that results in decreases in physical and psychological well-being, and problems with social and family interactions, and work commitments. In this study the term problematic Internet use (PIU) is preferred as it based within a theoretical framework of a deficient self-regulation continuum within

Bandura's [12] theory of self-regulation. According to this theory, episodes of deficient self-regulation may be self-remedied. This theory might explain why some studies have found that people who have recently started to use the Internet are more likely to display PIU symptoms [13] or why older users are less likely to display PIU symptoms [13, 14].

### **1.1 Internet Use and PIU in South Africa**

While access to the Internet has grown by approximately 112% in South Africa in the last 6 years, the Internet penetration rate is still rather modest compared to industrially developed countries at approximately 10% of the total population [15]. By comparison, the Internet penetration rates in industrially developed countries such as the United States (69%), Canada (67%), Sweden (75%), United Kingdom (63%), Japan (67%), and South Korea (66%) are significantly higher [15]. The low Internet penetration rate has been attributed largely to the high costs of telecommunications provision [16]. Within South Africa, however, there are certain sectors where the Internet penetration rate is much higher, such as the employed, skilled, urban population [17]. Published studies on the South African Internet population are scarce but support this finding by characterising the South African Internet user as male, English-speaking, in the age group 30 to 39, with a University qualification, a salary within the upper portion of the middle class income range, and access to the Internet primarily from work [18, 19]. The only published study on PIU in South Africa identified the PIU prevalence rate as 1.67% [19]. Compared to PIU prevalence rates in other studies from around the world, this is extremely low. The PIU prevalence rate of 4% in a general South Korean sample [4] is the closest to the South African prevalence rate. However, prevalence rates of 21%-31% in Pakistan [9], 18% in India [20], 18% in the United Kingdom [10], 16% in the Czech Republic [3], and 15% in the United States [8] are several orders of magnitude higher. One possible explanation for the low PIU prevalence rate in South Africa is the relatively modest Internet penetration rate. However, it is quite difficult to make direct comparisons between these different studies due to the variance in instruments used to assess PIU, the different cut-offs applied to determine PIU, the different samples investigated, and the different theoretical models used to understand the phenomenon. For example, all the prevalence studies listed above, with the exception of Whang et al. [4] and Thatcher and Goolam [19], have either used University students or high school pupils as samples. Possibly an adult working population is too busy working to be distracted by excessive non-work-related Internet use.

### **1.2 Groups at Risk of PIU and Information Technology Workers**

The majority of studies that have identified groups "at risk" of PIU have focused on students [3, 8, 9, 10, 11, 21, 22, 23] or high school children [20, 24, 25]. There are a number of reasons why students and high school children have been considered to be high risk for PIU. Firstly, many of the earlier studies found that problematic Internet use was negatively correlated with age and positively with recency of exposure to the Internet [26, 27]. A simple reading of these results would imply that younger Internet users are therefore more vulnerable. More recent studies with general Internet user

samples, and with student samples, would suggest that the correlation with age and recency of exposure to the Internet is less robust [14, 19, 21]. The second reason cited is that schools and Universities usually provide good access to the Internet. Stable and cheap access to the Internet is almost a prerequisite for PIU. The third reason is that for many students this is the first time that they move out of their parent's home and away from the control that they might exert over their Internet use. The final reason is that, in many cases, student and school children samples tend to be convenience samples. General surveys of Internet users [4, 7, 13, 19, 28, 29] are probably the best to identify which groups of Internet users are most vulnerable to PIU. However, the general surveys of Internet users have not specifically identified students or high school children as being at greater risk than other portions of the population. In general surveys, the best predictors of PIU have been identified as Internet usage behaviours such as time spent online, the functions of the Internet such as online gaming or online chatting [4, 7, 19], and personal factors such as personality [13, 29] or mood [28]. In this study we recommend that research needs to investigate other possible vulnerable groups that have stable and cheap access to the Internet. This study specifically targets employees in the information technology (IT) sector as a potential vulnerable group within the South African context. IT employees are a group that is highly skilled within the South African labour market, who work with computers, and who are highly likely to have access to the Internet at their place of work (and may even require the use of the Internet in executing their work duties). Within the context of low Internet penetration rates that we find in South Africa [15], we propose that people with access to computer technology are more vulnerable to problematic Internet use than those with less access to computer technology and the Internet.

### 1.3 Correlates of PIU

A whole host of variables have been considered as predictors of problematic Internet use. These range from biographical variables (age and gender), Internet usage behaviours (length of time spent online, recency of exposure, online gaming and gambling, and online chatting), and psychological variables (depression, loneliness, solitariness, impulsivity and procrastination). Li and Chung [30], Morahan-Martin and Schumacher [21], Niemi et al. [10], and others, have found that PIU was more likely in males than females. In PIU studies, younger users have also been found to be more likely to experience problems with their Internet use than older users [13, 14]. However, Leung [14] found that PIU was more prevalent with females than males and with students rather than scholars or people in formal employment. Yuen and Lavin [8] found no significant differences between males and females on PIU symptoms. Some studies have found that problematic Internet use is most likely to occur with people who have just started to use the Internet [13]. In contrast, Leung [14] found that there was no relationship between problematic Internet use and recency of exposure to the Internet.

The most obvious correlate of problematic Internet use is the length of time that a user spends online [5, 8, 14, 22, 31]. The length of time spent online is particularly important to investigate with IT workers as some, if not all, of these people's jobs might entail being online at least some of the time. One must be careful not to simply

equate problematic Internet use with length of time involved with online activities, particularly in a sample of IT workers. A person whose work centres on being online (e.g. a website developer or network manager) might spend a large proportion of their working day on the Internet in the productive pursuit of their work duties. It is interesting that some studies have found that the length of time spent online is unrelated to PIU [13].

Various functions of the Internet have been found to be more or less conducive towards the development of PIU. In general, interactive functions such as online chatting, online shopping, online games, and erotica tend to cause more problems than information functions such as information-seeking and email [4, 7, 14, 30]. However, Widyanto and McMurren [13] found no significant relationship between the interactive functions of the Internet and problematic Internet use.

The studies investigating psychological predispositions have investigated a plethora of personality and mood dimensions. The most consistent relationship has been found between PIU and depression [11, 20, 22, 29] or sadness [4]. These studies have been correlational in design making it difficult to determine whether depression leads to PIU or whether PIU makes a person depressed. Davis et al. [11] argued that depression was the precursor causing a person to seek out the social/interactive qualities of the Internet. On the other hand, Campbell et al. [1] found no relationship between mood (stress, anxiety, and depression) and time spent online. Various personality traits have been related to PIU including introversion [29], dependence [5], loneliness [21, 28], shyness/anxiety [8, 28], compulsiveness [4], sensation-seeking [31], low self-esteem [5, 10, 32], external locus of control [28], and social disinhibition [10, 21, 31]. However, Campbell, et al. [1] found no relationship between time spent online and depression, anxiety, or social fearfulness (neuroticism, introversion, or psychoticism). Perhaps this is because time spent online is not necessarily directly related to PIU.

Finally, Davis et al. [11] have argued that some individuals use the Internet to avoid certain stressful or demanding situations. Procrastination online (Davis et al., 2002), also referred to as cyberslacking [33] or cyberloafing [34], has been found to be strongly related to PIU and is therefore also important to consider, especially with IT workers. Even when an IT worker is required to be online as part of their job, they might use features of the Internet to avoid doing work-related tasks. In a student sample, Nalwa and Anand [20] found that PIU dependents were more likely to use the Internet to delay completing other work commitments. No research has investigated whether the same is true of IT workers.

## 2 Methodology

A total of 1399 responses were returned from an online survey placed on the website of a prominent South African IT magazine. The survey consisted of a biographical section (9 items), an Internet usage section (6 items), Thatcher and Goolam's [19] Problematic Internet Use Questionnaire (PIUQ) (20 items), and Davis et al.'s [11] distraction subscale (7 items) of the Online Cognition Scale (OCS) to assess procrastination. The scales demonstrated good internal reliability (Cronbach alphas of .92 and .89 respectively) and appropriate factorial validity with this sample. Due to

the large sample size, statistical significance was considered at  $p < .01$  level in the analyses. The respondents included 1065 males and 334 females, mostly in the age groups 24 to 29 years old ( $N=378$ ) and 30-35 years old ( $N=314$ ), with a Diploma ( $N=403$ ) or Bachelor's degree ( $N=259$ ). The majority of respondents had access to the Internet from work ( $N=1311$ ) and/or home ( $N=1039$ ), usually from both locations. Most respondents had been using the Internet for longer than 5 years ( $N=1196$ ) and usually connected to the Internet in sessions of fewer than 2 hours ( $N=703$ ) or shorter than 5 hours ( $N=393$ ) at a time per day. A total of 563 respondents accessed the Internet every day with 495 of the respondents only accessing the Internet every work day. Nearly all respondents use the Internet for email ( $N=1325$ ) although a large proportion of respondents also used other online communication facilities such as online chatting ( $N=239$ ), Instant Messaging (593), and Online telephony ( $N=597$ ).

### 3 Results

#### 3.1 PIU Prevalence in South African IT Workers

Using cut-offs established by Thatcher and Goolam [19], 45 respondents (3.22%) were identified as at high risk of problematic Internet use (scores on the PIUQ of 70+). A further 522 respondents (37.31%) were identified as at moderate risk (scores on the PIUQ between 40 and 69).

#### 3.2 PIU Correlates in South African IT Workers

The correlations of the various Internet use dimensions with the PIUQ score were statistically significant at  $p < .01$  for number of days per week online, length of time online per session, the number of different uses of the Internet (negative correlation), the number of different access points to the Internet, and online procrastination. The PIU score was not significantly correlated with the length of time since starting to use the Internet. The correlations are given in Table 1.

**Table 1.** Internet use variables correlated with the PIUQ score

	Days per week	Time online per session	N uses of the Internet	N access points	Online procrastination	Time since starting to use the Internet
PIUQ score	.27 *	.26 *	-.13 *	.25 *	.67 *	.01

The analyses of the biographical descriptors revealed that the PIUQ score was significantly higher in males ( $t=4.61$ ,  $p < .01$ ) and PIU was negatively correlated with age ( $r = -.13$ ,  $p < .01$ ).

T-tests comparing the PIUQ score on the different uses of the Internet indicated that IT workers who used the Internet for online chatting, instant messaging, online telephony, blogging, peer-2-peer file transfers, and FTP file transfers were likely to have significantly higher PIU scores. There were no statistically significant differences for the use of email or web browsing as shown in Table 2.

**Table 2.** The PIUQ score with different uses of the Internet

Internet use	PIUQ used	Mean if not PIUQ mean if used	t
Online chatting	37.28	49.11	13.37 *
Web browsing	33.94	39.45	2.47 (NS)
Email	36.54	39.46	1.63 (NS)
FTP	38.05	41.01	4.17 *
Instant messaging	37.02	42.41	7.68 *
Online telephony	37.87	43.18	6.77 *
Peer-2-peer file transfers	37.63	44.68	8.73 *
Blogging	48.08	46.53	8.62 *

**3.3 Relative Contributory Factors Towards PIU in South African IT Workers**

A stepwise multiple linear regression resulted in 4 variables explaining a significant proportion of the variance (54% of the variance). The variables of procrastination, length of time online in a session, using online chat, and number of days per week online, were found to be the most important variables in explaining the greatest proportion of the variance in problematic Internet use within this sample (see Table 3). While the regression model was statistically significant ( $p<.05$ ) with the addition of 10 other variables, these variables explained less than 1% additional variance each which was deemed a negligible amount. It was likely that statistical significance in a number of these instances might be an artifact of the large sample size.

**Table 3.** Multiple linear regression showing significant predictors of the PIUQ score in IT workers

Variable entered	Total R <sup>2</sup>	$\Delta R^2$	F
Procrastination	.45		1024.79 *
Length of time online per session	.50	.05	629.42 *
Use of online chat	.52	.02	453.06 *
Days/week online	.54	.015	358.16 *

**4 Discussion**

**4.1 PIU Prevalence Amongst South African IT Workers**

Using the same cut-off criteria as Thatcher and Goolam [19] on the same instrument (the PIUQ) the prevalence of PIU in this sample was 3.22%. This is double the prevalence rate of 1.67% obtained by Thatcher and Goolam's [19], but still relatively low. Due to the comparatively small number of respondents with PIU (N=30 from a total sample of 1795 respondents in Thatcher and Goolam's [19] study and N=45 from 1399 respondents in this study) this may be an artefact of the different samples. The small increase in the prevalence rate may also be a result of the increased access to the Internet [15] or the reducing costs associated with Internet access. This prevalence rate is quite similar to the South Korean sample of 4% [4]. The prevalence

rate in this South African sample is substantially lower than students in Pakistan [9], high school pupils in India [20], British students [10, 21], the general population of Czech users [3], US college students [8], and Taiwanese high school pupils [5, 24, 31]. These differences may also be a result of different sampling methods and criteria for “diagnosing” PIU adopted in the different studies.

## **4.2 PIU Correlates in South African IT Workers**

This study found that males were statistically more likely to display PIU symptoms than females; a result supported by Li and Chung [30], Morahan-Martin and Schumacher [21], and Niemz et al. [10], but contrary to Yuen and Lavin [8] who found no differences between males and females in a sample of students. In this study we found that age was negatively correlated with age suggesting that younger IT workers were more likely to display PIU symptoms than older IT workers. This result is supported by Leung [14] and Widyanto and McMurrin [13]. The correlation, while statistically significant, was not particularly strong ( $r = -.13$ ) suggesting that this statistical significance is largely due to the large sample size. This result is unsurprising given that the South African IT worker sample in this study was dominated by males (76% males).

There were stronger correlations between PIU and indicators of the amount of time spent online (i.e. time spent online per session, the days per week spent online, and the number of access points). These results are consistent with the vast majority of research on PIU [5, 8, 14, 22, 31]. What was quite interesting was the negative correlation between the number of different uses of the Internet and PIU symptoms. This would suggest that a user who engages in fewer types of activities with the Internet is more likely to display PIU symptoms. This is consistent with the notion of specific pathological Internet use as opposed to generalized pathological Internet use [35]. The results also demonstrated that PIU was more likely when the IT workers engaged in interactive online activities such as online chatting, blogging, instant messaging, online telephony and file transfers than with more functional activities such as email and web browsing. This result was consistent with the majority of research looking at PIU and the use of the Internet [4, 7, 14, 30]. Consistent with Leung [14], this study also found no relationship between recency in starting to use the Internet and PIU.

The strongest relationship was between online procrastination and PIU. This was consistent with past research that has looked at PIU and procrastination [11, 20]. This would suggest that with IT workers, PIU is most likely to occur when they are using the Internet to avoid work-related tasks.

## **4.3 Relative Contributory Factors Towards PIU in South African IT Workers**

Significantly, the amount of time spent online in a single session (and other variables used to assess the gross amount of time spent online) was not the variable that contributed most to predicting PIU in IT workers. Online procrastination was the single biggest contributor towards predicting PIU (explaining 45% of the variance in PIU on its own). The length of time that an IT worker spent online in a single session and the number of days per week that an IT worker went online were also statistically

significant predictors, but did not explain a great deal of the variance in PIU (5% and 1.5% respectively). In fact, using online chatting explained slightly more of the variance in PIU (2%) than the number of days per week that an IT worker went online. These results imply that using the Internet to avoid work-related tasks is the best predictor of PIU. However, Davis et al. [11] used the distraction subscale of their Online Cognition Scale (OCS) to assess PIU. The use of the distraction subscale of the OCS to measure Internet procrastination in this study may have exaggerated the strength of the correlation between PIU and Internet procrastination and consequently the strength of the regression.

#### 4.4 Concluding Comments

In many aspects, PIU in South African IT workers displays many of the same signs as PIU in other populations. IT workers who are young and male are more likely to display PIU symptoms than those who are older or female. An IT worker is more likely to suffer from PIU if they spend excessive periods of time online and particularly if the time spent online is for non-work-related activities such as online chatting, blogging, instant messaging, and peer-2-peer file transfers. Where South African IT workers differ from other studies is in the dominance of procrastination in predicting PIU. Spending a large amount of time online is not necessarily an indication of a problem in an IT worker's use of the Internet. After all, some IT workers will spend most of their working day online while actively completing work-related tasks.

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