# Depression, Anxiety, Stress, and Satisfaction with Life: Moderating Role of Interpersonal Needs among Undergraduate Students

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# Abstract

Background

Depression, anxiety, and stress are ranked among the top mental health concerns faced by undergraduate students. The transition to higher education coincides with the new social environment and adaptation that has potential to increase mental illness.

Aims

In this cross-sectional study, the Depression, Anxiety and Stress Scale, Satisfaction with Life Scale and Interpersonal Needs Questionnaire were used to examine depression, anxiety, stress, interpersonal needs, and satisfaction with life among 430 undergraduate students in two private universities in Malaysia.

Method

This study conducted hierarchical regression analysis to show that thwarted belongingness accentuates the negative relationship between stress and satisfaction with life.

Results

The study also showed that students, who reported higher perceived burdensomeness, appeared to be less than satisfied in life, but there is a positive relationship between (i) depression and (ii) anxiety with satisfaction with life.

Conclusions

Findings and suggestions for mental health practitioners, researchers and teaching staff, are put forward.


# Background

The World Health Organization[1] indicated that mental conditions among young adults is one of the global burdens of concern with depression being the third leading cause of the condition and suicide being the second leading cause of death among 15-29-year olds. Most mental health disorders have their highest onset during young adulthood[2]. Various research findings suggested that 40 million of the adults in the United States have anxiety disorder where 75% of them experienced their first episode by age 22, a typical college age[3], over half of the college students in the United States had at least one mental health problem[4] and more than 20% of the Hong Kong university students also suffered from either depression, anxiety or stress[5].

Inferring from the above, majority of the young people in this category are in college or university. Hence, the research of undergraduate students' mental health was a significant and crucial area to investigate. Depression, anxiety, and stress are the common issues that affect the well-being of students[(6,7)]. The number of university students with mental illness has risen remarkably over the past few years[8], specifically the number of people having depression has doubled and suicidal symptoms among students has tripled over the same period. In Malaysia, the NHMS[9] found that 29.2% of the adult population have suffered some form of mental illness compared to 10.7% in 1996 suggesting that prevalence rate has doubled over that period. The number of adults who suffered from emotional issues has increased to about 30% in 2015. Among the groups of adults, 15.7% were students who suffered from depression, anxiety and stress in Malaysia[9]. The statistics also indicated that the rate of increase tripled in 20 years. The statistics reflected the higher education students as they are often viewed as elite or a privileged group, but they are not exempted from suffering with disability related to mental illness[10].

The Malaysian Mental Healthcare Performance technical report[11] revealed that the prevalence of mental health problems among individuals above 16 years old is slightly higher for female (30.8%) as compared to males (27.6%). Furthermore, similar finding has also been proposed[12] in their study where they demonstrated that in Malaysia, depression (17.7%), anxiety

(39.5%), and stress (10.1%) were among the top three mental health issues reported by 25, 507 students. Adding on, according to Keyes et al.[13] common form of mental illness prevalent among college students are depression and anxiety. Hence, their finding is consistent with the statistics from Malaysian Mental Health Performance report[11] which indicates that students who screen positive results for a mental illness are at high risk of developing suicidal behaviour. Although this research does not directly explain the context with relation to suicidal ideation research, suicide is considered as a consequence of depression, anxiety and stress.

When looking at western countries for instance, the United States, the most prevalent mental illness among college students is also anxiety disorders with estimated 12% of students suffering from it. Another typical mental health problem is depression with estimated 7–9% in college students. A study on the mental health of 190 students in Malaysia indicated that 11.10% of students reported severe level of depression, 10.00% for severe level of anxiety, and 9.5% for severe level of stress[14]. In addition, research has also shown that depression, anxiety and stress often time lead to suicide[12]. Although suicide is not a disability, among Malaysian youth – 7% of them reported having suicidal ideation and the majority of them turned it into action[15]. Consistent with this finding a past paper has suggested that mental illness in the form of depression and anxiety is prevalent among college students[7]. Furthermore, students who were screened positive for mental illnesses are at higher risk of suicidal behaviour and poor academic performance[13].

Moving on, mental well-being includes psychological attributes such as students' interest in their course of study, their coping mechanisms with respect to academic issues, and their attitudes towards cultivating the development of personal core competencies, engagement with outsiders by connecting with people and professional self-perceptions[16]. These characteristics have effects on the educational productivity as a whole[17]. The educational productivity theory postulates that when a person is having psychological issues such as depression, anxiety, and stress, their educational results will be affected in a negative way. Higher level of stress also reported poorer social skills where individual's ability to seek for social support and engage socially were greatly impaired[18]. If an individual fail to satisfy this need for belonging, it led way to negative outcomes such as dissatisfaction with life or poor performance. Since unfulfilled needs will lead to dissatisfaction of interpersonal needs, it causes one unable to hit the target, therefore further increase the level of mental issues which can affect the academic performance indirectly[19]. Many researches have been conducted that explores relationship of various psychological variables such as depression, stress, anxiety, and satisfaction with life (SWL)[20–25]. However, there is a very limited study conducted to examine the role of interpersonal needs such as thwarted belongingness and perceived burdensomeness as the moderating factors in the relationship among depression, stress, anxiety, and SWL of undergraduate students.

# The Current Study

Based on the above-cited approach and research findings, this study aims to discover whether interpersonal needs act as a moderating factor and has an impact on SWL of undergraduate students in Malaysia. This study intends to find out the relationship between depression, anxiety, and stress on SWL of undergraduate students in two private universities in Malaysia with the effect of interpersonal needs as a moderator. The perceived burdensomeness and thwarted belonging act as the constructs of interpersonal needs.

# Depression, Anxiety, Stress, And Swl

Students are generally adolescents who are susceptible to positive and negative affective conditions that determine their state of happiness or well-being. Their wellness motivated the current study to focus on the effects of negative affective conditions, specifically depression, anxiety, and stress on SWL. To ensure the students' mental health wellness, universities need to monitor their student's mental health continuously and systematically. It is normal that Institutions regularly conduct surveys

on the well-being of their students. Such monitoring methods would permit the universities to assess the mental wellbeing of the of students and the survey results can assist them in improving the viability of their existing counselling programs[26].

One past study indicated that severe levels of depression, anxiety and stress are highly associated with low life satisfaction among university students[27]. These negative affective conditions, ranging from depression to stress, are not healthy emotional symptoms and may affect the subjective well-being of individuals. Although well-being composed of affective and cognitive components[28], this study takes an interest on the latter component on the grounds that individuals who are empowered and exposed to social media makes conscious cognitive judgements of their life based on self-defined criteria of 'a good life'. Similarly, Boyraz, Waits and Felix[29] found significant association between authenticity and life satisfaction and decreased distress. Their findings re-emphasized the importance of helping clients to minimize the incongruence between their true self and experiences in fostering their adjustment and well-being. These aforementioned literatures explain how lower life satisfaction is a product of inability by individuals to have congruency between ideal self and real self.

On the other hand, greater attachment anxiety is associated with greater depressive symptoms, whereas attachment avoidance was unrelated to depressive symptoms[30]. Attachment anxiety is usually associated with greater self-criticism, hypervigilance of cues of disapproval from people in their surroundings, and feelings of unworthiness of love. These cognitions may lead to excessive negative affect and depressive symptoms. Thus, based on the reviews, this study hypothesized that:

$H_1$: Depression is negatively associated with SWL

$H_2$: Anxiety is negatively associated with SWL

$H_3$: Stress is negatively associated with SWL

# The role of interpersonal needs and SWL.

According to Maslow[31] who coined hierarchy of needs theory, individuals strive to fulfil the basic needs such as the physiological needs and safety needs before achieving the belongingness needs, esteem needs, and self-actualization needs. Undergraduate students fulfil their belongingness needs via the interpersonal interactions with the others. These students are in developmental stage of identity vs. role confusion and intimacy vs. isolation as suggested by Erikson[32]. They are at the age where self-identity is being developed and one of the key elements which contributed to the formation of self-identity is the feeling of belongingness. Feeling of belongingness comes from the interaction and recognition of the individuals around them. Failure to form such close social interactions with the surrounding triggers the feeling of thwarted belongingness. Thwarted belongingness is an interpersonal need that should be fulfilled, and undergraduate students need interpersonal attachment with their social circle to create sense of belonging in the respective social circle.

Thwarted belongingness is categorized as the social or belongingness needs, the third level needs among the five levels in the Maslow's hierarchy of needs[33]. For individuals to score in their academic performance, which is related to the esteem needs, they need to fulfil their social needs beforehand[34]. This explains that inability of an individual to achieve need for belongingness hinders them from achieving higher level of self. It further increases the chances of experiencing depression, anxiety, and stress which have a reverse effect on academic performance[35].

Øverup et al.[30] mentioned that self-criticism and feelings of unworthiness would contribute in developing symptoms of anxiety and depression. Indeed, in the main analyses, Øverup et al.[30] found that interpersonal needs such as perceived belongingness and perceived burdensomeness mediates the relationship between attachment anxiety and depressive symptoms. Interestingly and in contrast, perceived belongingness would serve as a moderator in the current study. Perceived belongingness occurs in relationships with others and it is inclusive of perceived burdensomeness and thwarted belongingness. These factors are found to have important associations with suicidal ideation among college students[36]

where stressful life events experienced during adolescence could be overwhelming and students who are able to adjust their assumptions about the world and their self-identity have less suicidal risk. The decreased suicidal risk is even when the perceptions of lack of belongingness and burdensomeness co-exist. Thus, it is possible to make meaning of stressful life events, eventually free from depression and anxiety. The meaningful transformation would eventually and indirectly increase the students' SWL.

In the context of the current study, interpersonal needs refer to individuals' desires and divided into perceived burdensome and thwarted belongingness. There is scarce research which focuses on this area among undergraduate students compared to psychiatric patients[37,38]. According to Van Orden, Cukrowicz, Witte, and Joiner[39] both constructs of perceived burdensome and thwarted belongingness are pivotal and considered to be the most proximal interpersonal needs that lead to suicidal ideation. Other conditions such as mental disorders and stressful life events are comparatively more distant in the chain of risk but fortunately, perceived burdensomeness and thwarted belongingness are postulated as dynamic and obedient to therapeutic change.

Perceived burdensomeness is a mental state that a person has developed the perception that others would "be better if I were gone". Such a mental state is a result of an unmet social ability, a pre-condition that is supported by other frameworks such as self-determination theory which explains importance of human's innate need for connection and relatedness that allows them to grow and become competent in managing their life[40]. On the other hand, Van Orden et al.[39] pointed out that the perception of being a burden to others can be induced by multiple factors, including functional impairment[41–43], unemployment[44] and family discord[45]. These factors induce the perception of burdensomeness, which could lead to lower SWL and thoughts of attempt for suicide. Thus, we have hypothesized that:

$H_4$: Perceived burdensome moderates the relationship between depression, anxiety and stress on SWL.

$H_5$: Thwarted belongingness moderates the relationship between depression, anxiety and stress on SWL.

Our research framework is illustrated in Fig. 1.

INSERT FIGURE 1HERE

## Method

# Participants

Participant (*N* = 430) were recruited from private universities setting. Participating students were enrolled in the following programs: Pre-University (N = 15), Diploma (N = 11), Undergraduate Degree (*N* = 397), and Postgraduate Degree (N = 7). 73.3% percent of the respondents were between the age of 19 to 21 years. Female respondents accounted for 58.6% whereas male respondents accounted for 40.9% of the responses. Most of the respondents were local students (90.2%) and some were international students (9.7%). The respondents also reported on the following information with regards to family structure: (i) extended family, composed of grandparents, parents, children or relatives (38.4%), (ii) immediate family, composed of parents and children (53.5%), and (iii) single parent family, composed of father or mother and children (7.7%). Table 1 illustrates the demographic background of the respondents both in frequency and percentage.

Table 1
Demographic characteristics of the respondents

| Demographic Variables | Frequency | % |
|---|---|---|
| Age | 18 | 4.2 |
| 16 to 18 years | 315 | 73.3 |
| 19 to 21 years | 93 | 21.6 |
| 22 to 24 years | 4 | 0.9 |
| More than 25 years | | |
| Gender | 176 | 40.9 |
| Male | 252 | 58.6 |
| Female | 2 | 0.5 |
| Others | | |
| Nationality | 387 | 90.2 |
| Local student | 42 | 9.7 |
| Foreign student | | |
| Type of Family Structure | 165 | 38.4 |
| Blended family- includes grandparents, parents, children and relatives | 230 | 53.5 |
| Nucleus family- includes parents and children | 33 | 7.7 |
| Single parent family- includes either father or mother and sibling(s) | 2 | 0.5 |
| Others | | |
| Current Living Arrangements | 70 | 16.3 |
| Living alone | 76 | 17.7 |
| Living with friends | 245 | 57.0 |
| Living with parents | 24 | 5.6 |
| Living with extended family | 15 | 3.5 |
| Other | | |
| Pre-existing Mental Illness | 22 | 5.1 |
| Yes | 343 | 79.8 |
| No | 65 | 15.1 |
| Don’t know | | |
| Total Sleeping Hours | 3 | 0.7 |
| Less than 2 hours | 22 | 5.1 |
| 2 to 4 hours | 163 | 37.9 |
| 4 to 6 hours | 212 | 49.3 |
| 6 to 8 hours | 28 | 6.5 |
| More than 8 hours | | |

| Demographic Variables | Frequency | % |
|---|---|---|
| Single Source of Financial Support | 223 | 51.8 |
| Family | 21 | 4.9 |
| Scholarship | 8 | 1.9 |
| Part-time work | 2 | 0.4 |
| Own savings | 2 | 0.4 |
| Other | | |
| Overall Source of Financial Support | 394 | 91.6 |
| Family | 126 | 29.3 |
| Scholarship | 92 | 21.4 |
| Part-time work | 77 | 17.9 |
| Own savings | 15 | 3.5 |
| Other | | |
| Seek Help for Emotional Issue From | 196 | 45.6 |
| Family | 341 | 79.3 |
| Friends | 30 | 7.0 |
| Counsellor | 35 | 8.1 |
| Acquaintances | | |

INSERT Table 1 HERE

# Measures

**DASS-21 Questionnaire (DASS)**. DASS which is made up of three subscales namely depression, anxiety, and stress were used in this study. Each item in the questionnaire has three-point Likert scale ranging from 0 (did not apply to me at all) to 3 (applied to me very much, or most of the time) for respondents to select their answers[46]. The DASS (Depression, Anxiety, and Stress Scale) has been widely used and validated as a form of tool to assess the severity of depression, anxiety and stress among different samples[47]. Depression is defined as a state of mind where the person loses self-esteem and incentives, as if believing that he is incapable of achieving life-defining goals[48].This sense of hopelessness is attributed to absence of positive affect[49], thus rationalising the idea that adolescents who are depressed are less satisfied with life. Anxiety is characterised as physiological hyper arousal, where the individual experiences nervousness, fearfulness and autonomic arousal[(48,49)]. Stress is characterised as negative affect or emotional state of mind, where the individual experiences persistent arousal, tension, and tolerates low threshold for becoming upset and frustrated[48], The DASS scale assessed stress as difficulty in relaxing, nervous arousal, easily upset or agitated, irritable or over-active, and impatient. One past study indicated that severe level of depression, anxiety and stress are highly associated with low life satisfaction among university students[27]. DASS- 21 version is selected for this survey as it has reported good internal consistency and the factor analysis structure of the scale are stable enough to provide a desirable convergence to the study[(50–53)].

**Interpersonal Needs Questionnaire (INQ)** INQ is constructed to measure the sense of thwarted belongingness among participants. Nine items measured thwarted belongingness and six items measured perceived burdensomeness (see Appendix)[39]. Unlike DASS-21, interpersonal needs questionnaire measures responses by a design of five-point Likert scale

ranging from 1 (not at all true for me) to 5 (very true for me)[54]. The scale was used to measure the significance of interpersonal needs within an individual. Van Orden et al.[39] suggested that thwarted belongingness and perceived burdensomeness are closely related yet highly distinct aspects within areas of psychology. However, they explained that INQ underwent multiple group analysis among younger vs. older adults, clinical vs. non-clinical sample stating that it is applicable to diverse population. Previous studies mentioned that the scores derived from this scale provides a good validity and psychometric properties[39]. Hence, the items are reliable enough to assess sense of thwarted belongingness and perceived burdensomeness of an individual.

**Satisfaction with Life Scale (SWLS)**. SWLS was developed by Diener, Emmons, Larsen and Griffin[55]. It is a brief 5-item instrument designed to measure the concept of life satisfaction. The participants have to provide responses to the five items about their life satisfaction by indicating their score ranging from the highest number (7: strongly agree) to the lowest (1: disagree). According to Kobau, Sniezek, Zack, Lucas, and Burns[56], the SWLS demonstrated acceptable internal consistency reliability with Cronbach alpha value of ($\alpha = 0.88$).

# Data analysis

The data is analysed for descriptive and inferential statistics, which include reliability analysis, factor analysis, Pearson's product moment correlation, and hierarchical linear regression. The survey instrument used 3- and 5-point Likert-type response scale to treat the influence of common method bias. Additionally, this study also assessed the data with Harman's one-factor test to detect a general factor. The first factor did not account for more than 50% of variance and we proceeded with principal component analysis using Varimax rotation method to ensure that the items load on corresponding factors. The results of the factor analysis satisfied Kaiser-Meyer-Olkin Measure of Sample Adequacy (KMO-MSA) at a value above 0.5[57] and Bartlet's Test of Sphericity, which rejected the null hypothesis that the correlation matrix is an identity matrix.

## Results

Descriptive data are presented in Table 2. Data were normally distributed, and the skewness and kurtosis values were satisfactory. The reliability analyses assess the consistency of items in measuring the concept they set out to measure. Cronbach's alpha coefficient for all the variables were above 0.80. Although the mean value for anxiety for both genders is similar, male students appeared to report a slightly higher mean value for depression ($M = 1.94$, $S.D.= 0.69$) and stress ($M = 2.11$, $S.D.= 0.79$) whereas female students appeared to score higher for thwarted belongingness ($M = 2.78$, $S.D.= 0.83$). Similar to findings from our study, past research also states that male students were reported to have more severe depressive symptoms compared to female students[3]. The independent-samples t-tests showed that only satisfaction with life appeared to be significantly different statistically across gender, where male students reported a lower mean score compared to female students.

Table 2
Descriptive and reliability statistics of participants

| Score | Range | Mean (SD) | Mean (SD) | Cronbach's Alpha |
|---|---|---|---|---|
| | | Male | Female | |
| Depression | 0–3 | 1.94 (0.69) | 1.85 (0.62) | 0.890 |
| Anxiety | 0–3 | 1.82 (0.72) | 1.82 (0.65) | 0.895 |
| Stress | 0–3 | 2.11 (0.79) | 2.03 (0.74) | 0.924 |
| Perceived burdensomeness | 1–5 | 1.81 (0.97) | 1.68 (0.92) | 0.952 |
| Thwarted belongingness | 1–5 | 2.78 (0.83) | 2.92 (0.77) | 0.847 |
| Satisfaction with Life* | 1–7 | 3.78 (1.50) | 4.25 (1.41) | 0.938 |
| Note: * Significant difference between male and female students. | | | | |

INSERT Table 2 HERE

The bivariate correlation analyses examine the association between the variables understudy. Preliminary analysis was performed to ensure no violation of the assumption of normality, linearity and homoscedasticity. Table 3 showed that the strength of correlation between the independent variables, namely depression, anxiety, and stress, are strong and significant at $r \geq 0.60$. Moreover, the independent variables appeared to have stronger correlations with perceived burdensomeness than thwarted belongingness and reported weak and significantly negative correlations with SWL.

Table 3
Correlation between variables

| Variables | ALL | | | | | |
|---|---|---|---|---|---|---|
| | (1) | (2) | (3) | (4) | (5) | (6) |
| (1) Depression | 1 | | | | | |
| (2) Anxiety | 0.63** | 1 | | | | |
| (3) Stress | 0.63** | 0.67** | 1 | | | |
| (4) Perceived burdensomeness | 0.62** | 0.57** | 0.54** | 1 | | |
| (5) Thwarted belongingness | 0.15** | 0.23** | 0.24** | 0.17** | 1 | |
| (6) Satisfaction with Life | -0.28** | -0.15* | -0.15** | -0.23** | 0.19** | 1 |

INSERT Table 3 HERE

Based on the recommendations by Sharma, Durand, and Gur-Arie[58], the moderating effects of perceived burdensomeness and thwarted belongingness are tested using four-steps hierarchical regression analyses. Step 1 tests the effect of gender as control variable and it accounted for 2.3% in variance ($\beta = -0.15$, $p < 0.01$) in SWL. Step 2 tests the effects of depression, anxiety, and stress (Hypothesis 1 to 3), where depression accounted for 9.9% of variance whereas anxiety and stress are not significant predictors. Hypotheses 2 and 3 are not supported.

Step 3 examined the inclusion of moderator variables as independent variables and Table 4 presents the regression analyses for perceived burdensomeness (left column) and thwarted belongingness (right column). The F change value is not significant with the inclusion on perceived burdensomeness to the structural path, but F change is significant with the inclusion thwarted belongingness, which accounted for 4.7% of variance ($\beta = 0.23$, $p < 0.01$) in SWL. Step 4 tests Hypothesis 4 and 5 by including the product of independent variables and moderators. The interaction between depression with perceived burdensomeness (β

= 0.76, $p < 0.01$), and the interaction between anxiety with perceived burdensomeness (β = 0.79, $p < 0.01$) contributed 15.8% of variance, thus rendering partial support to Hypothesis 4 as pure moderator. For thwarted belongingness, only stress (β = 0.73, $p < 0.01$) appeared to be a significant predictor, contributing 17.3% of variance in SWL, thus rendering partial support to Hypothesis 5 as quasi moderator.

Table 4
Hierarchical Regression Analysis: Moderating Effect of Perceived Burdensome and Thwarted Belongingness

| **Perceptions** | **Outcome** | | | | **Perceptions** | **Outcome** | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **Satisfaction with Life** | | | | | **Satisfaction with Life** | | | |
| | ***Step 1*** | ***Step 2*** | ***Step 3*** | ***Step 4*** | | ***Step 1*** | ***Step 2*** | ***Step 3*** | ***Step 4*** |
| Control Variable | | | | | Control Variable | | | | |
| Gender | -0.15** | -0.13** | -0.13** | -0.12** | Gender | -0.15** | -0.13** | -0.11* | -0.12** |
| Independent Variable | | | | | Independent Variable | | | | |
| Depression | | -0.32** | -0.28** | -0.57** | Depression | | -0.32** | -0.31** | -0.55* |
| Anxiety | | 0.02 | 0.04 | -0.31* | Anxiety | | 0.02 | -0.01 | 0.12 |
| Stress | | 0.05 | 0.07 | 0.28* | Stress | | 0.05 | 0.01 | -0.54* |
| Perceived Burdensomeness | | | -0.10 | -0.86** | Thwarted Belongingness | | | 0.23** | -0.20 |
| Interaction Term | | | | | Interaction Term | | | | |
| Depression*Perceived Burdensomeness | | | | 0.76** | Depression*Thwarted Belongingness | | | | 0.34 |
| Anxiety*Perceived Burdensomeness | | | | 0.79** | Anxiety*Thwarted Belongingness | | | | -0.19 |
| Stress*Perceived Burdensomeness | | | | -0.43 | Stress*Thwarted Belongingness | | | | 0.73* |
| $R^2$ | 0.02 | 0.10 | 0.10 | 0.16 | $R^2$ | 0.02 | 0.10 | 0.15 | 0.17 |
| F Change | 10.01** | 11.82** | 2.47 | 8.88** | F Change | 10.01** | 11.82** | 23.21** | 4.65** |
| F | 10.01** | 11.56** | 9.77** | 9.78** | F | 10.01** | 11.56** | 14.38** | 10.96** |
| Durbin- Watson | 1.92 | | | | Durbin-Watson | 1.90 | | | |
| Significant levels: ** $p < 0.01$, * $p < 0.05$, + $p < 0.10$ | | | | | | | | | |

INSERT Table 4 HERE

The post hoc graphs are developed for significant interaction terms to visualise the relationship between the depression, anxiety, and stress with SWL under the influence of perceived burdensomeness and thwarted belongingness. Figure 2 revealed that students who scored lower than the mean average for perceived burdensomeness would experience lesser SWL when they experience greater depression and anxiety. On the contrary, the alleged relationship appeared positive when perceived burdensomeness was rated higher than average. Next, Fig. 3 showed that higher stress would mean lower SWL and students who scored higher on thwarted belongingness appeared to be experiencing a stronger negative relationship between stress and SWL.

INSERT FIGURE 2 HERE

INSERT FIGURE 3 HERE

## Discussion

The results of linear regression analyses presented at Table 4 showed that only depression predicted satisfaction in life even though all three exogenous variables, namely depression, anxiety, and stress were negatively correlated with the endogenous variable. Hereafter, we focus our attention on evidence highlighted by this study, where interestingly, interpersonal needs (perceived burdensomeness and thwarted belongingness) are moderating conditions that potentially reduce or raise the satisfaction in life among adolescents.

With reference to Fig. 2, the slopes informed that individuals who scored low on perceived burdensomeness reported higher satisfaction in life compared to those who scored high on perceived burdensomeness. While Fig. 2(i) and Fig. 2(ii) showed that individuals who reported high perceived burdensomeness reported low satisfaction in life, one of the other implicit observation derivable from the figures is the statistically indifferent low level of satisfaction across individuals who had been grouped into low and high level of depression, and anxiety. Based on Step 3 and Step 4 of Table 4, perceived burdensomeness exhibited the characteristics of pure moderating effect, thus suggesting its pivotal role to an individuals' wellbeing, especially when they are feeling blue. At the point of writing, the present study is one of the limited studies which analysed the explanatory role of interpersonal theory. Chu, Rogers, Gai, and Joiner[59] lent support to its role by presenting evidence which showed that both perceived burdensomeness and thwarted belongingness were explaining suicidal ideation, a state of mind that is essentially opposite of satisfaction in life, effectively. Another takeaway could be that individuals should not invest in believing that they are a burden to other people and others should not nurture this belief about those individuals to maintain their good mental equilibrium. It is essential for each individual to realise importance of self-care and believe in oneself to achieve higher level of life satisfaction.

On the other hand, Fig. 3 is dedicated to the quasi moderating effect of thwarted belongingness on the relationship between stress and satisfaction in life, where individuals who scored high on thwarted belongingness recorded higher satisfaction under both low and high stress circumstances, as compared to those individuals who scored low on thwarted belongingness. One of the reasons for this finding may be that, due to their desire for independence, young individuals who aspire to avoid sense of attachment are more inclined to withdraw and isolate themselves from others, gradually reducing their social network and limiting their ability to seek social support when needed[60]. This withdrawal dictates an increased sense of freedom but over the course of time, the individuals' sense of belongingness dissipates gradually to predispose them to egocentric personality and feelings of loneliness. In addition, the generation of the virtual world with increasing interaction in online market that displaces valuable interaction within family and friends are also contributors to decreasing satisfaction in real life[61].

When the participants scored low in thwarted belongingness, Fig. 3 shows that the higher the stress; the lower the satisfaction in life. The direction of the relationship remained the same when thwarted belongingness is high. In fact, the satisfaction in life is reported higher among participants with high thwarted belongingness, when compared to those with low thwarted belongingness.

This study claims that the sense of belongingness does not necessarily contribute to satisfaction with life. Higher thwarted belongingness indicates low sense of belongingness, where one fails to form close social interaction with the surroundings. Surprisingly, individuals who scores high in thwarted belongingness were pretty much satisfied with life; regardless of stress level. In addition, these individuals have poorer ability to cope with stress compared to those who scored low in thwarted belongingness. This study clearly shows that in the current modern life, social interaction or number of friends do not guarantee satisfaction with life. It can be speculated that the competence of individuals to manage their lives may lead them to have life satisfaction regardless of the need for belongingness. However, our finding is in contrast with some previous

research. Civitci[62] found that undergraduate students participating more in extracurricular activities, have higher college belongingness and higher life satisfaction. Similarly, in contrast to our findings, the result from a study by Mellor, Stokes, Firth, Hayashi, and Cummins[63] that supports Baumeister and Leary's "belongingness hypothesis" which suggests that each individual seek to form long-term, meaningful and positive relationships and failure to achieve this contributes to social isolation, loneliness and suicidal thoughts. Thus, this paper concluded that individuals who seek for higher need for belongingness tend to feel lonelier. With the opposing view provided by our findings in comparison to past studies, it is essential to be cautious in drawing conclusions about the relationship of need for belongingness and life satisfaction.

# Limitations And Avenues For Future Study

Given the significant burden of the mental health issues such as depression, anxiety, and stress to the sense of belongingness of students, prevention and promotion of positive mental health is suggested. Prevention activities such as school bullying, students educational accomplishment, employment planning activities and educational transformation were the outcomes of the science of prevention[64]. Universities and colleges can offer more activities, as part of the science of prevention, that suit the younger generation on a path to reduce the chances of having negative emotions. As mental health is a foundation for the well-being and academic success of students, all institutions of higher education undoubtedly have to actively encourage this agenda[65] and execute activities that focus on advocating importance of mental wellbeing among the students.

In addition, another aspect that allows individuals to stay calm even in the face of complicated situations is the art of mindfulness. Mindful individuals are better able to overcome negative affective outcomes despite experiencing high levels of perceived burdensomeness and thwarted belongingness. Hence, a past study has suggested incorporating mindfulness training as part of clinical intervention[66]. This could be embedded into the class activities, e.g., movement-based courses (e.g., Taiji quan, Pilates and GYROKINESIS ®) which included 15-week class syllabus. The result showed that the score of mindfulness measured among college students creased throughout this period[67]. In addition, mindfulness-based interventions are possible to lessen critical self-evaluations, thus it may improve self-acceptance and mental well-being of the individual[68]. Thus, future studies may be conducted to investigate the effectiveness of mindfulness training that incorporates experimental vs. control group to have an accurate picture of the result.

The results on undergraduates seeking help for emotional support show that they gained assistance most from their friends (79.4%) and least from the counsellors (7.2%). Only a small proportion of depressed students ever use counselling services, hence this phenomenon needs to be investigated[69]. Social stigma may be one of the reasons why they avoid seeking professional help. A systematic review was done by Clement et al.[70] on the impact of mental health related stigma which showed that stigma has a small to moderate-sized negative effect on getting help. Many researchers indicated that students are unwilling to seek help from campus counselling support services because they are concerned about that stigmatization that they may have to face[(2,8)]. Furthermore, other findings show that most of the youngsters sought help from their friends instead of professionals. Friendships are of utmost importance for youngsters, hence developing a peer support group in the school counselling program could be one of the most effective ways to reduce suicide rates among the youth[71].

Early identification of college students with mental health issues and comprehensive assessments are critical in order to provide immediate and adequate services to avoid any undesirable outcome[2]. Hence, continued rigorous research on the causes and depression prevention programs should be carried out to reduce the incidence of undesirable mental health problems[72] .

## Conclusion

Overall, the aim of this paper was to determine the moderating effect of interpersonal needs and its impact towards SWL of undergraduate students in Malaysia. Furthermore, this study examined the relationship between depression, anxiety, and stress towards SWL of undergraduate students. We found strong correlations among depression, anxiety, stress, and

perceived burdensomeness. In contrast, there is negative correlations between the independent variables and SWL. On the other hand, 2.3% and 9.9% of variances in SWL is explained by gender and depression respectively. We found that anxiety and stress are not significant predictors of SWL. Finally, depression and anxiety are significant moderators of perceived burdensomeness and stress is a significant moderator of SWL, both rendered partial support. The interaction between depression with perceived burdensomeness ($\beta = 0.76$, $p < 0.01$), and the interaction between anxiety with perceived burdensomeness ($\beta = 0.79$, $p < 0.01$) contributed 15.8% of variance, thus rendering partial support to Hypothesis 4 as pure moderator.

An interesting finding of this research which is different from the literature review is that when the thwarted belongingness is lower, the satisfaction with life is lower too. Hence, it is in a positive association result in comparison with past papers. We must understand that the participants in this research are from “Generation Z” whose lives are greatly influenced by new technologies. Hence, their sense of belongingness and ways of communication (Facebook, twitter, Instagram) is very different from the older generations. It was common that generational variance did not get enough attention in clinical and teaching settings.

Thus, it is crucial that mental health practitioners and researchers as well as teaching staff be more aware of the effect of generational differences. Every generation has its own way or method of learning and keeping information, following which the ways how people live and interact among themselves are changing as well[73]. Their interpretation of satisfaction with life or perspective of life might be different from college students of earlier generations. This is one of the areas that researchers can explore more in future.

## Abbreviations

DASS:Depression, Anxiety, and Stress Scale; KMO-MSA:Kaiser-Meyer-Olkin Measure of Sample Adequacy; INQ:Interpersonal Needs Questionnaire; M:Mean; S.D.:Standard deviation; SWL:Satisfaction with Life Scale

## Declarations

# Competing interests:

All authors declare no conflict of interest.

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# Authors’ contributions:

KSK originated the design of the study, collected data, performed statistical analysis. KSK, Tan CC and OPB interpreted and drafted the manuscript. KSK, TCC and OPB critically revised the draft manuscript. All authors have read and approved the final manuscript

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# Availability of data and materials:

The generated dataset is available upon request to the corresponding author at the contact address in this article.

# Ethics Approval and Consent to Participate:

Written informed consent was obtained from participants who took part in the study and Sunway University Research Ethics Approval was obtained (SUREC 2018/044). This article does not contain any studies with animals.

# Consent for publication:

Not applicable.

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# Figures

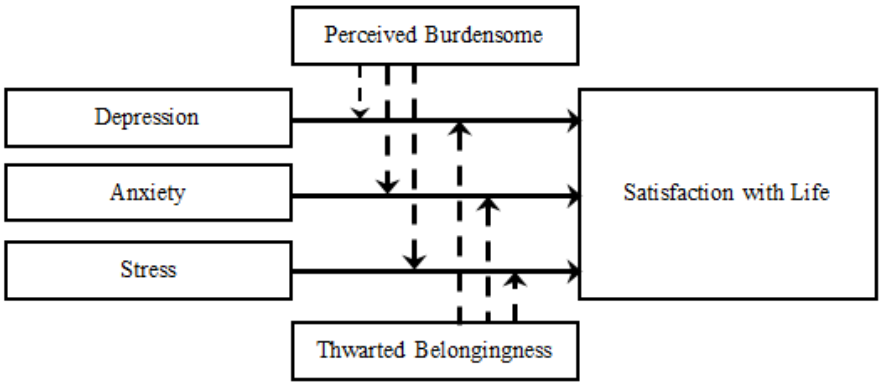


**Figure 1**

Research Framework

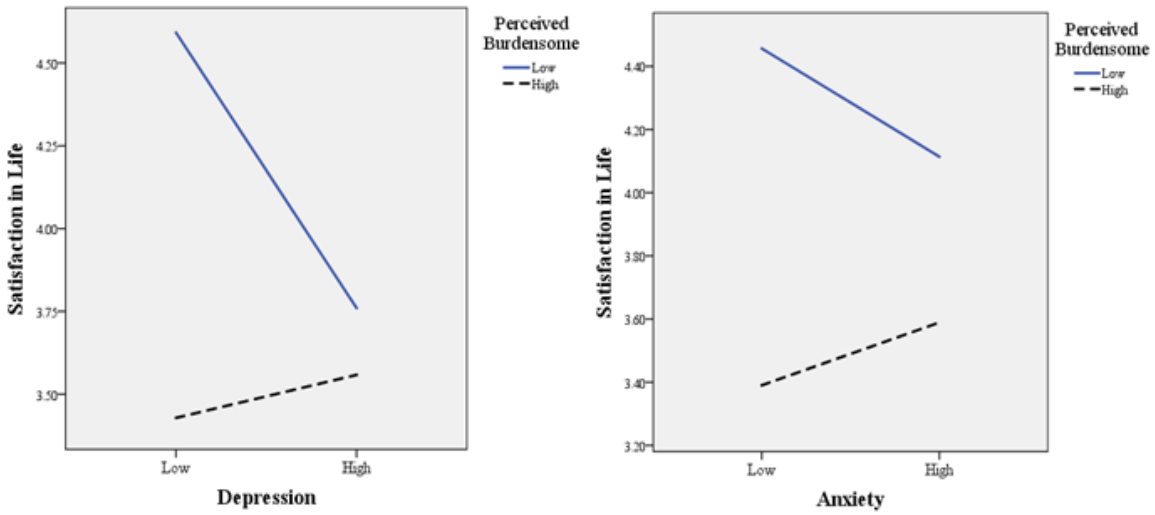


**Figure 2**

Plot of Significant Interactions: Moderating Effect of Perceived Burdensome on the Relationship between (i) Depression and (ii) Anxiety on Satisfaction with Life

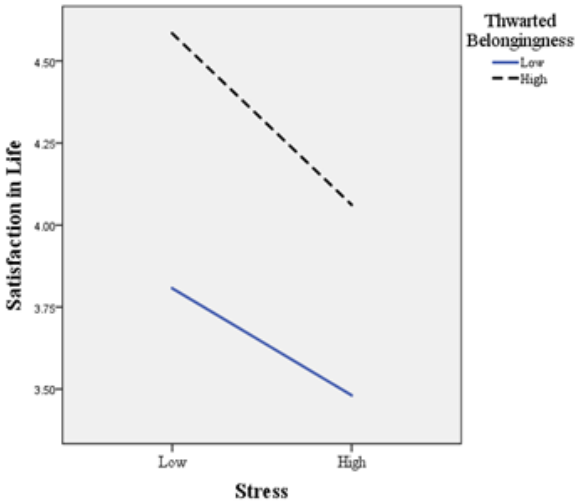

**Figure 3**

Plot of Significant Interactions: Moderating Effect of Perceived Burdensome on the Relationship between Stress on Satisfaction with life