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臺灣大學生網路成癮與健康相關生活品質之關聯性探討

An Exploration of the Relationships between Internet Addiction
and Health-Related Quality of Life (HRQOL) among College
Students in Taiwan

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# 國立臺灣大學碩士學位論文
# 口試委員會審定書

## 臺灣大學生網路成癮與健康相關生活品質之關聯性探討

## An Exploration of the Relationships between Internet Addiction and Health-Related Quality of Life (HRQOL) among College Students in Taiwan

　　本論文係 陳凱強 君（R00848004）在國立臺灣大學健康政策與管理研究所完成之碩士學位論文，於 民國 102 年 7 月 31 日 承下列考試委員審查通過及口試及格，特此證明

口試委員：

黃俊豪

莊媺智

詹

# 誌謝

隨著論文將要送印成精裝本，以及要離開二十年來的求學生活，我知道這代表著自己即將要往人生的下一處繼續航行。在此刻的心境，既是期待卻也戒慎恐懼，因為在過去一段求學以及力求為人類知識有所貢獻的日子裡，我受他人之助甚多，以致於今日這份碩士論文研究能順利完成，我不敢有一絲居功的念頭。

首先，最要感謝的人是我的指導教授─黃俊豪老師，若非老師在這浩大書海中的引領，我僅憑藉己身之力，鐵定難以靠岸，而在汪洋中迷航。我與老師的不解之緣，可回溯至大學三年級我選擇老師擔任我的導師時開始，這些年來老師對我的協助不勝枚舉，因此在此致謝中，實無法表達出萬一。首先，老師在我參與國科會大專生研究計畫、論文投稿以及國際研討會口頭論文報告的過程中，不遺餘力地給予指導與鼓勵，讓我能略盡學術社群成員應有之本分，並在未來回望這些人生經歷時能不留遺憾；其次，在論文研究上，老師是我最堅實的後盾與品質把關的守門員，於研究設計、問卷研擬、統計分析、結果詮釋、論文撰寫、格式編排、用字遣詞上，不辭辛勞地以師徒式之教學方式，讓我這初生之犢能沾染一些學術之風骨與氣息；最重要的是，老師在待人接物上以身作則，並不吝與我分享他最誠懇之意見，讓我能擴大自己狹小的價值觀，找出己身仍有不足之處，而這些寶貴的意見，亦可供作自己未來人生道路上，減少犯錯的重要守則與依據。在此，我要再次感謝老師一直以來耐心地指導與陪伴，並期許未來自己能謹記老師每一句叮嚀、提醒，繼續將老師的期待─讓人類社會更公平美好─傳播出去。

我也要感謝我的父母、姐姐與家人，因為有他們不計代價地全力支持，才讓我有極良好的求學環境，我亦希望能將這份研究的貢獻歸功於他們。此外，我也要致上最深的謝意給所有 DR H LAB 的夥伴：AM、KP、Fuyo、Suzu、Judy、Felice、Andrew、Boy、Cherry、Paul、HH，以及特別感謝健管所所有老師與同學們，在這些日子裡熱心且無私地給予協助，讓我能順利完成此論文；我也要感謝莊媖智老師與喬芷老師在口試時提供許多寶貴建議。同時，也要感謝 MPH 的助教霈瑜、筠馨，提供我打工機會；以及感謝許澔榮老師，提供我除了學術外，社會經驗與工作實務上的指導。最後，我要感謝上天，讓我雖然在研究所生涯中經歷一些波折與考驗，但是仍保佑我順利渡過這些難關，希望這些考驗能幫助我的行事思想更臻成熟，並能將這些日子所學回饋給社會，讓它更公平美好！

# 中文摘要

**研究目的**：探討臺灣大學生族群網路成癮與其健康相關生活品質之關係。

**研究方法**：本研究針對就讀於臺灣某兩所綜合型大學之全體日間部學生，分別依學院人數，進行等比例分層集束抽樣，並以自填式紙本問卷，蒐集有關大學生網路成癮與健康相關生活品質之資料。研究共收得 1,452 份匿名問卷，回覆率為 90.8%；經資料清理後，最終有效分析樣本共有 1,439 人。問卷中，有關大學生網路成癮與健康相關生活品質之測量，分別係採用中文網路成癮量表（Chen Internet Addiction Scale, CIAS）與台灣版世界衛生組織生活品質問卷（WHOQOL-BREF）。本研究分別使用 CIAS 量表之篩選標準與其分量表得分，來測量網路成癮與網路成癮行為表徵（強迫性、戒斷症狀、耐受性、人際與健康問題、時間管理問題）之變項；而在健康相關生活品質方面，則是依 WHOQOL-BREF 之使用標準，將生活品質分成生理健康、心理、社會關係及環境四大範疇，各範疇之平均得分係介於 4 至 20 分之間。

**研究結果**：大學生在生理健康、心理、社會關係及環境之四大範疇平均得分，分別為 12.49、13.16、13.55 及 14.07 分。多元線性迴歸顯示，在控制相關之背景變項後，大學生網路成癮與其四大範疇之健康相關生活品質具有顯著之負向關聯（β= -.130、-.147、-.103、-.085）。進一步，「網路使用強迫性」、「人際與健康問題」及「時間管理問題」，對其生理健康具有顯著影響（β= -.096、-.100、-.083）；「強迫性」與其心理（β= -.166）與環境（β= -.163）範疇具有顯著之負向關聯；最後，「人際與健康問題」則是顯著影響其社會關係範疇（β= -.088）。

**結論**：未來針對大學生族群健康相關生活品質之健康促進計畫，應考量並納入有關網路成癮之衛教資訊，並且，建議未來須有研究針對網路成癮影響大學生健康相關生活品質之機轉，進行更深入之探討。

**關鍵字**：網路成癮、健康相關生活品質、中文網路成癮量表、世界衛生組織生活品質問卷、大學生、臺灣

# ABSTRACT

**Background:** Internet use has become an integral part of our daily lives, especially for

college students whose learning and social interactions involve extensive use of the

Internet, which places them at high risk for Internet addiction (IA). A variety of

negative health and social consequences have also been reported to be associated with

IA; yet, little is known about the relationships between IA and health-related quality of

life (HRQOL) among college students.

**Objectives:** To empirically examine the relationships of IA and IA behavioral

manifestations with HRQOL among college students in Taiwan.

**Methods:** Data from a total of 1,452 college students were collected from a

self-administered survey (response rate=90.8%), using the proportional stratified cluster

sampling method. IA (including 5 IA behavioral manifestations) and HRQOL were

assessed by the Chen Internet Addiction Scale (CIAS) and the World Health

Organization Quality of Life (WHOQOL-BREF) Taiwan version, respectively. To

adjust for potential confounding effects, the multivariate linear regression analyses also

accounted for participants' background characteristics, health conditions (ADHD,

depression, diagnosed physical and mental disorders), and risk behaviors.

**Results:** The mean domain score of WHOQOL-BREF was 12.49 (SD = 1.78) in

physical health, 13.16 (SD = 2.39) in the psychological domain, 13.55 (SD = 2.22) in
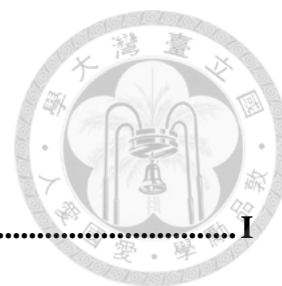
social relationships, and 14.07 (SD = 1.96) in the environment domain. Multivariate

analyses indicated that IA was significantly associated with all 4 domains of HRQOL ($\beta$

= -.130, -.147, -.103, -.085, respectively), after controlling for potential confounding

factors. Further, IA behavioral manifestations such as compulsivity, interpersonal and

health problems, and time management problems were found significantly associated

with decreased HRQOL in physical health ($\beta$=-.096, -.100, -.083, respectively);

compulsivity was also negatively associated with HRQOL in the psychological ($\beta$=-.166)

and environment ($\beta$=-.163) domains; lastly, interpersonal and health problems

significantly affected HRQOL ($\beta$=-.088) in social relationships. Severity of depression

had the strongest negative effects on HRQOL across all 4 domains.

**Conclusions:** This study demonstrated that IA has impacted all aspects of HRQOL

among college students and further illustrated how various IA behavioral manifestations

might affect HRQOL in different domains. Considering that Internet use has permeated

into our daily lives, more research is warranted to illuminate the mechanisms of how IA

affects our HRQOL, and to facilitate the development of effective intervention

programs to prevent the negative consequences of Internet misuse.


**Keywords: Internet addiction, health-related quality of life (HRQOL), Chen**

**Internet Addiction Scale (CIAS), WHOQOL-BREF, college students, Taiwan**

# CONTENTS

# LIST OF TABLES

# Chapter 1　Introduction

## 1.1 The scope of Internet addiction (IA)

Internet use has been interwoven into the fabric of our daily lives for various

purposes. However, excessive Internet use can also be pathological and addictive, which

is usually called "Internet addiction" (IA) (Widyanto & Griffiths, 2006). While there is

still no consensus on the clinical diagnostic criteria of IA, it has been posited that, like

alcoholism or drug addictions, IA could feature all core manifestations of addictions,

including withdrawal, tolerance, and interpersonal conflict (Griffiths, 2000). According

to an editorial published in the American Journal of Psychiatry (Block, 2008), IA has

been considered one of the most serious public health issues in South Korea;

furthermore, China's government has also enacted laws to prohibit adolescents from

playing computer games overtime. As an emerging public health issue, IA has received

increasingly more attention. Notably, youth and adolescents have been identified to be

the most vulnerable to IA, given their psychological and developmental characteristics

and ready access to the Internet (Kandell, 1998). Previous research has reported that the

prevalence of IA was between 8.1% and 12% among American college students

(Christakis, Moreno, Jelenchick, Myaing, & Zhou, 2011; Morahan-Martin &

Schumacher, 2000), and was 9.7% among Turkish college students (Canan, Ataoglu,

Ozcetin, & Icmeli, 2012). A prevalence estimate of 15.7% was also reported among

junior high-school students in Greece (Tsitsika, Critselis, Janikian, Kormas, & Kafetzis, 2011). In Taiwan, more than 99.5% of adolescents aged 15-24 reported Internet usage (Taiwan Network Information Center, 2013), and their prevalence of IA ranged from 5.9% to 18.8% in prior research (Chou & Hsiao, 2000; Ko, Yen, Liu, Huang, & Yen, 2009; Lin, Ko, & Wu, 2011; Tsai et al., 2009; Yen, Yen, Chen, Tang, & Ko, 2009). In view of these findings, it could be argued that IA has become a global health issue and more research is needed to enhance our understanding about the effects of IA on adolescent health.

## 1.2 Internet addiction and its negative health consequences among youth and adolescents

Previous research has found a variety of negative health consequences associated with IA, affecting the physical, psychological, and social aspects of health among youth and adolescents. For example, excessive use of the Internet was related to a number of unhealthy lifestyles that could harm physical health, including poor diets (Tsai et al., 2009), lack of physical activities (Lam, Peng, Mai, & Jing, 2009), alcohol use (Lam et al., 2009; Weinstein & Lejoyeux, 2010), and late-night usage of the Internet (Ceyhan, 2008; Nalwa & Anand, 2003). As an addiction itself, IA also has detrimental effects on psychological health. Besides, several psychiatric disorders have been found to commonly co-occur with IA among adolescents, such as attention-deficit/hyperactivity

2

disorder (ADHD) and depression (Ko, Yen, Chen, Chen, & Yen, 2008; Yen, Ko, Yen, Wu, & Yang, 2007). IA, together with these psychiatric comorbidities, may affect psychological health. Lastly, adolescents with IA also reported significantly lower satisfaction with their family (Cao, Sun, Wan, Hao, & Tao, 2011; Lam et al., 2009), friends (Cao et al., 2011), school or living environment (Cao et al., 2011; Yen, Ko, Yen, Chang, & Cheng, 2009), suggesting that IA had detrimental effects on the social and environmental aspects of their lives. Clearly, IA has numerous negative health consequences in different areas among youth and adolescents; however, relatively few studies have systematically examined the health impact of IA. Therefore, further research is needed to evaluate the overall health consequences of IA in a more comprehensive fashion.

## 1.3 Internet addiction and health-related quality of life (HRQOL)

According to the World Health Organization (WHO), health is defined as a complete state of physical, mental, and social well-being (Grad, 2002). In consistence with this definition, measures of health-related quality of life (HRQOL), such as WHOQOL-BREF, have been developed and increasingly used to assess perceived health status in health research (The WHOQOL Taiwan Group, 2005). In addition, it has been advocated that the concept of HRQOL should be incorporated into addiction research, considering that addictions have features like a chronic condition (Laudet,

2011). Granted that IA is a form of addiction and that IA implicates Internet use in our daily lives, it is crucial to employ HRQOL in exploring the effects of IA on health. However, there is a paucity of information in the existing literature on the relationships between IA and HRQOL, highlighting the importance of such research among youth and adolescents.

## 1.4 The current study

To our knowledge, no studies in the published literature have examined the relationships between IA and HRQOL among college students in Taiwan. Therefore, the present study aimed to bridge this knowledge gap, using validated measures to systematically examine whether IA was significantly associated with various aspects of HRQOL, after controlling for a comprehensive set of important background variables. Further, to better understand their relationships, this study also explored the associations of various IA behavioral manifestations with different domains of HRQOL. Findings of this study could provide insights into the mechanisms through which IA affects HRQOL, and inform future research and prevention programs to mitigate the effects of IA on HRQOL among college students.

# Chapter 2    Methods

## 2.1 Participants

College students in this study were recruited from a private university and a public

university in Taiwan, which are comparable in school size, geographical location, and

diversity of disciplines. A random sample employing the proportional stratified cluster

sampling method was drawn from each university, using disciplines as strata to ensure

the representativeness of the diversity in each university. Departmental required courses

were used as clusters for sampling. Based on the sample size of 800 students from each

university, 1-2 classes (i.e., clusters) were sampled from each discipline. In total, 1,452

responses were received with a response rate of 90.8% (1,452/1,600). After data

cleaning, 13 responses were removed as these students accidentally skipped one or more

pages of the questionnaire, with 1,439 valid surveys included in the final analyses. Most

participants (98.4%) were aged 18—24 years and 1.6% older than 24 (mean=20.51,

SD=1.82).

## 2.2 Measures

### 2.2.1 Internet Addiction: Chen Internet Addiction Scale

Internet addiction was measured by the Chen Internet Addiction Scale (CIAS),

which consists of 26 items on a 4-point Likert-type scale, from "not at all fit" to "very
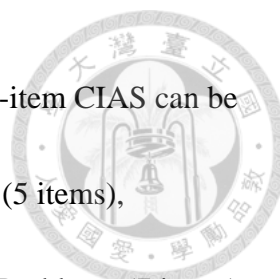
fit" (scored 1 to 4), with a total score ranging from 26 to 104. The 26-item CIAS can be

further divided into 5 behavioral manifestations of IA: Compulsivity (5 items),

Withdrawal (5 items), Tolerance (4 items), Interpersonal and Health Problems (7 items),

and Time Management Problems (5 items) (S. Chen, Weng, Su, Wu, & Yang, 2003).

According to prior research, the cut-off scores of $\geq 64$ and $\geq 68$ have been demonstrated

to exhibit satisfactory psychometric properties for screening and diagnosing IA among

college students, respectively (Ko, Yen, Chen, Yang, et al., 2009).Given that this is a

population-based study using a self-reported questionnaire rather than a clinically based

study, we chose the CIAS cut-off that met the IA screening criteria rather than the

diagnostic criteria. In addition, since there are no empirically validated cut-off points for

the 5 behavioral manifestations of IA, they would be included as continuous variables in

the analyses.

## 2.2.2 Health-Related Quality of Life: WHOQOL-BREF

In this study, HRQOL was measured by World Health Organization Quality of

Life-BREF (WHOQOL-BREF) Taiwan version, the short version of the WHOQOL-100

Taiwan version (Yao, Chung, Yu, & Wang, 2002). The WHOQOL-BREF consists of 26

items (including 2 items of cultural relevance to Taiwan), and encompasses 4 domains

that are essential for the assessment of quality of life—1) Physical Health (7 items; e.g.,

"Do you have enough energy for your daily life?"); 2) Psychological (6 items; e.g., "Do

you often have negative feelings?"); 3) Social Relationships (4 items; e.g., "Are you satisfied with your personal relationships?"); and 4) Environment (9 items; e.g., "Do you have enough money for whatever you need?")—with internal consistency Cronbach's α between 0.70-0.77 and test-retest reliability correlation between 0.76-0.80 (Yao et al., 2002). The mean score of each domain ranges from 4 to 20, with a higher score indicating higher HRQOL (The WHOQOL Taiwan Group, 2005).

### 2.2.3 Health conditions and risk behaviors

Several health conditions and risk behaviors were included in the analyses to account for their potential confounding effects on HRQOL. Concerning health conditions, attention-deficit/hyperactivity disorder (ADHD) and depression were evaluated, as they have both been reported to be associated with IA (Ko et al., 2008; Ko, Yen, Chen, Yeh, & Yen, 2009). The short Chinese version of Adult ADHD Self-Report Scale (ASRS) (Kessler et al., 2005) was utilized to measure ADHD (Cronbach's α = 0.69 in the current study), and a dichotomous variable was created as per its guidelines (Kessler et al., 2007). In regard to depression, the Chinese version of the Patient Health Questionnaire (PHQ-9) (Liu et al., 2011) was used to evaluate the severity of depression (Cronbach's α = 0.82 in this study); as suggested by previous PHQ-9 research, a total score greater than 5 and 10 indicates "mild" and "moderate to severe" depression, respectively (Kroenke, Spitzer, & Williams, 2001; Liu et al., 2011). Moreover, college

students were asked whether they had been diagnosed with any physical or mental

disorders (excluding ADHD and depression, which were both accounted for as shown

above) as they might affect their HRQOL. Lastly, since college students have

consistently been found to engage in a host of risk behaviors (Douglas et al., 1997),

which were also reported to be significantly associated with their HRQOL (Chen &

Storr, 2006; Zahran, Zack, Vernon-Smiley, & Hertz, 2007), participants were asked

whether they had participated in heavy episodic drinking, smoking (HED), and

unprotected sex behaviors in the past year.

## 2.2.4 Background characteristics

Some characteristics were inquired as per the WHOQOL manual (The WHOQOL

Taiwan Group, 2005) and others were also measured to delineate the profile of college

student characteristics that may affect their HRQOL, including: gender, school type,

year in university, grade point average (GPA), region of origin, relationship status,

sexual orientation, religion status, and monthly disposable income.

## 2.3 Procedure

The study protocol was reviewed and approved by the Research Ethics Committee

of the National Taiwan University. Professors offering the sampled courses were

contacted in advance for their permission to administer the questionnaire on a scheduled

date 5-10 minutes before the class was dismissed. Trained researchers would explain the

survey procedure and stress that each student's responses were anonymous and

confidential, and that voluntary completion of this survey constituted the informed

consent to participate. We also provided small gifts and cash prize drawings as

incentives to students who filled out the survey to enhance the response rate. All survey

data were gathered in March of 2013.
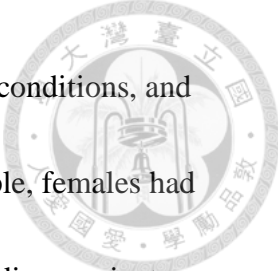
Data analyses were performed using SPSS 20.0. First, background characteristics,

health conditions, and risk behaviors and their associations with 4 HRQOL domain

scores were examined using $t$-test or ANOVA, as appropriate. Second, the bivariate

associations of IA and 5 IA behavioral manifestations with 4 HRQOL domain scores

were then evaluated by $t$-test and Pearson's correlation test, respectively. Finally, we

estimated 2 parallel sets of multivariate linear regression models to evaluate the

associations between IA and 4 HRQOL domain scores: one set adjusted for IA status

classified by the CIAS screening criteria, and the other controlled for 5 IA behavioral

manifestations instead. Both sets of multivariate models controlled for the same

background characteristics, health conditions, and risk behaviors.

# Chapter 3  Results

## 3.1 Background characteristics, health conditions, risk behaviors, and their associations with 4 domain scores of WHOQOL-BREF

Table 1 presents the characteristics of the 1,439 sampled college students and their mean domain scores of WHOQOL-BREF. With regard to their background characteristics, almost 6 in 10 students (58.4%) were females, 50.5% attended a private university, slightly more students were in their junior year (30.2%), nearly 8 in 10 students (78.3%) were from the local area, approximately half (51.5%) had a GPA in the top 40%, 81.9% were heterosexual, 38.0% were in a stable relationship, 49.2% had a religion, and approximately half (50.7%) had a monthly disposable income $\leq$ NT\$8,000. Regarding health conditions, the majority of students had no diagnosed physical disorder (77.8%), 99.0% had no other diagnosed mental disorder than ADHD and depression, 12.4% were classified as having ADHD, and 16.6% were classified as having moderate to severe depression. In addition, students also reported engaging in the following risk behaviors in the past year: heavy episodic drinking (17.4%), cigarette smoking (3.6%), and unprotected sex (10.1%). Lastly, the mean domain score of WHOQOL-BREF was 12.49 (SD = 1.78) for physical health, 13.16 (SD = 2.39) for the psychological domain, 13.55 (SD = 2.22) for social relationships, and 14.07 (SD = 1.96) for the environment domain.

As shown in Table 1, several background characteristics, health conditions, and risk behaviors were significantly associated with HRQOL. For example, females had significantly higher HRQOL in social relationships, while those attending a private university reported significantly lower HRQOL in the environment domain. HRQOL also appeared to decrease from the freshman year to senior year in all domains except environment. In addition, college students in a stable relationship reported higher HRQOL in the psychological domain and social relationships. Lastly, students with ADHD, depression, or any diagnosed physical disorder had significantly lower HRQOL in all domains, and those with any diagnosed mental disorder other than ADHD and depression had lower HRQOL in social relationships.

**Table 1. Characteristics of sampled college students and their associations with 4 domain scores of WHOQOL-BREF (N=1,439)**

| Variable | N | % | Physical Health Mean (SD) | p-value | Psychological Mean (SD) | p-value | Social Relationships Mean (SD) | p-value | Environment Mean (SD) | p-value |
|---|---|---|---|---|---|---|---|---|---|---|
| **Gender** | | | | .700 | | .615 | | < .001 | | .649 |
| Female | 838 | 58.4 | 12.48 (1.73) | | 13.19 (2.29) | | 13.90 (2.03) | | 14.09 (1.91) | |
| Male | 598 | 41.6 | 12.52 (1.86) | | 13.12 (2.54) | | 13.07 (2.38) | | 14.04 (2.02) | |
| **Type of University** | | | | .725 | | .882 | | .270 | | < .001 |
| Public | 712 | 49.5 | 12.51 (1.88) | | 13.16 (2.37) | | 13.48 (2.19) | | 14.37 (1.92) | |
| Private | 727 | 50.5 | 12.48 (1.69) | | 13.15 (2.41) | | 13.61 (2.25) | | 13.77 (1.96) | |
| **Year In University** | | | | .011 | | .007 | | < .001 | | .146 |
| 1st | 323 | 22.8 | 12.70 (1.74) | | 13.35 (2.41) | | 14.01 (2.19) | | 14.20 (1.92) | |
| 2nd | 325 | 23.0 | 12.61 (1.76) | | 13.26 (2.31) | | 13.64 (2.20) | | 13.96 (1.95) | |
| 3rd | 428 | 30.2 | 12.40 (1.79) | | 13.24 (2.40) | | 13.46 (2.17) | | 14.15 (1.98) | |
| 4th | 340 | 24.0 | 12.30 (1.83) | | 12.77 (2.41) | | 13.13 (2.21) | | 13.91 (1.97) | |
| **Region of Origin** | | | | .768 | | .060 | | .696 | | .761 |
| Local | 1,123 | 78.3 | 12.49 (1.79) | | 13.10 (2.43) | | 13.54 (2.26) | | 14.07 (1.99) | |
| Out of town | 311 | 21.7 | 12.52 (1.78) | | 13.39 (2.23) | | 13.59 (2.08) | | 14.03 (1.88) | |
| **Grade Point Average** | | | | .027 | | .144 | | < .001 | | .251 |
| Top 20% | 303 | 21.2 | 12.57 (1.81) | | 13.23 (2.39) | | 13.68 (2.20) | | 14.11 (1.98) | |
| Top 21-40% | 432 | 30.3 | 12.63 (1.68) | | 13.33 (2.34) | | 13.66 (2.10) | | 14.15 (1.89) | |
| Middle 41-60% | 319 | 22.4 | 12.50 (1.80) | | 13.12 (2.38) | | 13.69 (2.15) | | 14.10 (2.03) | |
| Bottom 61-100% | 372 | 26.1 | 12.23 (1.81) | | 12.91 (2.46) | | 13.54 (2.23) | | 13.86 (1.92) | |
| **Sexual Orientation** | | | | .248 | | .004 | | .528 | | .080 |
| Heterosexual | 1,150 | 81.9 | 12.53 (1.78) | | 13.26 (2.38) | | 13.56 (2.22) | | 14.13 (1.95) | |
| Non-heterosexual | 255 | 18.1 | 12.39 (1.77) | | 12.78 (2.37) | | 13.47 (2.20) | | 13.89 (1.96) | |
| **In a Stable Relationship** | | | | .349 | | < .001 | | < .001 | | .391 |
| No | 885 | 62.0 | 12.46 (1.85) | | 12.99 (2.45) | | 13.29 (2.30) | | 14.10 (1.95) | |
| Yes | 543 | 38.0 | 12.56 (1.68) | | 13.44 (2.27) | | 13.98 (2.04) | | 14.01 (1.98) | |
| **Having a Religion** | | | | .798 | | .234 | | .189 | | .187 |
| No | 725 | 50.8 | 12.51 (1.85) | | 13.09 (2.36) | | 13.48 (2.27) | | 14.01 (1.91) | |
| Yes | 702 | 49.2 | 12.49 (1.71) | | 13.25 (2.43) | | 13.63 (2.17) | | 14.15 (2.01) | |
| **Disposable Income (NT$/Month)** | | | | .111 | | .015 | | .292 | | .025 |
| ≤ 4,000[a] | 163 | 11.5 | 12.29 (1.99) | | 12.74 (2.49) | | 13.32 (2.62) | | 13.85 (2.14) | |
| 4,001-8,000 | 556 | 39.2 | 12.44 (1.79) | | 13.04 (2.43) | | 13.51 (2.15) | | 13.99 (1.92) | |
| 8,001-12,000 | 496 | 35.0 | 12.64 (1.73) | | 13.33 (2.35) | | 13.59 (2.20) | | 14.28 (1.91) | |
| ≥ 12,001 | 204 | 14.4 | 12.46 (1.75) | | 13.36 (2.31) | | 13.75 (2.22) | | 13.97 (2.03) | |

(table continues)

**Table 1. (continued) Characteristics of sampled college students and their associations with 4 domain scores of WHOQOL-BREF (N=1,439)**

| Variable | N | % | Physical Health Mean (SD) | p-value | Psychological Mean (SD) | p-value | Social Relationships Mean (SD) | p-value | Environment Mean (SD) | p-value |
|---|---|---|---|---|---|---|---|---|---|---|
| **ADHD[b]** | | | | < .001 | | < .001 | | < .001 | | .001 |
| No | 1,260 | 87.6 | 12.61 (1.72) | | 13.32 (2.32) | | 13.69 (2.18) | | 14.13 (1.97) | |
| Yes | 179 | 12.4 | 11.69 (1.99) | | 12.00 (2.59) | | 12.58 (2.25) | | 13.62 (1.85) | |
| **Severity of Depression** | | | | < .001 | | < .001 | | < .001 | | < .001 |
| None | 600 | 41.7 | 13.30 (1.55) | | 14.37 (2.01) | | 14.39 (1.98) | | 14.75 (1.69) | |
| Mild | 600 | 41.7 | 12.19 (1.56) | | 12.76 (2.07) | | 13.25 (2.01) | | 13.79 (1.86) | |
| Moderate to severe | 239 | 16.6 | 11.24 (1.87) | | 11.10 (2.30) | | 12.20 (2.44) | | 13.04 (2.23) | |
| **Diagnosed Physical Disorder** | | | | .010 | | .003 | | .032 | | .030 |
| No | 1,105 | 77.8 | 12.56 (1.75) | | 13.26 (2.36) | | 13.62 (2.21) | | 14.14 (1.93) | |
| Yes | 315 | 22.2 | 12.27 (1.91) | | 12.81 (2.47) | | 13.32 (2.27) | | 13.87 (2.06) | |
| **Diagnosed Mental Disorder[c]** | | | | .712 | | .095 | | .003 | | .152 |
| No | 1,406 | 99.0 | 12.50 (1.78) | | 13.17 (2.39) | | 13.58 (2.21) | | 14.09 (1.94) | |
| Yes | 14 | 1.0 | 12.33 (2.32) | | 12.10 (2.32) | | 11.83 (2.67) | | 13.33 (3.17) | |
| **Past-Year HED** | | | | .609 | | .535 | | .501 | | .090 |
| No | 1,186 | 82.6 | 12.51 (1.77) | | 13.14 (2.34) | | 13.57 (2.17) | | 14.11 (1.92) | |
| Yes | 250 | 17.4 | 12.44 (1.84) | | 13.25 (2.63) | | 13.46 (2.46) | | 13.88 (2.14) | |
| **Past-Year Smoking** | | | | .960 | | .557 | | .524 | | .734 |
| No | 1,377 | 96.4 | 12.49 (1.78) | | 13.16 (2.39) | | 13.54 (2.23) | | 14.07 (1.96) | |
| Yes | 52 | 3.6 | 12.51 (1.81) | | 13.36 (2.46) | | 13.73 (1.98) | | 14.16 (1.97) | |
| **Past-Year Unprotected Sex** | | | | .500 | | .091 | | .028 | | .045 |
| No sexual activity in the past year | 1,172 | 81.4 | 12.48 (1.79) | | 13.11 (2.40) | | 13.48 (2.22) | | 14.10 (1.94) | |
| No | 101 | 7.0 | 12.69 (1.54) | | 13.66 (2.30) | | 13.90 (2.07) | | 14.30 (1.99) | |
| Yes | 146 | 10.1 | 12.51 (1.84) | | 13.17 (2.36) | | 13.88 (2.25) | | 13.73 (2.06) | |
| **Domain Score of WHOQOL-BREF** | **Mean** | **(SD)** | | | | | | | | |
| Physical Health | 12.49 | (1.78) | -- | | -- | | -- | | -- | |
| Psychological | 13.16 | (2.39) | -- | | -- | | -- | | -- | |
| Social Relationships | 13.55 | (2.22) | -- | | -- | | -- | | -- | |
| Environment | 14.07 | (1.96) | -- | | -- | | -- | | -- | |

Sample sizes of variables vary slightly due to missing values; p-values derived from *t*-test or ANOVA, as appropriate; each of the 4 domain scores ranges from 4 to 20.

[a]NT$4,000 is approximately US$135; €104; £89.

[b]Attention-deficit/hyperactivity disorder

[c]Excludes depression and ADHD

## 3.2 Internet addiction, Internet addiction behavioral manifestations, and their associations with 4 domain scores of WHOQOL-BREF

Table 2 presents the prevalence of IA, the mean scores of 5 IA behavioral manifestations, and their associations with 4 domain scores of WHOQOL-BREF. Among the sampled college students, the prevalence of IA was 33.9%. With regard to IA behavioral manifestations, the mean score was 10.79 (SD = 2.85) for compulsivity, 11.92 (SD = 2.84) for withdrawal, 9.69 (SD = 2.24) for tolerance, 15.23 (SD = 3.72) for interpersonal and health problems, and 10.96 (SD = 3.20) for time management problems. In addition, college students with IA reported significantly lower HRQOL in all 4 domains, and each of the 5 IA behavioral manifestations was also found to have significantly negative correlations with HRQOL in all 4 domains. All p-values in Table 2 were < .001.

**Table 2. Prevalence of Internet addiction (IA), mean scores of IA behavioral manifestations, and their associations with 4 domain scores of WHOQOL-BREF among sampled college students (N=1,439)**

| Variable | N | % | Physical Health | | Psychological | | Social Relationships | | Environment | |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | Mean (SD) | p-value | Mean (SD) | p-value | Mean (SD) | p-value | Mean (SD) | p-value |
| **Internet Addiction** | | | | **< .001** | | **< .001** | | **< .001** | | **< .001** |
| No | 951 | 66.1 | 12.82 (1.64) | | 13.65 (2.29) | | 13.92 (2.07) | | 14.32 (1.88) | |
| Yes | 488 | 33.9 | 11.85 (1.88) | | 12.19 (2.30) | | 12.82 (2.32) | | 13.57 (2.03) | |
| | | | | | | | | | | |
| **IA Behavioral Manifestations** | **Mean** | **(SD)** | *r* | | *r* | | *r* | | *r* | |
| Compulsivity (scored 5-20) | 10.79 | (2.85) | -.278 | **< .001** | -.330 | **< .001** | -.261 | **< .001** | -.196 | **< .001** |
| Withdrawal (scored 5-20) | 11.92 | (2.84) | -.207 | **< .001** | -.245 | **< .001** | -.210 | **< .001** | -.145 | **< .001** |
| Tolerance (scored 4-16) | 9.69 | (2.24) | -.220 | **< .001** | -.266 | **< .001** | -.184 | **< .001** | -.135 | **< .001** |
| Interpersonal and Health Problems (scored 7-28) | 15.23 | (3.72) | -.317 | **< .001** | -.324 | **< .001** | -.306 | **< .001** | -.211 | **< .001** |
| Time Management Problems (scored 5-20) | 10.96 | (3.20) | -.275 | **< .001** | -.256 | **< .001** | -.234 | **< .001** | -.174 | **< .001** |

P-values derived from *t*-test or Pearson's correlation test, as appropriate; each of the 4 domain scores ranges from 4 to 20.
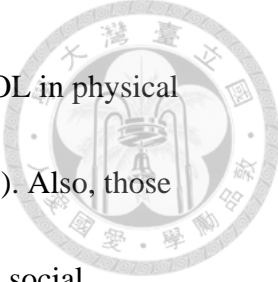
## 3.3 Multivariate linear regression models for factors associated with 4 domain scores of WHOQOL-BREF

Table 3A presents the multivariate linear regression models estimating the associations of IA with 4 domain scores of WHOQOL-BREF among college students, controlling for background characteristics, health conditions, and risk behaviors. Table 3B presents the results of the same analyses as in Table 3A, except that the IA variable was replaced with 5 IA behavioral manifestations. As shown in Table 3A, IA was significantly associated with lower HRQOL in all 4 domains ($\beta$ = -.130, -.147, -.103, -.085, respectively). Similarly, in Table 3B, 3 of 5 IA behavioral manifestations were also found significantly associated with lower HRQOL in different domains. Specifically, compulsivity, interpersonal and health problems, and time management problems were found significantly associated with decreased HRQOL in physical health ($\beta$= -.096, -.100, -.083, respectively); compulsivity was also negatively associated with HRQOL in the psychological ($\beta$ = -.166) and environment ($\beta$ = -.163) domains; lastly, interpersonal and health problems significantly affected HRQOL ($\beta$ = -.088) in social relationships.

In addition to IA-related variables, several other factors were found significantly associated with HRQOL. Since these findings were similar in the 2 parallel sets of analyses, only significant results in Table 3A are reported here. In regard to the

background characteristics, males reported significantly higher HRQOL in physical health ($\beta = .065$), but lower HRQOL in social relationships ($\beta = -.136$). Also, those attending a private university had significantly lower HRQOL in both social relationships ($\beta = -.053$) and the environment domain ($\beta = -.175$). Compared with freshmen, juniors and seniors had significantly lower HRQOL in physical health ($\beta = -.097$ and $\beta = -.080$, respectively) and social relationships ($\beta = -.102$ and $\beta = -.146$, respectively); seniors also reported significantly lower HRQOL in the psychological domain ($\beta = -.090$). Students from out of town had significantly lower HRQOL in the environment domain ($\beta = -.079$). Lastly, those in a stable relationship reported significantly higher HRQOL in the psychological domain ($\beta = .097$) and social relationships ($\beta = .147$).

As regards health conditions, students with ADHD reported significantly lower HRQOL in both physical health ($\beta = -.062$) and social relationships ($\beta = -.061$), whereas those with "mild" and "moderate to severe" depression were significantly affected in all 4 domains. Furthermore, those diagnosed with any mental disorder other than ADHD and depression had significantly lower HRQOL in social relationships ($\beta = -.058$). Lastly, regarding risk behaviors, college students who reported engaging in heavy episodic drinking in the past year had significantly lower HRQOL in the environment domain ($\beta = -.055$).

**Table 3A. Multiple linear regression models for factors associated with 4 domain scores of WHOQOL-BREF, including Internet addiction status classified by CIAS**

| Variable | Physical Health | Psychological | Social Relationships | Environment |
|---|---|---|---|---|
| | β | β | β | β |
| Gender | | | | |
| Female (ref) | -- | -- | -- | -- |
| Male | **.065*** | .024 | **-.136*** | -.004 |
| Type of University | | | | |
| Public (ref) | -- | -- | -- | -- |
| Private | -.043 | -.017 | **-.053*** | **-.175*** |
| Year In University | | | | |
| 1st (ref) | -- | -- | -- | -- |
| 2nd | -.003 | .000 | -.040 | -.009 |
| 3rd | **-.097**** | -.037 | **-.102**** | -.042 |
| 4th | **-.080*** | **-.090**** | **-.146*** | -.064 |
| Region of Origin | | | | |
| Local (ref) | -- | -- | -- | -- |
| Out of town | -.026 | .014 | -.012 | **-.079**** |
| In a Stable Relationship | | | | |
| No (ref) | -- | -- | -- | -- |
| Yes | .021 | **.097*** | **.147*** | -.007 |
| ADHD[a] | | | | |
| No (ref) | -- | -- | -- | -- |
| Yes | **-.062*** | -.044 | **-.061*** | -.008 |
| Severity of Depression | | | | |
| None (ref) | -- | -- | -- | -- |
| Mild | **-.282*** | **-.299*** | **-.238*** | **-.225*** |
| Moderate to severe | **-.379*** | **-.441*** | **-.301*** | **-.293*** |
| Diagnosed Mental Disorder[b] | | | | |
| No (ref) | -- | -- | -- | -- |
| Yes | -.008 | -.024 | **-.058*** | -.033 |
| Past-Year HED | | | | |
| No (ref) | -- | -- | -- | -- |
| Yes | -.031 | .009 | -.020 | **-.055*** |
| Internet Addiction | | | | |
| No (ref) | -- | -- | -- | -- |
| Yes | **-.130*** | **-.147*** | **-.103*** | **-.085**** |

*β* standardized regression coefficient.

All models controlled for GPA, sexual orientation, monthly disposable income, having a religion, diagnosed physical disorder, and past-year smoking and unprotected sex.

*p < .05, **p < .01, ***p < .001

[a]Attention-deficit/hyperactivity disorder.

[b]Excludes depression and ADHD.

**Table 3B. Multiple linear regression models for factors associated with 4 domain scores of WHOQOL-BREF, including Internet addiction behavioral manifestations**

| Variable | Physical Health | Psychological | Social Relationships | Environment |
|---|---|---|---|---|
| | β | β | β | β |
| Gender | | | | |
|   Female (ref) | -- | -- | -- | -- |
|   Male | **.069*** | .022 | **-.136\*\*\*** | -.004 |
| Type of University | | | | |
|   Public (ref) | -- | -- | -- | -- |
|   Private | -.042 | -.018 | **-.052*** | **-.174\*\*\*** |
| Year In University | | | | |
|   1st (ref) | -- | -- | -- | -- |
|   2nd | .009 | .009 | -.027 | -.001 |
|   3rd | **-.083*** | -.028 | **-.087\*\*** | -.033 |
|   4th | **-.064*** | **-.081\*\*** | **-.135\*\*\*** | -.055 |
| Region of Origin | | | | |
|   Local (ref) | -- | -- | -- | -- |
|   Out of town | -.022 | .015 | -.010 | **-.077\*\*** |
| In a Stable Relationship | | | | |
|   No (ref) | -- | -- | -- | -- |
|   Yes | .018 | **.093\*\*\*** | **.150\*\*\*** | -.001 |
| Disposable Income (NT$/Month) | | | | |
|   ≤ 4,000[a] (ref) | -- | -- | -- | -- |
|   4,001-8,000 | .044 | .054 | .033 | .006 |
|   8,001-12,000 | **.099*** | **.093*** | .040 | .079 |
|   ≥ 12,001 | .028 | .066 | .034 | .009 |
| Severity of Depression | | | | |
|   None (ref) | -- | -- | -- | -- |
|   Mild | **-.255\*\*\*** | **-.282\*\*\*** | **-.213\*\*\*** | **-.208\*\*\*** |
|   Moderate to severe | **-.349\*\*\*** | **-.421\*\*\*** | **-.273\*\*\*** | **-.274\*\*\*** |
| Diagnosed Mental Disorder[b] | | | | |
|   No (ref) | -- | -- | -- | -- |
|   Yes | -.004 | -.020 | **-.053*** | -.030 |
| IA Behavioral Manifestations | | | | |
|   Compulsivity | **-.096*** | **-.166\*\*\*** | -.074 | **-.088*** |
|   Withdrawal symptoms | -.016 | .005 | -.027 | .016 |
|   Tolerance | .022 | -.016 | .060 | .016 |
|   Interpersonal and health problems | **-.100\*\*** | -.042 | **-.163\*\*\*** | -.075 |
|   Time management problems | **-.083*** | -.011 | .021 | -.010 |

*β* standardized regression coefficient.

All models controlled for GPA, sexual orientation, having a religion, diagnosed physical disorder, and past-year heavy episodic drinking, smoking, and unprotected sex.

*p < .05, **p < .01, ***p < .001

[a]NT$4,000 is approximately US$135; €104; £89.

[b]Excludes depression and ADHD.

# Chapter 4　Discussion

The current study sought to bridge the gap in the existing literature on the relationships between IA and HRQOL in the college student population. It is worth noting that, although a consensus has yet to be reached regarding the key covariates of HRQOL among college students, this study took into consideration a number of background characteristics, health conditions, and risk behaviors that may affect their HRQOL. Even after controlling for these potential confounding factors, this study still found significant independent associations between IA and all domains of HRQOL. In addition, the analyses of IA behavioral manifestations also provided insights into how various aspects of IA impacted HRQOL in different domains.

## 4.1 Internet use and effects of Internet addiction on HRQOL among college students

This study found that IA significantly affected all 4 domains of HRQOL, indicating that IA is an important health risk factor among college students. As the Internet continues to fulfill the needs of information, entertainment, and social interactions, Internet use becomes a more intimate and indispensable part of our daily lives, especially for college students whose learning and social networking require Internet use. As demonstrated in this study, some college students were unable to stop

Internet use and developed IA, leading to reduced HRQOL. Therefore, IA prevention initiatives are urgently needed to help students maintain a delicate balance between Internet use and misuse. Research is also warranted to provide empirical evidence of effective intervention strategies. In addition, student counseling professionals should pay attention to students exhibiting IA symptoms and provide timely assistance. In view of that, IA screening using the CIAS screening criteria as in this study may be a pragmatic approach to help identify high-risk students for IA intervention.

## 4.2 Effects of Internet addiction behavioral manifestations on different domains of HRQOL

In addition to examining the associations between IA and HRQOL, the current study further explored the relationships between IA behavioral manifestations and all domains of HRQOL. First, this study found that "compulsivity," "interpersonal and health problems," and "time management problems" significantly affected college students' HRQOL in physical health. A possible explanation is that students with higher compulsivity may have impaired control over Internet usage, thereby developing the other two manifestations in health and time management problems, including physical inactivity, poor diets, and sleep deprivation, which may lead to lower HRQOL in physical health. This line of argument is corroborated by an auxiliary analysis, which found significant positive correlations among the aforementioned three behavioral
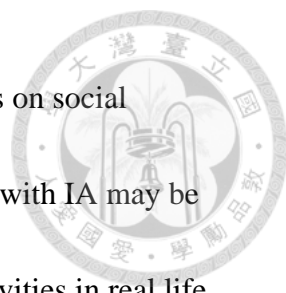
manifestations, suggesting that students with higher degrees of compulsivity also tend

to report having time management and consequently interpersonal and health problems

related to Internet use.

Further, "compulsivity" also had a strong impact on psychological HRQOL.

Similar to other compulsive disorders, compulsivity related to Internet use may cause

feelings of anxiety and such emotional responses can harm college students'

psychological HRQOL. Elevated "compulsivity" also affected HRQOL in the

environment domain, as college students with compulsivity manifestations may spend

larger expenditures on Internet-related activities (e.g., online games, cybersex chats) so

they may feel financially insufficient (i.e., a facet affecting environment HRQOL). In

view of the deleterious effects of "compulsivity" on various HRQOL domains,

intervention programs need to heighten college students' awareness of their potential

compulsive Internet use, and to provide guidance to facilitate better self-regulation. In

addition, since cognitive behavioral therapy (CBT) has been shown to be an effective

treatment for compulsive disorders (Young, 2009), mental health professionals may

consider offering CBT to college students with compulsivity manifestations to help

ameliorate the impact of IA on their HRQOL in these domains.

Lastly, students with greater "interpersonal and health problems" also reported

lower HRQOL in social relationships. Since these manifestations encompass

interpersonal problems, it is reasonable that they have adverse effects on social

relationships. Understandably, immersed in the cyberspace, students with IA may be

relatively more isolated from face-to-face interactions and social activities in real life,

thus affecting their HRQOL in social relationships. Conversely, students lacking

interpersonal skills may find solace in the cyberspace to escape from reality, which may

further exacerbate their IA and existing interpersonal problems, leading to a vicious

circle. Future research is warranted to elucidate this hypothesized relationship. More

intervention initiatives are also needed to help students enhance their interpersonal skills

and improve their HRQOL in social relationships.

## 4.3 Effects of Internet addiction and Internet addiction comorbidities on HRQOL

In an ancillary analysis (data not shown), chi-square comparisons found that IA

was significantly associated with both ADHD and severity of depression, corroborating

the comorbidity of ADHD and depression with IA as in prior research (Ko et al., 2008;

J. Y. Yen et al., 2009). Additional Cochran-Armitage trend test also found that as the

severity of depression increased, so did the risk of IA ($p < .001$). Considering that both

ADHD and depression significantly affected HRQOL, and that severity of depression

had the strongest negative effects on HRQOL across all 4 domains, the co-occurrence of

ADHD and depression with IA as demonstrated in this study, regardless of their specific

causal relationships, underscores the importance of incorporating IA as a risk factor in future investigations of college students' HRQOL. Notably, depression has been rated as the top leading cause of burden of disease in middle and high income countries (Chee & Ng, 2012), where people may have easier access and greater usage of the Internet and thus elevated risk of IA, suggesting the need for multi-component prevention initiatives to tackle IA and depression simultaneously to avoid the potential synergistic harmful effects of IA and depression on HRQOL.

## 4.4 The role of other background factors

First, this study found that male students had better physical health and poorer social relationships, which may be attributed to biological sex differences, lifestyles including physical activity, and patterns of social interactions. Understandably, those in a stable relationship also reported higher HRQOL in both the psychological and social relationships domains. In addition, college students attending a private rather than public university had lower HRQOL in the social relationships and environment domains, possibly due to differences in campus atmosphere and environment. Students from out of town also had lower HRQOL in the environment domain, suggesting that they may be relatively unfamiliar with the environment and have fewer local resources. Moreover, college students in junior and senior years reported lower HRQOL in all domains, except environment, possibly resulting from increased academic and career

pressure and unhealthier lifestyles. Further, those engaging in HED in the past year

reported lower HRQOL in environment, perhaps due to higher expenditure on alcohol,

thereby decreasing their disposable financial resources that could be allocated to

improve the quality of their environment (e.g., living conditions, transportation, etc.).

Lastly, those with diagnosed mental disorders reported lower HRQOL in social

relationships, possibly owing to their self-inflicted isolation or social ostracism by

peers. In sum, on the basis of the empirical findings from this study, more effective

intervention programs could be devised to help improve college students' HRQOL.

## 4.5 Limitations and future directions

There are some limitations to this study. First, since the current study relied on

self-report, there are common issues that self-administered surveys would encounter

such as potential reporting bias. However, this survey employed empirically validated

measures for our main study variables, and a pilot test was also conducted to ensure

clarity and appropriateness of survey items. Hence, concerns about reporting bias are

likely to be minimal. Second, this study recruited college students from two universities,

which may limit the generalizability of our findings to the entire college student

population. Nonetheless, given that the two purposely selected universities are

comparable in many aspects using proportional stratified cluster sampling to draw

participants, and that an extensive set of key background variables were included in the

multivariate analyses to control for potential confounding effects and to enhance the internal validity of the research findings, the independent associations found between IA and all domains of HRQOL in this study underscore the importance of IA as a major health concern among college students. Future research may consider drawing a larger national sample and examine if our study findings could be replicated. Lastly, the cross-sectional design constrains our ability to make causal inferences. Therefore, future longitudinal research is needed to confirm their temporal relationships and to illuminate the underlying mechanisms between IA and HRQOL.

# Chapter 5 Conclusions

This study aimed to bridge the gap in the current literature on the relationships between IA and HRQOL among college students in Taiwan. The present study demonstrated that IA had significant negative associations with all aspects of HRQOL in this population. Further, this study illustrated how various IA behavioral manifestations might affect HRQOL in different domains; specifically, "compulsivity," "interpersonal and health problems," and "time management problems" were found significantly associated with decreased HRQOL in various domains. These findings highlight the importance of IA as a major health concern among college students, and lend support to the inclusion of IA in developing health education and intervention initiatives to improve HRQOL in the college student population. Considering that Internet use has permeated into our daily lives, more research is warranted to elucidate the mechanisms of how IA affects our HRQOL, and to facilitate the development of optimally effective programs to prevent the negative effects of Internet use on HRQOL.

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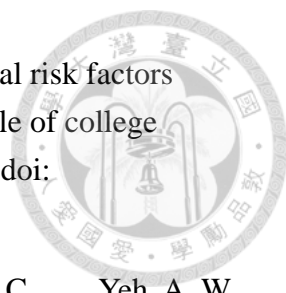
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# 附錄

## 壹、研究背景與動機

　　無論是吸菸、飲酒或物質使用，各式各樣之成癮行為，均有害於人們的健康。成癮者為了尋求快樂或減輕戒斷症狀之痛苦，不計代價地反覆從事這些成癮行為。近來有研究發現，有部分族群在使用網路時，失去自我控制的能力，並產生類似成癮於網路的現象。這種新興之成癮行為，讓心理、精神領域之學者們感到好奇，並開始討論是否真有存在網路成癮，以及其對人類健康可能之衝擊。

　　不可諱言，網路已逐漸成為現代人生活型態之一部分，尤其在青少年族群中，網路可近性高，加上其心理狀態尚未完全成熟，因而被學者們認為是網路成癮之高風險族群。另外，在各國之相關研究中，均顯示有一定比例之青少年具有網路成癮之現象，顯示有關青少年族群網路成癮之議題，有其探討之必要。然而，雖在過去之青少年族群研究中，發現許多與網路成癮顯著相關之負向健康危害，目前文獻中仍缺少以系統性之調查，探討網路成癮對青少年族群整體健康造成之衝擊。有鑑於網路使用已遍及青少年族群學業、休閒及社交生活之中，並逐漸形塑出另一種新興之網路時代生活模式，有關於網路成癮可能對青少年族群整體健康相關生活品質之影響，亟須有研究進行調查，以提供未來研擬網路成癮介入計畫之實證依據。

## 貳、文獻回顧

### 一、 網路成癮之回顧與定義

　　傳統上，心理精神學界所定義之「成癮」，係指個人於使用成癮物質後，造成其腦內結構或訊息傳遞方式改變，致使其產生對該成癮物質之渴求。但學者發現，即便在沒有使用成癮物質之情況下，某些行為亦可導致人們產生類似之成癮症狀，於是便開始發展有關「行為成癮」之概念。而近年來，最受學界關注的成癮行為之一，即係伴隨著網路使用所導致之「網路成癮」。回顧先前國外之研究發現，學者們曾以「Internet Addiction」、「Internet Addiction Disorder」、「Pathological Internet Use」、「Excessive Internet Use」以及「Compulsive Internet Use」等名詞指涉此一成癮現象[1]，然而，從專有名詞不一之現象可知，學界對此一新興成癮行為之形成機轉，目前仍尚無共識。在本研究之內文中，研究者將使用「網路成癮」 (Internet Addiction) 一詞稱之。

　　最早於 1995 年，美國精神科醫師暨臨床精神藥理學家 Goldberg 發現其病患有類似於網路成癮之現象，當時他依循精神疾病診斷與統計手冊 (Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition, DSM-IV) 中之物質依賴，擬定出診斷網路成癮之標準，並界定對於網路使用成癮的人，可能會具有類似物質成癮之症狀，例如有網路使用耐受性、當停止使用網路時會產生戒斷症狀、上網時間超過預期、以及因網路使用而放棄重要社交或娛樂活動…等[2]。隔年，學者 Young 亦發表有關於網路成癮之研究；有別於 Goldberg 之定義，她認為網路成癮類似於 DSM-IV 中之「病態性賭博」，係起因於衝動控制異常之問題，因此，Young 以病態性賭博之診斷標準為基礎，定義網路成癮患者之症狀[3]。學者 Kandell 將網路成癮視為一種「個人對網路之心理依賴」，且無論成癮者係使用何種網路功能。他定義網路成癮者會具有下述四項特性：1) 思緒逐漸為使用網路而占據，並且會投資個人時間、精力以及金錢於網路活動上；2) 沒有上網時，會有不安或不愉悅

之情緒，例如焦慮、憂鬱、無意義或寂寞；3) 對網路之耐受程度越來越強；4) 否認其因網路使用導致之問題[4]。他認為，網路成癮是個人分散注意力於日常心理壓力上的表現，例如人際關係、工作困難、自我認同不適或是分離焦慮等，然，逃遁到網路世界卻只是讓人暫時避免面對上述問題，並可能讓問題更趨嚴重。

另一方面，亦有學者對於將網路成癮視為一具有特異性之新興精神疾病，抱持較保留之態度。例如，學者 Mark Griffith 就曾在其研究中，提到他認為網路成癮者可能是透過網路媒介發展並表現其它潛在之成癮傾向，而並非成癮於使用網路之行為[5]。綜觀以上，關於網路成癮是否為一新興並具特異性之成癮行為，目前尚未釐清，然吾人已可確定的是，在今日網路盛行之環境中，人們正面臨一項過去未曾暴露之健康風險中。因此，網路成癮可能會造成人們健康之危害，亟需有相關研究加以探討。

## 二、 網路成癮相關測量工具

回顧國外之相關研究，有關網路成癮之測量工具，較常見者即為學者 Young 所訂定之 Young's Diagnostic Questionnaire (YDQ)，該問卷以 DSM-IV 之病態性賭博為依據改編，認定若在八項成癮特徵中，具有五項或五項以上者，即代表其有網路成癮[3]；而後為了同時評估成癮者受網路成癮之影響，Young 更另外增加了 12 項題目，修訂原先之 YDQ，並命名為 Internet Addiction Test (IAT)[6]。其它之網路成癮測量工具，尚有 Morahan-Martin 和 Schumacher 研發之 Pathological Use Scale，共有 13 題，內容主要是測量網路成癮所造成之負面影響[7, 8]；Brenner 所擬定之 Internet-Related Addictive Behavior Inventory (IRABI)則是以 32 題是非題，測量個人是否有類似於物質濫用之網路成癮經驗[9]；此外，也有研究係透過臨床醫師之診斷，作為網路成癮之測量。

回顧國內之研究，最常被研究用作為測量網路成癮之工具，即為中文網路成癮量表（Chen's Internet Addiction Scale，CIAS）[10-13]。該量表主要測量填答者之網路成癮之五項行為表徵：「強迫性上網」、「網路成癮戒斷反應」與「網路成癮耐

受性」、「人際與健康問題」與「時間管理問題」。進一步，該量表之心理計量測量
已經實證研究驗證，指出其為網路成癮良好之測量工具[14]。進一步，該量表亦已
建立於不同年齡層之族群之診斷標準[15-17]，又有供作大學生族群之良好切點[15]，
故被研究者選為本研究測量網路成癮之測量工具。

## 三、 大學生族群網路成癮之易感性與盛行率

　　學者 Kandell 在文獻中指出，屬於青少年後期之大學生族群，其心理狀態不穩
定、網路可近性高以及求學過程中使用網路之必要性，使其具有較高之網路成癮
風險[4]。在美國有關大學生網路成癮之研究中發現，其盛行率為 8.1%與 12%[7, 18]，
而英國、土耳其之研究則分別報告為 18.3% [19]與 9.7% [20]。反觀臺灣，在研究
大學生族群網路成癮之相關文獻中，網路成癮盛行率係介於 12.9%至 17.9%之間[11,
12, 21]，顯示臺灣亦有部分大學生具有網路成癮之情形。雖然各國研究之測量工具
可能不盡相同，但各國之研究結果均發現大學生有網路成癮之情形，突顯出網路
成癮並非為特定地區之單一個案，而是一跨文化之重要健康議題。

## 四、 可能與網路成癮相關之背景變項

　　回顧過去文獻，與網路成癮相關之社會人口學變項，主要發現有性別、學業
成績。性別上，多數研究發現男性之網路成癮比例顯著高於女性[7, 11, 12, 22]；此
外，雖然因果時序性未明，網路成癮亦被研究發現與較差之學業成績成顯著相關[11,
19, 23]，為避免上述變項可能影響網路成癮與健康相關生活品質之關聯性分析，本
研究中會將其納入控制。另一方面，根據國外大學生健康危害行為調查，大學生
族群中常發生過量飲酒、危險性行為以及吸菸等健康危害行為[24]，又，根據青少
年問題行為理論指出，問題行為往往會共伴發生，影響大學生之健康相關生活品
質[25]。考量到網路成癮此一問題行為，亦可能與其他危險行為有共伴出現之可能，
本研究亦另外納入吸菸、狂飲、危險性行為以作控制。

## 五、 青少年族群網路成癮之相關健康危害

目前有關網路成癮造成之健康危害，多聚焦於與網路成癮相關之心理疾患上。研究中曾指出，網路成癮與注意力缺乏/過動症 (Attention-deficit/hyperactivity disorder, ADHD) 與憂鬱症，具有潛藏之共病現象。意即當某人被發現具有網路成癮之症狀時，此兩種心理疾患往往也會一併被發現[11, 21, 26]。國內一篇調查大學生族群之研究指出，在控制性別與年齡後，具有 ADHD 傾向之學生，網路成癮之風險較高，其風險比值 (Odds Ratio, OR) 為 2.84 倍[21]。其次，在 Lin 等學者所發表之研究中指出，大學生之憂鬱症與網路成癮具統計顯著之關聯，且於多元迴歸模型篩選時，憂鬱症分數為最先進入模型之變項，顯示其為網路成癮之重要相關因子[11]。此外，無論是使用不同之測量方法[26]，或是針對不同族群[27]，均發現網路成癮與此兩者心理疾患具有顯著關聯，顯示出網路成癮可能會造成個人心理健康方面之危害。

此外，網路成癮之青少年可能因其對網路有強迫性使用之情況，進而導致其具有較不健康之生活型態。例如，一篇土耳其之研究指出，大學生之網路成癮顯著與其使用網路之時段有關。經常在半夜使用網路之學生，其網路成癮之傾向顯著較高[22]。另，針對臺灣某大學之大一新生的研究報告中亦發現，相較於沒有網路成癮之學生，具網路成癮者正常吃早餐之頻率顯著較低；而作者亦將此結果聯結至學生熬夜上網所致，並指出其可能會影響到學生之學業表現[12]。更有甚者，網路成癮之青少年曾被發現可能有較差之生活滿意度，在一篇於 2011 年發表之中國研究中發現，具有網路成癮之青少年，無論在家庭、朋友、學校、居住環境以及自我滿意度方面，全面地具有顯著較低之得分。進一步，在多變項分析之結果中，青少年之網路成癮，亦與其各面向之生活滿意度呈顯著之負相關，顯示出網路成癮可能會影響青少年族群全面之生活滿意度[28]。

綜觀上述，網路成癮對青少年族群造成之健康危害，廣泛地涉及其心理、生活型態及生活滿意度等不同層面之上，然而，先前之研究僅調查網路成癮對青少

年族群特定健康問題之影響，而有關於全面地探討網路成癮可能對青少年整體健康之研究，目前仍較少有研究提供實證依據。

## 六、 網路成癮與健康相關生活品質

從上述之文獻可知，網路成癮可能對青少年族群健康造成之危害甚多，超越其個人健康、生活型態，同時還可能會影響個人對其社會關係之滿意度。根據世界衛生組織對健康之定義，個人必須同時達到生理、心理與社會層面之安寧美好狀態，才算滿足完整之健康定義[29]，換言之，網路成癮可能對青少年族群健康之衝擊，亦應具有較全面地考量，而非侷限在特定疾病或健康問題上。有關於上述較完整之健康定義，世界衛生組織特地研擬了生活品質問卷 (World Health Organization Quality of Life, WHOQOL)，該問卷內容包含了生理、心理、社會關係以及環境等四大健康範疇，試圖以較全觀性之視角檢視個人之健康狀況，並作為測量健康之終極指標。而近來亦有成癮領域之研究者認為，因為成癮症對病患所造成之影響，擴及其生活中許多層面，因此針對成癮症之處遇，應該著重於提升其整體之生活品質。而相關之成癮症研究，亦應以健康相關生活品質作為指標，測量其對病患之衝擊[30]。隨著成癮研究之意識形態轉變，未來研究將會愈來愈重視成癮行為對個人生活品質之影響，故，有關大學生族群網路成癮與其健康相關生活品質之關係，值得我們進一步探究。

## 七、 研究問題與重要性

綜上所述，網路成癮係一新興之行為成癮現象，並於各國之實證研究中，均報告有一定比例之青少年受其衝擊；此外，研究報告亦指出，網路成癮與其許多負向健康危害具顯著關聯。然而，目前卻鮮少有研究以系統性之方式，探討網路成癮對青少年族群整體健康狀況之影響，甚至，未見有研究以健康相關生活品質此一測量整體健康之指標，來檢視網路成癮對青少年族群之衝擊。有鑑於此，本研究欲以大學生族群為研究對象，並採用較為全面性之研究工具，進行有關網路

成癮與其健康相關生活之探討。本研究之主要研究目如下：

(一) 瞭解樣本中大學生之網路成癮盛行率為何；

(二) 瞭解樣本中大學生之整體健康相關生活品質為何；

(三) 分析樣本中大學生網路成癮與不同範疇之健康相關生活品質的關聯。

希望透過本研究，可以進一步釐清於青少年族群網路成癮與其健康相關生活品質之關係。

## 參、研究方法

### 一、 資料收集

本研究採用橫斷式研究，並以自填式量性問卷為研究工具。為了確保樣本在學校特性與學院上之多元性，研究者特別選定臺灣北部公、私立各一所綜合型大學，並以此兩所大學全體之日間部學生，作為本研究之抽樣母體。抽樣方式係採用等比例分層集束抽樣（stratified proportional cluster sampling），先以學校特性（公、私立）與學院別人數，作為各層樣本配額之比例，再以系必修課為集束單位進行隨機抽樣。本研究共發放紙本問卷 1,600 份，而後回收 1,452 份，回覆率為 90.8%（1,452/1,600）。

### 二、 研究測量工具

本研究針對所抽出必修課之修課大學生，發放紙本之自填式量性問卷。問卷內容可分為三大部分：網路成癮、健康相關生活品質以及其他背景控制變項，其中，背景控制變項包含有：社會人口學變項、健康危害行為及與網路成癮相關之心理疾患。上述變項之操作型定義敘述於下：

#### 1. 網路成癮

本研究使用「中文網路成癮量表」作為對大學生網路成癮之測量，此量表共有 26 題，為一四點式之類立克氏量表。該量表可區分為五項分量表，分別描述網路成癮不同之行為表徵，包含「強迫性」、「戒斷症狀」、「耐受性」、「人際與健康問題」及「時間管理問題」[14]。依據文獻指出，量表總分大於 64 分以上者，為到達網路成癮篩選標準者；而量表總分大於 68 分以上，為到達網路成癮診斷標準者[15]。基於本研究為一社區型研究（community-based research），我們以網路成癮之篩選標準測量研究參與者之網路成癮；此外，因為文獻中尚無針對五項網路成癮之切點，故於本研究之統計分析中，分別以各分量表之總分，建構五項測量網

39

路成癮行為表徵之連續變項。

**2. 健康相關生活品質**

本研究使用世界衛生組織生活品質問卷簡明版「WHOQOL-BREF Taiwan Version」作為測量健康相關生活品質之工具[31]。此量表係由世界衛生組織所發展，而後經臺灣學者進行本土適用性之研究，修編為適用於臺灣民眾，且信、效度良好之臺灣版本[31, 32]。本工具共有 28 題，其中 26 題包含「生理健康」、「心理」、「社會關係」及「環境」四大範疇之健康相關生活品質，答題選項為五點式選項。本研究依據使用手冊[33]，將四大範疇各自計分，總分介於 4 至 20 分之間。得分較高之參與者，表示其在該範疇之健康相關生活品質較佳。

**3. 背景控制變項**

本研究之背景控制變項共有三大類：人口學變項、健康危害行為及與網路成癮相關之心理共病疾患，各類變項之定義與測量依序於以下介紹之：

**社會人口學變項**

性別、學校類型（公、私立）、就讀之年級、學業成績（前一學期於班上之成績排名百分比）、本地學生／外地學生、感情狀態（過去一年是否曾有穩定交往之對象）、性傾向（過去曾喜歡過的對象為異性／非異性）、是否有宗教信仰、每月可支配收入。

**健康危害行為**

詢問參與者過去一年內是否曾經研「吸菸」、「狂飲」（定義為在數小時內，接續地喝下五份或更多之酒精類飲品）及「危險性行為」（發生性行為時是否有使用保險套）。

**與網路成癮相關之心理共病疾患**

研究中，注意力缺乏/過動症之測量，係採用中文版成人注意力缺乏/過動症自我評量表（Adult ADHD Self-Report Scale, ASRS），該量表共有六題，符合各題標準

者得 1 分，總分為 0 至 6 分。依據文獻之建議，若得分大於 3 分者，將被本研究定義為具有注意力缺乏/過動症者之大學生[34]，其量表在本研究之內在一致信度（Cronbach's α）為 0.69。此外，本研究使用中文版病人健康問卷 (Patient Health Questionnaire, PHQ-9)作為測量大學生憂鬱程度之工具。該量表共有 9 題，總分介於 0 至 27 分。依據過去文獻之建議，問卷總分依 5、10、15、20 四個切割點，可區分出「正常」、「輕微」、「中度」、「中等嚴重」及「重度」之憂鬱程度[35]。然而，因最後兩類之細格數過少，本研究將其整併成「正常」、「輕微」及「中度至重度」之類別變項。此量表在本研究之內在一致信度（Cronbach's α）為 0.82。
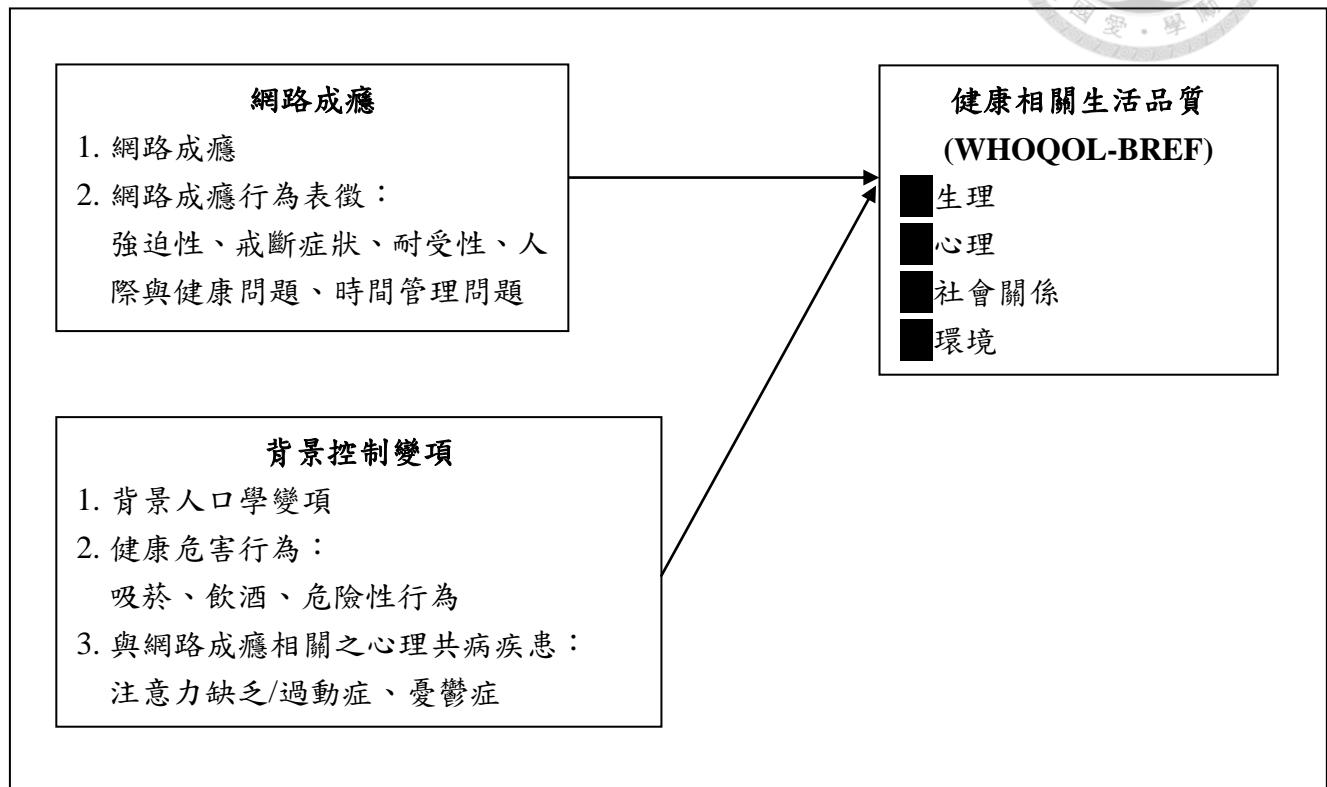
## 三、 資料分析

本研究將以 SPSS 17.0 對所得資料進行資料處理與分析。首先，以次數分配或百分比描述樣本之背景控制變項分佈，並檢視其與四大範疇健康相關生活品質之關係。其次，檢視樣本大學生之網路成癮（類別變項）與五項網路成癮行為表徵（連續變項），與其四大範疇之健康相關生活品質之關係。最後，本研究分別針對網路成癮與網路成癮行為表徵，建立兩組平行之多元線性迴歸模型，其目的是分別在納入背景控制變項後，檢視網路成癮與網路成癮行為表徵，與樣本大學生四大範疇之健康相關生活品質之關聯。本研究中所有分析之顯著水準為 0.05。

## 四、 研究架構

依據上述之文獻回顧與本研究之主要研究目的，可畫出研究架構如下：

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