

Influence of Different Facets of Internet Addiction on Subjective Well-being in Malaysia: A Comparison Across Ethnic Groups

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ABSTRACT

Despite a growing awareness that internet addiction is becoming a significant public health issue, there is limited research on how multiple facets of internet addiction relates to the humanistic concepts of well-being, particularly those captured in Diener's three subjective well-being dimensions: life satisfaction, positive affect, and negative affect across ethnic groups. Thus, this study aimed to investigate the relationship between different facets of internet addiction and the three subjective well-being dimensions in Malaysia. The research work also sought to investigate if the relationship operates equivalently across ethnic groups. Malaysians ($n = 400$, 66.5% female; age in years $M = 24.52$, $SD = 5.7$) completed Satisfaction with Life Scale and the PANAS. Structural equation modelling was used to examine these associations. Results showed that six facets of internet addiction, such as mood modification, impaired control, conflict, preoccupation, tolerance, and withdrawal, were significant predictors of lower subjective well-being on almost all scales across the total sample size. Invariances analyses also indicated that there were a few significant ethnic differences across these predictors for subjective well-being. The findings highlight the importance of efforts to reduce various characteristic symptoms of internet addiction to mitigate its harmful effects on subjective well-being across ethnic groups in Malaysia.

Keywords: *Internet addiction, subjective well-being, ethnic groups, Malaysia, multidimensional.*

INTRODUCTION

Addiction disorder is a powerful and destructive condition that affects large segments of the population around the world. While usually connected with substances such as alcohol, drugs, and tobacco, internet addiction (IA) has become a major concern for the coming years, as internet use and availability has become immensely popular. IA ruins lives by causing psychological disturbances, neurological complications, and social concerns. Some studies which focused on IA found its negative impact in the form of poor mental health (Yoo et al., 2014), lower self-esteem (Chun, 2016), insomnia, stress, and anxiety (Hanprathet et al., 2015), unhappiness, depression, suicidal ideation, and self-harm (Akin, 2012; Ang et al., 2012). Additionally, IA is a consequence of deteriorated subjective well-being (SWB) amongst individuals.

Literature findings have revealed a significant relationship with IA, and three facets of SWB, including positive affect (PA), negative affect (NA), and life satisfaction (SWLS). For example, Koç (2017) reported on the relationship between IA and SWB indicators amongst university students. The findings of this study elucidated that PA and SWLS predicted IA negatively, but NA positively predicted IA. Some authors considered have stated that there is a negative relationship between cognitive impairment in problematic internet use, and

SWB, including emotional elements, SWLS, and self-esteem (Senol-Durak & Durak, 2011). Akin (2012) found that IA poses a potential risk factor for low levels of subjective happiness. Telef (2015) also found that the negative relationships between IA and families, as well as school satisfaction rates amongst Turkish adolescents, depicted a significant positive association between IA and NA.

Nevertheless, a good amount of scientific work has investigated the relationship between IA and SWB, but this is still insufficient. From a scientific perspective, the debate continues about whether IA is best understood as a uni- or a multidimensional construct, and if it is to be held responsible for the degradation of SWB. In most SWB studies so far, IA has been explicitly or implicitly viewed as a supposedly uniform entity and a one-dimensional construct. However, a closer look revealed that the diagnostic criteria for IA consist of several behavioral symptoms such as preoccupation, conflict, withdrawal features, and tolerance, which have stimulated a plea for its inclusion in the Statistical Manual of Mental Disorder 5th Edition (DSM-V). Thus, this study attempts to conduct a comprehensive investigation of the relationship between the facets of IA, and the three facets of SWB in Malaysia.

Malaysia is a multi-ethnic country in South-East Asia, with a population of 32 million people (Department of Statistics Malaysia, 2018). It is not without the negative effects of technological advancement (Hazita et al., 2014; Mahyuddin & Juriah, 2017). As the country is arguably one of the most tech-savvy societies, this comes with a price. Based on a three-stage survey by the Malaysian Communication and Multimedia Commission (2017), internet dependency amongst Malaysians have reached an alarming rate, placing the country amongst those with the highest rates of IA in the Asia-Pacific region. In the first stage of this survey carried out across 725 respondents, the results showed that the internet forms a significant part of life, with over 89 per cent of the respondents reported to being addicted to the internet. Besides, 32 per cent suffered from clinical depression, and 60 per cent of them showed raised levels of anxiety. One study amongst adolescents across six Asian countries (i.e. China, Hong Kong, Japan, South Korea, Malaysia, and the Philippines) showed a much greater prevalence of IA in Malaysia (Mak et al., 2014). Furthermore, a cross-sectional survey across five ASEAN countries found that amongst these countries, the highest prevalence of IA was Thailand, followed by Indonesia, Vietnam, Malaysia, and Myanmar (Turnbull et al., 2018). Malaysia also has a relatively high rate of internet users across different ethnic groups (Rohaya et al., 2013; Soh et al., 2011).

Although there have been numerous studies conducted to demonstrate the diagnostic criteria for IA from a Malaysian context, the consequences of IA remain unidentified. The association between IA and SWB, in particular, has been a topic that needs to be addressed by Malaysian researchers. Malaysia can provide an interesting case study for investigating these relationships across ethnic groups, with possible lessons and clinical implications for other multi-ethnic and multicultural countries (Syarizan et al., 2019). Nevertheless, a previous study in Malaysia examined the association between SWLS and IA amongst young adults (Wong et al., 2016). Thus, the first aim of this study is to investigate the association between different facets of IA and three facets of SWB based on a Malaysian population. In Malaysia, an ethnic group with a distinctive set of values and behavior, provides the basis which significantly affects their internet use, as it constitutes a subculture (Norsiah et al., 2016; Sirkeci, 2009). Thus, it is also important for researchers to realize the cultural uniqueness to bring value to a specific segment (Mooij, 2018). Nevertheless, we expect that,

based on the results by Lindridge, Henderson, and Ekpo (2015), the effect of internet use on well-being may differ across the ethnic group. This leads to our second goal, which was to examine if there differences across ethnic groups in the power of the relationship between IAD and SWB, within the context of Malaysia.

METHODOLOGY

Participants

400 participants completed the questionnaire. The participants were selected randomly from four states in Malaysia. Approximately 100 participants made up each of these states. Stratified random sampling was performed to ensure that the current proportion of ethnicities in Malaysia represented the participants. Drawing on the Department of Statistics Malaysia (2018) the ethnic group in Malaysia was made up of almost 56% Malays, 23% Chinese, 14% Sabahans and Sarawakians, and 7% Indians. In essence, this constitutes 222 samples which were identified as Malays, 94 samples as Chinese, 56 samples as Sabahans and Sarawakians, and 28 were Indians. In this study, 66.5 % of the participants were female.

In Malaysia, heavy internet users are individuals, aged between 20 and 40 (MCMC, 2017). Therefore, in this study, we focused on participants who were youths and young adults aged between 20–40 years. A total of 41.3% of the participants formed the 21-25 age group, followed by those in the age group below 20 years 26.5% (106), ages 26-30 (16.8%), and above 31 years of age (16.85). The mean score recorded for the age group was 24.5 years. The participants who volunteered for this study were provided with self-administered questionnaires, which were collected on the same day. All participants provided informed consent before completing the survey. The survey took approximately 20 minutes to complete, and the process of data collection took place between January to August 2019. Additional characteristics of the participation samples mean, and standard deviations for each of the constructs are presented in Table 1, across the ethnic groups.

Table 1: Means and standard deviations for each of the variables

| | Total | Malay | Chinese | Indian | Sabahan/ Sarawakian |
|-----------------------|--------------|---------------|----------------|---------------|--------------------------------|
| N | 400 | 222 | 94 | 28 | 56 |
| Age | 24.52 (5.7) | 25.23 (6.187) | 22.70 (4.8) | 25.32 (4.83) | 24.37 (4.98) |
| Ethnic groups (%) | | 55.5 | 23.5 | 7 | 14 |
| Gender (% female) | 66.5 | 72.5 | 51.1 | 46.4 | 78.6 |
| SWLS | 4.57 (1.07) | 4.34 (1.09) | 3.94 (1.08) | 4.29 (1.15) | 4.234(1.48) |
| Positive affect | 2.97 (.64) | 3.03 (.64) | 2.93 (.65) | 2.99(.55) | 2.842 (.65) |
| Negative affect | 2.87 (.62) | 2.92 (.61) | 2.85 (.66) | 2.85(.55) | 2.72 (.63) |
| IA | | | | | |
| Preoccupation | 2.39 (1.27) | 2.26 (1.28) | 2.61 (1.202) | 3.03 (1.17) | 2.23 (1.29) |
| Tolerance | 2.47 (1.33) | 2.23 (1.31) | 2.82 (1.34) | 2.78 (1.17) | 2.45 (1.49) |
| Withdrawal | 3.6 (1.96) | 3.64 (1.42) | 3.32 (1.21) | 3.82 (1.28) | 3.80 (4.26) |
| Mood modification | 4.92 (1.64) | 4.95 (1.59) | 4.82 (1.59) | 5.07 (1.69) | 4.87 (1.89) |
| Impaired control | 3.43 (1.29) | 3.43 (1.29) | 3.55 (1.22) | 3.39 (1.26) | 3.34 (1.41) |
| Conflict | 2.92 (1.16) | 2.84 (1.12) | 2.21 (1.23) | 2.39 (1.34) | 1.55 (.93) |
| Functional Impairment | 2.96 (1.20) | 2.82 (1.09) | 2.36 (1.34) | 2.39 (1.34) | 1.66 (1.12) |

Measures

Participants in the study completed the questionnaires, along with the Internet Addiction Questionnaire (IAQ), including questionnaires on the Satisfaction With Life Scale (SWLS), and the Positive and Negative Affect Schedule (PANAS). The study was cross-sectional in design. Internet addiction disorder questionnaire

To date, a variety of IAQ has been used to determine the IA criteria. This variation exists due to the lack of agreement in defining studies that examined the various behavioral symptoms and signs for IA. In this study, we used the term disorder over similar terms like dependence, or addiction, because it puts the clinical disorder at the center of focus. It would therefore not be confused with informal understandings of addiction. It is also more in agreement with current notions of disorders, rather than the dependence on DSM-5. Dependence may be confused with chemically involved development of withdrawal and tolerance, which do not occur for behavioral addictions. Thus, IAQ was represented by seven criteria describe best in such an order: preoccupation with internet (e.g., "I always think about the internet, when I am not using it"; DiNicola, 2004), non-chemical tolerance (e.g., "the time I spend online has increased over night more than sleeping"; Widyanto & Griffiths, 2007), withdrawal (I feel left out when I am not browsing the internet even for while"; Widyanto & Griffiths, 2007), impaired control (e.g., "I found that I use the internet longer than I intended"; Lu & Yeo, 2015), conflict (e.g., "I neglect my daily responsibilities because you prefer to go on the internet"; Widyanto & Griffiths, 2007), functional impairment (e.g., "my work/study performance is reduced because I spend a lot of time on the internet"; Ferraro et al. , 2006), and mood modification (escapisms) (i.e., "internet usage leaves a good impression on my current life and relief me from negative feeling"; Widyanto & Griffiths, 2007). The response format was that of a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). In this study, the alpha value of the overall sample was 0.693, while those of the Malay, Chinese, India, and Sabahans and Sarawakians were 0.70, 0.772, 0.736, and 0.682 respectively.

Subjective Well-Being

SWB was represented by three latent constructs — SWLS, PA, and NA. The multi-item measures were used to assess the internet user's SWLS which was applied in the study conducted by Leelakulthanit (2013) and Leelakulthanit, Day, and Walters (1991). The measures were carried out for satisfaction with social life, family life, work-life, personal health, recreation, spiritual life, and self-development. In this study, the alpha value for the overall sample size was 0.808.

The Positive and Negative Affect Schedule (PANAS) is an instrument invented by Watson, Clark, and Tellegen (1988), for evaluating PA and NA. The Cronbach's coefficient, α , was 0.766 for PA, and 0.844 for NA. Each item of PANAS was scored on a scale of 1 to 5.

ANALYSES

First, correlations across the symptoms of IA and SWB were examined separately for the subgroups within each ethnicity (Malay, Chinese, Indian, and Sabahans and Sarawakians). Second, we performed a confirmatory factor analysis (CFA) and structural equation modelling (SEM) with AMOS 23 software. We dealt with missing data by using a maximum likelihood estimation. In the model, the seven the symptoms of IA, represented by manifest

constructs, were simultaneous predictors of the three latent constructs, which reflected SWB (SWLS, PS, NA; see Figure 1). IA domains were represented by manifest constructs, rather than latent constructs, to minimize the number of parameters employed at the intermediate stages of the estimation of the parameter itself, thus, confirming the sufficient power when the sample was split into four ethnic groups.

In the third part of the analysis, a Multi-sample Structural Equation Modeling (MSEM) was conducted to evaluate the equivalency of the factor-to-factor pathways between the ethnic groups. For all model comparisons - one for each group, a single Chi2 goodness-of-fit statistic was used. To confirm the normal assumption that the groups were equal, subsamples needed to have the same estimates for a fully constrained model. The constraints were located in a sequence of nested models:

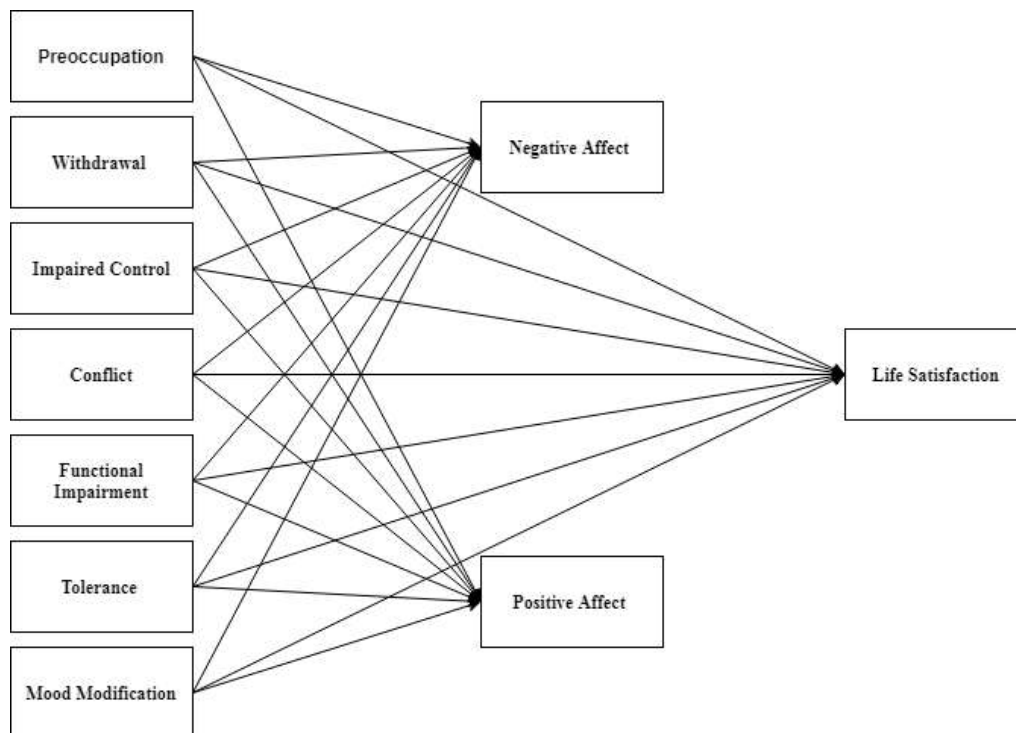


Figure 1: Research Model

RESULTS

Single-Sample Structural Equation Model

In the first stage of the analysis, CFA was estimated for each sample. CFA determined the suitability of the study's measures in representing their associated constructs using the latent and manifested constructs, as shown by the questionnaire items relating to each construct. Besides, factor correlations for all constructs in each sample are presented in Table 2 and 3. All factors correlations varied significantly, providing solid evidence for the discriminant validity of the constructs in this study. Given the suitability of CFA, SEM was used for specifying the structural association between the constructs (Figure 1). The goodness of fit of the model was acceptable across the total sample size ($\chi^2 = 255.751$, $df = 117$, $\chi^2/df = 2.186$, $GFI = .949$, $RMSEA = .055$, $IFI = .950$, $CFI = .920$). Nevertheless, modification indices showed that the model fit could be significantly corrected via the removal of six SWLS items. After eliminating these items, the loading factor from each construct was fairly large (ranging

from 0.54 to 0.84), and significantly better than zero ($p > .01$), thus providing solid evidence of convergent validity.

Standardized regression coefficients from the symptoms of IA to the SWB dimensions are presented in Table 4. Across the total sample, mood modification was a significant negative predictor of SWLS and PA. Tolerance was also a significant positive predictor of NA. Besides, tolerance, preoccupation with the internet, withdrawal, and functional impairment had significant negative effects on PA. Impaired control also had a significant negative effect on SWLS. Mood modification showed a significant positive influence on NA. As a summary, SWLS, NA, and PA intended persistence were each well-predicted in the model ($R^2=.498, .158, \text{ and } .497$, respectively).

Table 2: Factor correlation coefficients for Malay (222) and Chinese (99)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1.SWLS | - | .523 | -.283 | -.515 | -.360 | -.212 | .514 | -.398 | -.311 | -.316 |
| 2.PA | .794 | - | -.258 | -.523 | -.470 | -.494 | .694 | -.334 | -.335 | -.379 |
| 3.NA | -.102 | -.023 | - | .427 | .290 | .255 | -.036 | .279 | .293 | .416 |
| 4.Preoccupation | -.176 | -.201 | .201 | - | .618 | .346 | -.242 | .369 | .586 | .482 |
| 5.Tolerance | -.173 | -.131 | .344 | .515 | - | .199 | -.256 | .294 | .366 | .429 |
| 6.Withdrawal | -.299 | -.310 | .132 | .226 | .131 | - | -.191 | .438 | .314 | .391 |
| 7.Mood modification | .622 | .681 | -.103 | -.146 | -.037 | .296 | - | .189 | .080 | .482 |
| 8.Impaired control | -.277 | -.245 | .198 | .364 | .32 | .603 | -.219 | - | .462 | .342 |
| 9.Conflict | -.192 | -.031 | .313 | .526 | .511 | .137 | -.019 | .265 | - | .524 |
| 10.Functional Impairment | -.107 | -.058 | .243 | .294 | .419 | .044 | -.002 | .062 | .473 | - |

Note: Values below diagonal are from Malay; Values above diagonal are from Chinese; Correlations are statistically significant, $p < .001$.

Table 3: Factor correlations coefficients for Indian (28), and Sabahans and Sarawakians (56)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|--------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| 1. SWLS | - | .877 | -.146 | -.443 | -.134 | -.179 | -.784 | -.386 | -.289 | -.217 |
| 2. PA | .607 | - | -.132 | -.402 | .287 | -.268 | -.657 | -.364 | -.238 | -.033 |
| 3. NA | -.131 | -.127 | - | .279 | .303 | .215 | .006 | .227 | .107 | .164 |
| 4. Preoccupation | -.225 | -.221 | .231 | - | .190 | .242 | .190 | .426 | -.018 | .144 |
| 5. Tolerance | -.075 | -.398 | .009 | .359 | - | .183 | .147 | .465 | .500 | .487 |
| 6. Withdrawal | -.283 | -.453 | .206 | .401 | .172 | - | .239 | .257 | .060 | .192 |
| 7.Mood modification | .694 | .688 | -.185 | -.390 | -.158 | -.603 | - | -.425 | -.060 | -.117 |
| 8. Impaired control | -.002 | -.045 | .128 | .192 | .438 | .368 | .195 | - | .215 | .399 |
| 9. Conflict | -.178 | -.250 | .040 | .156 | .458 | .107 | .117 | .059 | - | .603 |
| 10.Functional Impairment | -.205 | -.069 | .229 | .557 | .434 | .129 | .312 | .103 | .425 | - |

Note: Values below diagonal are from Indians; Values above diagonal are from Sabahans and Sarawakians

Full Sample

Table 4: Results of the Predictor role of internet addiction variables on subjective well-being constructs

| Model | | Ethnic Groups | | | | |
|-----------------------|------------|---------------------|--------------|----------------|---------------|-------------------------------|
| | | Total sample (1) | Malay (2) | Chinese (3) | Indian (4) | Sabahan/ Sarawakian (5) |
| Life satisfaction | | | | | | |
| Preoccupation | Life sat | -.080 | -.073bd | -.378**a | -.037d | -.420***ac |
| Tolerance | Life sat | -.021 | -.068d | -.055 | -.032 | -.151a |
| Withdrawal | Life sat | -.011 | -.072 | -.118 | -.209 | -.070 |
| Mood modification | Life sat | .599*** | .591***b | .409c | .836***b | .748***b |
| Impaired control | Life sat | -.070* | .074 | -.239*d | -.077 | -.092b |
| Conflict | Life sat | -.113* | .138 | -.064d | -.155d | -.364***abc |
| Functional Impairment | Life sat | -.030 | .037 | -.125 | -.092 | -.025 |
| Positive affect | | | | | | |
| Preoccupation | Pos affect | -.111* | -.079d | -.166 | -.034 | -.277*a |
| Tolerance | Pos affect | -.135* | -.123 | -.126 | -.408* | -.198 |
| Withdrawal | Pos affect | -.091* | -.087 | -.272** | -.010 | -.088b |
| Mood modification | Pos affect | .633*** | .640*** | .567*** | .933*** | .624*** |
| Impaired control | Pos affect | -.005 | -.005 | -.034 | -.197 | -.056 |
| Conflict | Pos affect | -.769 | -.050d | -.026 | -.026d | -.331*abc |
| Functional Impairment | Pos affect | -.097* | -.105b | -.094ac | -.276 | -.371**ab |
| Negative affect | | | | | | |
| Preoccupation | Neg affect | .038 | .057b | .332*a | .143 | .203 |
| Tolerance | Neg affect | .158* | .251** | .017 | .202 | .202 |
| Withdrawal | Neg affect | .081 | .148 | .074 | .134 | .047 |
| Mood modification | Neg affect | -.153** | -.151* | -.167*** | -.009 | -.080 |
| Impaired control | Neg affect | .094 | .027 | .117 | .095 | .055 |
| Conflict | Neg affect | .098 | .184* | -.093 | .073 | .036 |
| Functional Impairment | Neg affect | .097 | .011 | .227 | .203 | .012 |
| R2 for SWLS | | .498 | .439 | .474 | .439 | .808 |
| R2 for Neg affect | | .158 | .180 | .270 | .180 | .136 |
| R2 for Pos affect | | .497 | .502 | .707 | .502 | .649 |

Note: a Significantly different from the Malay sample; b significantly different from the Chinese sample; c significantly different from the Malay sample; d significantly different from the Sabahan/ Sarawakian sample.

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

Multisample Analyses

In the second stage of the analysis, we performed a series multisampling structural equation modelling to detect any variation in the structure of the measurement model, and structural associations amongst the constructs across the four ethnic groups. Byrne (2016) recommended the invariance routine generally consists of actor loadings (factor coefficients), separating the variance in factor analysis, and factor correlations, followed by the structural parameters which demonstrate the association amongst the constructs. Measurement parameters through the invariance routine were firstly constrained as equal across the

samples. Model fit indices for five models in the invariance routine and comparisons between these five models are depicted in Table 5. In all ethnic groups CFI, RMSEA, X^2/df indicated a good fit of the data for the model (Table 5). Though the X^2 was statistically important across most of the sub-samples, all indicators were within the suggested ranges. Therefore, the fit indices indicated reasonable fits for the models. By assessing the differences between unconstrained and constrained models, the differences across all models were significant. In Table 5, the baseline model (model 1) first was assessed to check if the configuration of the items and factors was reasonable across the samples. Model 1 confirmed a good fit of the data. The Chi2/df showed that models 2, 3, and 4 significantly fit the data and then can be expected to match the interrelations (factor covariance and paths), the measurement, the factor variances, and covariance are invariant. Lastly, model 5 was assessed and showed a decrement in good fit indices from the baseline model, but slight change comparatively to the two earlier models in the invariance routine (see Table 5). There were a few structural paths, which differed significantly across the samples.

The results established that the standardized parameter estimates for the mood modification and PA paths were significant across all samples, while the effects of the mood modification for SWLS was significant in all, but the Chinese sample. Besides, the effect of mood modification on NA was significant in the Chinese and Malaysian samples. Sabahan and Sarawakian individuals presented a much higher association of preoccupation, and SWLS, than the Chinese. In the Indian sample, the three relationships were well supported and significant. The association between tolerance and PA was significant in the Indian sample. The multiple analyses also accounted for large amounts of the predictive variance in SWLS, PA, and NA amongst the ethnic groups (for SWLS, $R^2=.439$ in Malay, $.474$ in Chinese, $.439$ in Indian, and $.808$ in Sabahan and Sarawakian; for positive affect, $R^2=.502$ in Malay, $.707$ in Chinese, $.502$ in Indian, and $.649$ in Sabahan and Sarawakian; for NA, $R^2=.180$ in Malay, $.270$ in Chinese, $.180$ in Indian, and $.134$ in Sabahan and Sarawakian).

Table 5: Invariance analyses across the ethnic groups in the research model

| Model | n | X^2 | df | X^2/df | CFI | RMSEA | ΔX^2 | Δdf | P<.01 | ΔCFI |
|------------------------|-----|---------|-----|----------|------|-------|--------------|-------------|-------|--------------|
| Ethnicity | | | | | | | | | | |
| Malay | 222 | 259.423 | 117 | 2.217 | .901 | .064 | | | .000 | |
| Chinese | 99 | 131.290 | 117 | 1.122 | .979 | .036 | | | .000 | |
| Indian | 28 | 187.825 | 117 | 1.605 | .962 | .050 | | | .000 | |
| Sabahan/ Sarawakian | 56 | 242.682 | 117 | 2.074 | .901 | .040 | | | .000 | |
| Model 1 Baseline | | 5070 | 306 | 1.578 | .917 | .038 | | | | |
| Model 2 | | 737.390 | 471 | 1.566 | .914 | .049 | 230.19 | 165 | Yes | -0.003 |
| Model 3 | | 757.783 | 504 | 1.714 | .905 | .044 | 250.583 | 198 | Yes | -0.009 |
| Model 4 | | 800.683 | 550 | 2.167 | .901 | .043 | 293.483 | 244 | Yes | -.004 |
| Model 5 | | 881.376 | 619 | 2.698 | .899 | .060 | 371.176 | 313 | Yes | -0.002 |

Note: Model 1 – unrestricted model, Model 2 – measurement equivalent model; Model 3: model 2 constraints plus equal factor variance and covariances; Model 4: model 3 constraints plus equal paths; Model 5: model 4 constraints plus equal factor residuals (“fully constrained”). The models of four and five refer to the latent construct.

DISCUSSION AND IMPLICATIONS

This study sought to examine existing literature by focusing on non-western countries like Malaysia, by incorporating SWLS, NA, and PA of SWB. This was achieved by using a multidimensional approach for measuring IA. Another novel aim of this study was to investigate the relationship between IA and SWB across different ethnic groups. This study also evaluated how various characteristic symptoms of IA relate to the SWB dimensions simultaneously. By examining the IA predictors in one model, we were capable of assessing the unique role of each predictor. In line with previous studies, we discovered that the three facets of SWB were differentially related to the symptoms of IA.

Past researchers found that mood modification through internet use is often linked with increased NA (Brand et al., 2016; Elhai, Levine, Dvorak, & Hall, 2016; Hormes, Kearns, & Timko, 2014). We also realized that mood modification was linked with increased PA and SWLS. According to Young (2004), one possible explanation of this result is that interactive internet application allows the formation of an online stimulation that may modify users' moods which includes reduced loneliness and depression, increased self-esteem, happiness, and well-being. According to Caplan (2010), mood regulation is realized as the use of the Internet to decrease feelings of loneliness, or emotional distress. In short, internet users seek to address their negative mood or to escape from the realities of life, which leads to the Internet-related addiction (Gmel et al., 2019; Vas & Gombor, 2009). One of the implications of these findings is what clinicians consider as a self-regulatory model for effective management of mood modification. This model can help internet users by providing a much more suitable long-term strategy for dealing with negative effects (e.g. depression and anxiety), and balancing the habitual control of behavior when they use the internet frequently.

Besides, the results showed that tolerance was a predictor of both decreased PA and increased NA, which is in line with that of previous studies (Charlton & Danforth, 2007; Starcevic & Aboujaoude, 2017). Tolerance is believed to be central in maintaining internet dependence and is a frequently measured pre-eminent \ indicator of higher risks for later dependence in minors or early cases (Rounsaville et al., 1986). From the results obtained, promoting the healthy use of the internet represents a thoughtful step toward successfully preventing and avoiding this potentially debilitating symptom. The Hong Kong Family Welfare Society (2018) established a zero-tolerance approach to cope with cyberbullying and promote the healthy use of the internet culture in schools. HKFWS also developed a website that served as a Healthy Internet for Family platform to encourage efficient learning via the internet, as well as promote children and adolescents toward improving safe and healthy habits, and encourage family harmony.

Furthermore, results showed that impaired control negatively predicted SWLS. Impaired control deals with scenarios where addicts realize that they may have been behaving excessively in terms of internet addiction, and want to reduce or prevent it, but realize they do not have effective control over their behavior. Our results are also consistent with previous research works, which realized that IA can lead to loss of control, and reduced levels of well-being or SWLS (Meerkerk et al., 2010; Muusses et al., 2014). Clinical implications can be derived from these findings, of which self-control has been suggested to be the main factor related to IA (Dong & Potenza, 2014). Like most activities, moderation and controlled internet use are crucial, and the best part of preparing people for modern life, thus, assisting them in

developing self-control and self-management when using the internet is a large step toward driving improvement.

The results also showed negative relationships between conflict, functional impairment, and PA. Based on the results, most users claimed to have an uncertain relationship between their internet use, and their capabilities to focus on tasks. The internal conflict between the user's capability to be helpful, and productive or spending too much time on the internet, has some influence on how users perform their daily responsibilities.

According to the distraction-conflict theory (Baron, 1986), these results confirm that some internet users faced various distracting secondary tasks during internet use, which disrupted their capability to cognitively process the information needed to fulfil a major task. In return, the distractions led to conflicts during which the users decided how best to reply. This decision has been related to raising stress levels (Baron, 1986). Under the lens of the theory, we place IA as a possible stress element induced by distractions. The results also showed a negative relationship between functional impairment and PA. Functional impairment or distress across several life domains refers to having really lost, or nearly lost social relationships, educational and vocational opportunities, due to IA. These results are in line with previous studies, which pointed out functional impairment is intended to indicate imperative of issues affecting social interactions, and academic performance or work (Chen et al., 2015; Milani, Osualdella, & Di Blasio, 2009).

Based on these findings, clinicians can provide reality therapy-based group counselling which enables Internet-addicted clients to recognize that they may have allowed themselves select to get hooked on internet use in an unhealthy way and that they are responsible for mental disorders or psychiatric disorders that arise through internet use which is a consequence of spending hours online. The result of a previous study displayed the reality of therapy based group counselling which showed a decrease in the levels of internet dependency amongst students and increased their actual SWLS levels (Ođacı & Çelik, 2017). Moreover, two further characteristic symptoms of IA, such as preoccupation with the Internet, and withdrawal, play negative roles in predicting PA in the current study. These findings have demonstrated the potential ill effects of IA concerning cognitive processes, such as being preoccupied with thoughts. Similarly, many studies concluded that preoccupation with internet use might cause several psychological and social issues or clinical problems (Alavi et al., 2011; Kuss et al., 2014). Our findings were related to withdrawal symptoms from IA. It also appeared to contradict those of previous experimental studies which have, thus far, suggested that abstinence from social media use is likely to result in positive changes to the person's well-being (Kross et al., 2013; Tromholt, 2016) and conversely its continued use reduces SWB and promotes NA (Fardouly et al., 2018; Verduyn et al., 2015). In terms of treatment, rational Emotive Behavior Therapy (REBT; Ellis, 2004) which is a form of cognitive behaviour therapy for the symptoms of preoccupation with the internet and withdrawal are highly beneficial. However, many users suffering from IA do not seek help and don't recognize that they have a problem. The essence of REBT in treating internet dependencies is to facilitate abstinence and a return to happiness and health by decreasing irrational thoughts and beliefs, as well as emotions that lead to addictive behaviors.

Finally, the results showed significant differences across Malays, Chinese, Indians, and Sabahans and Sarawakians ethnicities in Malaysia in terms of the relationships between the constructs, magnitudes of both factor loadings, and the standardized coefficients from the

predictors to SWB. These results suggest that IA has a different influence on SWB across ethnic groups in Malaysia, and these ethnic groups play a vital function in shaping Malaysian expectations about the potential difficulties they may face which is associated with IA. Our findings underline the importance of cross-cultural studies in the area of IA and SWB. It means that Malaysians from different cultural backgrounds are exposed to different environmental stressors, different cultural values and beliefs, and even different coping responses with regards to each symptom of IA. Luczak et al. (2017) assumed that addictive behaviors may vary across ethnic groups. Lindridge et al. (2015) also stated that different ethnic groups may have varied rationales for why they may use the internet, how they use the internet, and how they deal with negative fallouts of internet usage. This study is consistent with a previous study, which suggested that ethnicity may qualify relationships between smartphone use disorders, and SWB (Lachmann et al., 2018).

In particular, our findings call for the consideration that internet addiction may perpetuate preoccupation symptoms among Sabahan and Sarawakian people. Clinicians may use this information to screen these people for Internet addiction and to monitor for higher preoccupation symptoms that may be undetected by their parents and the community. Considering the opposite causal pathway, it may be that all samples except the Chinese sample with high mood modification symptoms are likely to use the internet as an outlet or a more comfortable area to feel good, suggesting that clinicians may be successful in using treatments that capitalize on their affinity to these media (Ceranoglu, 2010). The overall implication from these results is to shift ethnicity regarding internet use so that IA and its common mental health comorbidities are given suitable priority in the operational awareness of leaders, workplace policies, and mental health treatment in Malaysia. This paper also recommended that an ethnical education for all digital citizens should be emphasised in Malaysia. Education in digital ethnics should be a requirement, not an option. It should be an essential part of public education and university curricula.

LIMITATION AND FUTURE RESEARCH

This study is limited in several ways. Firstly, this study is based on a correlational, cross-sectional study. Hence, this empirical research is not adequate to realize how individuals experience difficulties reporting their perceptions of IA. Therefore, an in-depth interview and lab-scale study are needed to validate these findings. Secondly, the study is limited to examining Sabahans and Sarawakians separately as heterogeneous ethnic groups that permitted fine-grained examination of ethnic subgroups. Future studies should examine all ethnic groups separately with regards to the relationships between IA and SWB in Malaysia. Third, and most importantly, as a cross-sectional study, our results only indicated the causal relationships between seven symptoms of IA and individuals' of SWB. Further studies should include additional symptoms of IA to increase the confidence in the applicability of IA on SWB. Finally, clinical samples need to be included in future research works to ensure the specificity of the association between IA and SWB.

In conclusion, the findings of this research showed a significant relationship between different symptoms of internet addiction disorders, and areas of life satisfaction, as well as positive or negative effects across ethnic groups in Malaysia. The results strongly maintain the assumption that internet addiction disorder is not homogenous. Further studies investigating internet addiction disorder and its consequence on subjective well-being should

thus be cautious to consider several underlying internet issues with regards to problematic internet use, as well as particular symptoms, characteristics, and predictors.

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REFERENCES

- Akın, A. (2012). The relationships between Internet addiction, subjective vitality, and subjective happiness. *Cyberpsychology, Behavior, and Social Networking*, 15(8), 404–410. <https://doi.org/10.1089/cyber.2011.0609>
- Alavi, S. S., Maracy, M. R., Jannatifard, F., & Eslami, M. (2011). The effect of psychiatric symptoms on the internet addiction disorder in Isfahan's University students. *Journal of Research in Medical Sciences*, 16(6), 793–800.
- Ang, R. P., Chong, W. H., Chye, S., & Huan, V. S. (2012). Loneliness and generalized problematic Internet use: Parents' perceived knowledge of adolescents' online activities as a moderator. *Computers in Human Behavior*, 28(4), 1342–1347. <https://doi.org/10.1016/j.chb.2012.02.019>
- Baron, R. S. (1986). Distraction-conflict theory: Progress and problems. *Advances in Experimental Social Psychology*, 19, 1–40. [https://doi.org/10.1016/S0065-2601\(08\)60211-7](https://doi.org/10.1016/S0065-2601(08)60211-7)
- Brand, M., Young, K. S., Laier, C., Wöfling, K., & Potenza, M. N. (2016). Integrating psychological and neurobiological considerations regarding the development and maintenance of specific Internet-use disorders: An Interaction of Person-Affect-Cognition-Execution (I-PACE) model. *Neuroscience & Biobehavioral Reviews*, 71, 252–266.
- Byrne, B. M. (2016). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (3rd ed.). Routledge.
- Caplan, S. E. (2010). Theory and measurement of generalized problematic Internet use: A two-step approach. *Computers in Human Behavior*, 26(5), 1089–1097. <https://doi.org/10.1016/j.chb.2010.03.012>
- Ceranoglu, T. A. (2010). Video games in psychotherapy. *Review of General Psychology*, 14(2), 141–146.
- Charlton, J. P., & Danforth, I. D. (2007). Distinguishing addiction and high engagement in the context of online game playing. *Computers in Human Behavior*, 23(3), 1531–1548. <https://doi.org/10.1016/j.chb.2005.07.002>
- Chen, W., Li, D., Bao, Z., Yan, Y., & Zhou, Z. (2015). The impact of parent-child attachment on adolescent problematic Internet use: A moderated mediation model. *Acta Psychologica Sinica*, 47(5), 611–623. <https://doi.org/10.3724/SP.J.1041.2015.00611>
- Chun, J. (2016). Effects of psychological problems, emotional dysregulation, and self-esteem on problematic internet use among Korean adolescents. *Children and Youth Services Review*, 68, 187–192. <https://doi.org/10.1016/j.childyouth.2016.07.005>
- Department of Statistics Malaysia (DOSM). (2018). Current population estimates, Malaysia, 2017-2018. Retrieved from <https://www.dosm.gov.my/v1/index.php?r=column/pdfPrev&id=c1pqTnFjb29HSnNYNUpiTmNWZHArz09>
- DiNicola, M. D. (2004). Pathological Internet use among college students: The prevalence of pathological Internet use and its correlates (PhD Thesis, Ohio University, Ohio).
- Dong, G., & Potenza, M. N. (2014). A cognitive-behavioral model of Internet gaming disorder: Theoretical underpinnings and clinical implications. *Journal of Psychiatric Research*, 58, 7–11. <https://doi.org/10.1016/j.jpsychires.2014.07.005>

- Elhai, J. D., Levine, J. C., Dvorak, R. D., & Hall, B. J. (2016). Fear of missing out, need for touch, anxiety and depression are related to problematic smartphone use. *Computers in Human Behavior*, 63, 509–516. <https://doi.org/10.1016/j.chb.2016.05.079>
- Ellis, A. (2004). *Rational emotive behavior therapy: It works for me—It can work for you*. New York: Prometheus Books.
- Fardouly, J., Willburger, B. K., & Vartanian, L. R. (2018). Instagram use and young women's body image concerns and self-objectification: Testing mediational pathways. *New Media & Society*, 20(4), 1380–1395. <https://doi.org/10.1177/1461444817694499>
- Ferraro, G., Caci, B., D'amico, A., & Blasi, M. D. (2006). Internet addiction disorder: An Italian study. *CyberPsychology & Behavior*, 10(2), 170–175. <https://doi.org/10.1089/cpb.2006.9972>
- Gmel, G., Khazaal, Y., Studer, J., Baggio, S., & Marmet, S. (2019). Development of a short form of the compulsive internet use scale in Switzerland. *International Journal of Methods in Psychiatric Research*, 28(1), 3–11.
- Hanprathet, N., Manwong, M., Khumsri, J., Yingyeun, R., & Phanasathit, M. (2015). Facebook addiction and its relationship with mental health among Thai high school students. *Journal of the Medical Association of Thailand*, 98, 81–90.
- Hazita Azman, Ali Salman, Norizan Abdul Razak, Supyan Hussin, Mohd Safar Hasim, & Musa Abu Hassan. (2014). Determining digital maturity among ICT users in Malaysia. *Jurnal Komunikasi: Malaysian Journal of Communication*, 30(1), 22–34. <https://doi.org/10.17576/jkmjc-2014-3001-02>
- Hormes, J. M., Kearns, B., & Timko, C. A. (2014). Craving Facebook? Behavioral addiction to online social networking and its association with emotion regulation deficits. *Addiction*, 109(12), 2079–2088. <https://doi.org/10.1111/add.12713>
- Koç, P. (2017). Internet addiction and subjective well-being in university students. *Journal of Positive Psychology and Wellbeing*, 1(1), 34–41.
- Kross, E., Verduyn, P., Demiralp, E., Park, J., Lee, D. S., Lin, N., Shablack, H., Jonides, J., & Ybarra, O. (2013). Facebook use predicts declines in subjective well-being in young adults. *PloS One*, 8(8), 1–6. <https://doi.org/10.1371/journal.pone.0069841>
- Kuss, D. J., Griffiths, M. D., Karila, L., & Billieux, J. (2014). Internet addiction: A systematic review of epidemiological research for the last decade. *Current Pharmaceutical Design*, 20(25), 4026–4052.
- Lachmann, B., Sindermann, C., Sariyska, R. Y., Luo, R., Melchers, M. C., Becker, B., Cooper, A. J., & Montag, C. (2018). The role of empathy and life satisfaction in internet and smartphone use disorder. *Frontiers in Psychology*, 9, 1–11. <https://doi.org/10.3389/fpsyg.2018.00398>
- Leelakulthanit, O. (2013). Life satisfaction of the Internet and non-Internet users in Thailand. *The International Business & Economics Research Journal (Online)*, 12(4), 415–426. <https://doi.org/10.19030/iber.v12i4.7740>
- Leelanuithanit, O., Day, R., & Walters, R. (1991). Investigating the relationship between marketing and overall satisfaction with life in a developing country. *Journal of Macromarketing*, 11(1), 3–23. <https://doi.org/10.1177/027614679101100102>
- Lindridge, A., Henderson, G. R., & Ekpo, A. E. (2015). (Virtual) ethnicity, the Internet, and well-being. *Marketing Theory*, 15(2), 279–285. <https://doi.org/10.1177/1470593114553328>

- Lu, X., & Yeo, K. J. (2015). Psychometric properties of the Internet addiction test in a sample of Malaysian undergraduate students. *Psicología Educativa*, 21(1), 17–25. <https://doi.org/10.1016/j.pse.2015.03.001>
- Luczak, S. E., Khoddam, R., Yu, S., Wall, T. L., Schwartz, A., & Sussman, S. (2017). Prevalence and co-occurrence of addictions in US ethnic/racial groups: Implications for genetic research. *The American Journal on Addictions*, 26(5), 424–436. <https://doi.org/10.1111/ajad.12464>
- Mak, K.-K., Lai, C.-M., Watanabe, H., Kim, D.-I., Bahar, N., Ramos, M., Young, K. S., Ho, R. C., Aum, N.-R., & Cheng, C. (2014). Epidemiology of internet behaviors and addiction among adolescents in six Asian countries. *Cyberpsychology, Behavior, and Social Networking*, 17(11), 720–728. <https://doi.org/10.1089/cyber.2014.0139>
- Mahyuddin Daud, & Juriah Abd Jalil. (2017). Protecting children against exposure to content risks online in Malaysia: Lessons from Australia. *Jurnal Komunikasi: Malaysian Journal of Communication*, 33(1), 115–126. <https://doi.org/10.17576/JKMJC-2017-3301-08>
- Malaysian Communications and Multimedia Commission (MCMC). (2017). Internet user survey 2017. Retrieved from <https://www.mcmc.gov.my/skmmgovmy/media/General/pdf/MCMC-Internet-Users-Survey-2017.pdf>
- Meerkerk, G.-J., van den Eijnden, R. J., Franken, I. H. A., & Garretsen, H. F. L. (2010). Is compulsive internet use related to sensitivity to reward and punishment, and impulsivity? *Computers in Human Behavior*, 26(4), 729–735. <https://doi.org/10.1016/j.chb.2010.01.009>
- Milani, L., Osualdella, D., & Di Blasio, P. (2009). Quality of interpersonal relationships and problematic Internet use in adolescence. *CyberPsychology & Behavior*, 12(6), 681–684. <https://doi.org/10.1089/cpb.2009.0071>
- Mooij, M. D. (2018). *Global marketing and advertising: Understanding cultural paradoxes* (5th ed.). Thousand Oaks: Sage.
- Muusses, L. D., Finkenauer, C., Kerkhof, P., & Billedo, C. J. (2014). A longitudinal study of the association between compulsive internet use and wellbeing. *Computers in Human Behavior*, 36, 21–28. <https://doi.org/10.1016/j.chb.2014.03.035>
- Norsiah Abdul Hamid, Mohd Sobhi Ishak, & Norhafezah Yusof. (2016). Assessing validity and reliability of social media as an empowerment tool for a group at risk in Malaysia. *Jurnal Komunikasi: Malaysian Journal of Communication*, 32(1), 193–207. <https://doi.org/10.17576/jkmjc-2016-3201-09>
- Odacı, H., & Çelik, Ç. B. (2017). Internet dependence in an undergraduate population: The roles of coping with stress, self-efficacy beliefs, and sex role orientation. *Journal of Educational Computing Research*, 55(3), 395–409. <https://doi.org/10.1177/0735633116668644>
- Rohaya Mohd Nor, Teddy Edwin Chapun, & Constance Rinen Justin Wah. (2013). Malaysian rural community as consumer of health information and their use of ICT. *Jurnal Komunikasi: Malaysian Journal of Communication*, 29(1), 1–27.
- Rounsaville, B. J., Spitzer, R. L., & Williams, J. B. (1986). Proposed changes in DSM-III substance use disorders: Description and rationale. *The American Journal of Psychiatry*, 143, 463–468.

- Senol-Durak, E., & Durak, M. (2011). The mediator roles of life satisfaction and self-esteem between the affective components of psychological well-being and the cognitive symptoms of problematic Internet use. *Social Indicators Research*, 103(1), 23–32. <https://doi.org/10.1007/s11205-010-9694-4>
- Sirkeci, I. (2009). Ethnic Marketing Potential in England and Wales. *Asian Journal of Marketing*, 2(1), 1–9. <https://doi.org/10.3923/ajm.2009.1.9>
- Soh, P. C., Chew, K. W., Veeri, C. A., & Ang, P. H. (2011). Ethnic-based digital divide and internet use amongst Malaysian students. *Akademika*, 81(1), 93–100.
- Starcevic, V., & Aboujaoude, E. (2017). Internet addiction: Reappraisal of an increasingly inadequate concept. *CNS Spectrums*, 22(1), 7–13. <https://doi.org/10.1017/S1092852915000863>
- Syarizan Dalib, Minah Harun, Norhafezah Yusof, & Mohd Khairie Ahmad. (2019). Exploring intercultural competence among students in Malaysian campuses. *Jurnal Komunikasi: Malaysian Journal of Communication*, 35(1), 1–16. <https://doi.org/10.17576/jkmjc-2019-3501-01>
- Telef, B. B. (2015). The positive and negative experience scale adaptation for Turkish university students. *European Scientific Journal*, 11(14), 49–54.
- The Hong Kong Family Welfare Society. (2018). Healthy use of the Internet “A better Internet starts with you” campaign. HKFWS. <https://www.hkfw.org.hk/en/home>
- Tromholt, M. (2016). The Facebook experiment: Quitting Facebook leads to higher levels of well-being. *Cyberpsychology, Behavior, and Social Networking*, 19(11), 661–666. <https://doi.org/10.1089/cyber.2016.0259>
- Turnbull, N., Peltzer, K., Pengpid, S., Low, W. Y., Huu, T. N., Rochmawati, E., & Win, H. H. (2018). Pathological Internet use and psychosocial risk factors among ASEAN university students. *Iranian Journal of Psychiatry and Behavioral Sciences*, 12(1), 1–8. <https://doi.org/10.5812/ijpbs.10063>
- Vas, L., & Gombor, A. (2009). Exploring Internet motives and life satisfaction among Hungarian and Israeli medical students, living in Hungary. *Journal of Happiness Studies*, 10(6), 685–701. <https://doi.org/10.1007/s10902-008-9114-5>
- Verduyn, P., Lee, D. S., Park, J., Shablack, H., Orvell, A., Bayer, J., Ybarra, O., Jonides, J., & Kross, E. (2015). Passive Facebook usage undermines affective well-being: Experimental and longitudinal evidence. *Journal of Experimental Psychology: General*, 144(2), 480–488.
- Watson, D., Clark, L. A., & Tellegen, A. (1988). Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*, 54(6), 1063–1070. <https://doi.org/10.1037/0022-3514.54.6.1063>
- Widyanto, L., & Griffiths, M. (2007). Internet addiction: Does it really exist?(revisited). In J. Gackenbach (Ed.), *Psychology and the internet* (2nd ed., pp. 141–163). Amsterdam: Elsevier.
- Wong, X. Y., Gan, S. Y., & Chong, H. J. (2016). The relationship between loneliness, life satisfaction and internet addiction among young adults (Bachelor Thesis, UTAR, Malaysia).
- Yoo, Y.-S., Cho, O.-H., & Cha, K.-S. (2014). Associations between overuse of the internet and mental health in adolescents. *Nursing & Health Sciences*, 16(2), 193–200.
- Young, K. S. (2004). Internet addiction: A new clinical phenomenon and its consequences. *American Behavioral Scientist*, 48(4), 402–415.