ORIGINAL ARTICLE

Negative Automatic Thoughts as Predictor of Psychological Well-being among University Students in Malaysia

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ABSTRACT

Introduction: Negative automatic thoughts are spontaneous distorted or unhelpful thoughts that occur in response to a situation which influences a person's emotion, thoughts and physiological reaction. As university students juggle through the different responsibilities in life from managing academic expectations to being independent, it is common for them to experience negative automatic thoughts which can then impact their psychological well-being. This study aims to explore the mean score of negative automatic thoughts and determine its association with the psychological well-being of university students in Malaysia. **Methods:** This is a cross-sectional study among 156 university students between 18 to 24 years old (mean=19.02, SD=1.44) using Automatic Thought Questionnaire and Ryff Psychological Well-being scale. **Results:** University students were found to have higher tendency of negative automatic thoughts with the theme of overgeneralization (mean = 2.35) and personalization (mean = 2.25). None of the sociodemographic variables significantly predict psychological well-being but multiple regression analysis found a significant association between negative automatic thoughts and psychological well-being (β = -.723, p<.001). Having low negative automatic thoughts was found to predict higher positive relationship growth (β = -.711, p<.001) and autonomy (β = -.547, p<.001) which are important domains of psychological well-being. **Conclusion:** The study provides empirical support on the importance for university students to have the ability to manage their negative automatic thought as a significant predictor to their psychological well-being.
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INTRODUCTION

A university is a higher learning institution with an organized community of scholars and students that becomes a source of universal knowledge and highly skilled human power for various professions (1). It is also platform to meet new people and make new friends from the shared experience of living with other students and spending a significant amount of time together (2, 3). Furthermore, new skills and abilities can also be obtained at the university as preparation for the labour market (3). Therefore, individuals may attend university with the expectations of expanding their knowledge in addition to building new relationships and developing new skills that can prepare them for future employment. This means that the time being in the university is an opportunity for growth and as such the number of individuals who attend university tends to increase from one year to another. Enrolment to the university has increased by 31.24% within 10 years between 2013 and 2023 and the numbers are expected to continue increasing (4).

As most university students in Malaysia starts enrolling at 18 years old which is at the stage of late adolescent, the opportunities for growth such as learning to be independent and adapting to new academic challenges are plentiful when attending university (5). These can then positively affect their psychological well-being consequently improving their self-esteem and resiliency (6, 7). However, most studies on university students focus on the negative experiences of university students due to the increase prevalence of mental health issues among them. The National Health and Morbidity Survey conducted on 2022 sampling adolescents in every state of Malaysia with a sample size 33,523 found the prevalence of depressive symptoms to be 26.9% while prevalence of having suicidal ideation is at 13.1% (8). Common mental health issues developed by university students include anxiety disorders (9, 10) and depressive disorders (8) with a global prevalence median of 34.8%

(9) to 33.6% (10) respectively. University students were also found to be at risk of eating disorders, suicidality, and substance use (11, 12). Other disorders that may not be common are obsessive compulsive disorder, insomnia disorder, and bipolar disorder (13). Findings from studies among university students in Malaysia reflect the same pattern in which the prevalence of university students presenting with abnormal anxiety symptoms is 60.5% and 45.6% for depressive symptoms (14). Eating disorders can also be found among university students in Malaysia with a prevalence of 13.9% (15).

Factors that can be attributed to the increased risk of mental health issues among university students can be categorized into academic, social, and psychological factors (11). The difficulty of the chosen course and the pressure to perform academically are examples of academic factors while social isolation and disadvantaged socioeconomic backgrounds are examples of social factors (11, 16). Chronic stress and experience of traumatic events on the other hand are considered psychological factors (11, 14). One psychological factor that researchers may overlook is the role of thoughts. There are numerous frameworks that highlight the importance of thoughts as predictors of mental health. Cognitive behaviour therapy framework for example views the interaction between cognition, behaviour, emotion, and physiological reaction highlighting the importance of cognition by identifying core beliefs, dysfunctional assumptions, automatic thoughts, and cognitive distortions (17). Lazarus appraisal theory proposes that one's stress level is influenced by their primary appraisal which is how one provides meaning to the events they are experiencing (18) similar to automatic thoughts that arise when encountering an event (19). Individuals tend to process the events in a biased manner which then systematically distorts their perception of their experiences leading to a variety of errors in their cognitions also known as cognitive distortions (20). Therefore, the presence of negative automatic thoughts during the primary appraisal will most likely increase their stress experience and consequently increases the risk of mental health issues (21, 22).

Past studies tend to focus on the association between negative automatic thoughts on mental health issues among university students such as anxiety (23, 25) and depression (23-26). The relationship can be attributed to the cognitive theory suggesting that the internalized anxiety symptoms arise from faulty thought patterns (23) such as ruminative thinking and thoughts related to personal failure (25). Thought suppression on the other hand is a faulty thought pattern that can be attributed to increase in symptoms of depression (25). Numerous studies consistently found a significant positive association between negative automatic thoughts and depression (23-26) ranging between significant moderate correlation ($r = .607$ (22); $r = .630$ (23)) to strong correlation ($r = .750$). Hou et al. (24) suggested that the negative automatic thoughts can be attributed to early negative life experiences that biases their memory search particularly during stressful situation. Automatic activation of cognitive resources to focus on negative information and negative self-referent content increases the likelihood of developing depressive symptoms (23, 24). Negative automatic thoughts regarding difficulty to build satisfying social connections in the university was also found to be significantly associated with depressive tendencies (26). This provides additional perspective towards the role of belongingness hypothesis on cognitive biases and consequently the development of mental health issues. Past studies provide meaningful discussions on the role of negative automatic thoughts on mental health but only focus on one side of the coin. On the flip side, it can also be beneficial to explore the relationship between negative automatic thoughts on the positive aspect of well-being.

Aslan and Tolan (27) found a significant association between the reduction of negative automatic thoughts and positive psychological well-being ($r = -.647$, $p < .01$). Positive psychological well-being includes elements of positive relationship, feeling of efficacy, and having a meaningful life (27). This suggests that low negative automatic thoughts can also increase positive relationships, feeling of efficacy and having a meaningful life. However, Aslan and Tolan (27) only explored overall positive psychological well-being scores without analyzing the specific domains of positive psychological well-being. Increase in self-esteem was found to be another benefit of having lower negative automatic thoughts. Hiɜdurmaz et al. (25) found a significant correlation between automatic negative thoughts and self-esteem ($r = .553$, $p < .01$). The positive direction is due to the scoring of Rosenberg Self-Esteem Scale such that higher score indicates low self-esteem while lower score indicates higher self-esteem. Negative automatic thoughts was also found to be a significant predictor to self-esteem ($\beta = .393$, $p < .001$) of 530 university students. These suggest that there is a need to shift the focus on the negative automatic thoughts as a risk factor for development of mental health issues to the importance of reducing negative automatic thoughts in order to increase positive aspect of psychological well-being. By shifting the focus from a risk factor to a potential protective factor, researchers can also shift from an intervention standpoint to a more preventative framework. One gap that exists to further expand this outlook is by exploring other aspects of psychological well-being. The Ryff's Scales of Psychological Well-being for example provides an overall score of positive psychological well-being at the same time offer deeper interpretations of the score based on the sub-scales of autonomy, environmental mastery, personal growth, positive relations with others, purpose of life, and self-acceptance (28). Therefore, the current study aims to expand the understanding of negative automatic thoughts and positive psychological well-being among

university students. Specifically, the study aims to identify the mean score of negative automatic thoughts based on type, determine the interactions between sociodemographic variables, negative automatic thoughts, and psychological well-being, in addition to determining the interactions between frequency of negative automatic thoughts and the domains of psychological well-being.

MATERIALS AND METHODS

Design

This is a cross-sectional study conducted between October 2024 to January 2025 among students from a public university in Malaysia which is Universiti Teknologi MARA (UiTM). The university was selected because it has the highest reach among students' population as it has campuses in all states of Malaysia (29). When including the main campuses and the satellite campuses, UiTM has a total of 34 campuses in Malaysia (29). A survey was conducted by distributing questionnaires through a link using Google Form and participation is on voluntary basis.

Participants and Procedures

Sample size was determined using GPower software considering medium effect size, .95 power, and five predictors which equate to a total sample size of 138. Due to the cross-sectional design, 10% was added to the total sample size to account for incomplete submission or missing data hence final sample size of 151. A non-random purposive sampling method was used in which the link to the questionnaire was given to only students from UiTM that fit the inclusion criteria which are: i. currently registered for a degree program at UiTM as a student; ii. no intention to drop out of the university within one year; iii. able to read and write equivalent to a second-grade level. Exclusion criteria includes: i. diagnosed with any organic illness; ii. diagnosed with any psychiatric disorders.

Ethical Consideration

Written approval to conduct this study was obtained from the Human Research Ethics Committee of Universiti Sains Malaysia (JEPeM) (JEPeM Code: USM/JEPeM/KK/24030271) as well as Research Ethics Committee of Universiti Teknologi MARA (Reference Number: REC/07/2024 (ST/MR/135)). All researchers involved have obtained Good Clinical Practice certificates ensuring that the study was conducted according to the ethical guidelines of the Declaration of Helsinki. Informed consent form was presented to each participant and written consent was obtained before participants answered the questionnaire.

Measures

Data was collected using questionnaire that consists of three sections which are sociodemographic information, 15-item Automatic Thoughts Questionnaire-Malay (15-ATQ-Malay), and Ryff Psychological Well-being Malay translated scale. The sociodemographic information contains items regarding participants' age, gender, hometown, level of education, university program they are currently enrolled in, current semester, monthly allowance, and number of siblings.

The 15-items Automatic Thoughts Questionnaire-Malay (15-ATQ-Malay) is based on the Automatic Thoughts Questionnaire (ATQ) by Hollon and Kendall (30). The measurement was developed to measure the frequency of negative thoughts to differentiate depressed and non-depressed individuals based on 30 items that are unidimensional. Each item is rated on a 5-point likert scale ranging from 1 (not at all) to 5 (all the time). Netemeyer et al. (30) then further reduced the items to 15 items with high reliability (Cronbach's alpha = .92) and good construct validity with comparative fit index, incremental fit index, and non-nomred fit index of .91, .91, and .89 respectively. Similar high reliability was also found in the Malay translated ATQ with Cronbach's alpha of .93 and good concurrent and discriminant validity (30). The current study also found high reliability (Cronbach's alpha = .94). Total score was used such that higher scores indicate greater frequencies of negative automatic thoughts.

Ryff's Scales of Psychological Well-being was developed by Ryff and Keyes (28) with various versions. The original measure contains 83 items while the shortest version contains 18 items. Ryff and Keyes (28) conceptualize psychological well-being based on six domains which are autonomy, environmental mastery, personal growth, positive relations with others, purpose in life and self-acceptance. Ryff's Scales of Psychological Well-being was found to have good reliability with internal consistency coefficient of .93 (32) and the 18 items version was found fit based on weighted least square estimations with adjusted goodness-of-fit index of .89 suggesting very good fitting model (28). The Malay translated version was found to have acceptable reliability with Cronbach's alpha of .75 (33). The current study also found acceptable reliability for overall psychological well-being (α = .70). Exploratory factor analysis found similar factors loading to the Malay translated psychometric properties in which the items loaded into less factors than suggested by Ryff and Keyes (28). However, the items still reflect the multidimensionality of psychological well-being which are positive relationship growth, environmental mastery, and autonomy (33). The current study found five main factors with Cronbach's alpha ranging from .48 to .73. Factors with questionable to poor reliability were not included in the study. Therefore, only two factors were used which are positive relationship growth (α = .73) and autonomy (α = .68). The Cronbach's alpha for the total score based on the two domains was found to be within the acceptable range (α = .79).

Data Analysis

The Statistical Package for Social Science (SPSS) version 26.0 was used to analyze the data. Data cleaning was conducted first before descriptive statistics were obtained for all variables of interest particularly the sociodemographic background, negative automatic thoughts, and psychological well-being. Following that, Pearson product moment correlation coefficient between measurements was obtained before multiple linear regression analysis was used to evaluate the interaction between the predictor which is negative automatic thoughts based on scores obtained from 15-ATQ-Malay and the outcome which is psychological well-being based on score obtained from Ryff's Scales of Psychological Well-being. Separate multiple regression analyses were also conducted for each domain of psychological well-being which are positive relationship growth and autonomy.

RESULTS

The sample of the current study consists of 156 UiTM students with more female students (76.3%, n=119) compared to male students (23.7%, n=37). Most of the students are Malay (95.5%, n=153) with Islam as their religion. However, there are few students from other religious background which is Christianity (1.9%, n=3). Due to the presence of UiTM campuses in all states of Malaysia, the hometown also covers the whole of Malaysia with some of the top states being Selangor (15.4%, n=24), Johor (12.8%, n=20), Perak (12.2%, n=19), and Kelantan (10.3%, n=16). All the students are currently pursuing their studies in healthcare related fields such as nursing, physiotherapy, occupational therapy, medical imaging, or medical lab technology. Majority of the participants are first year students (70%, n=109). Detailed information regarding sociodemographic information and other characteristics can be found in Table I.

Table I: **Sociodemographic and other characteristics of the sample (N=156)**

Variable	Mean±SD
Age	19.02±1.44
Monthly allowance	403.15±249.49
Number of siblings	4.10±1.55
	n (%)
Gender:	
Male	37 (23.7)
Female	119 (76.3)
Race:	
Malay	149 (95.5)
Kadazan/Dusun	1 (0.6)
Kedayan	1 (0.6)
Melanau	2 (1.3)
Iban	3 (1.9)
Religion:	
Islam	153 (98.1)
Christian	3 (1.9)
Level of education:	
SPM	82 (52.6)
STPM	1 (0.6)
Pre Diploma	5 (3.2)
Diploma	68 (43.6)
Hometown:	
Johor	20 (12.8)
Kedah	14 (9.0)
Kelantan	16 (10.3)
Melaka	3 (1.9)
Negeri Sembilan	6 (3.8)
Pahang	11 (7.1)
Perak	19 (12.2)
Perlis	2 (1.3)
Pulau Pinang	8 (5.1)
Sabah	3 (1.9)
Sarawak	10 (6.4)
Selangor	24 (15.4)
Terengganu	8 (5.1)
Wilayah Persekutuan Kuala Lumpur	10 (6.4)
Wilayah Persekutuan Putrajaya	2 (1.3)
University program:	
Nursing	32 (20.5)
Medical lab technologist	43 (27.6)
Medical imaging	42 (26.9)
Physiotherapy	34 (21.8)
Occupational Therapy	5 (3.2)
Year of study:	
First year	109 (69.9)
Third year	42 (26.9)
Fourth year	5 (3.2)

Mean scores of negative automatic thoughts based on types

Table II shows all the items from the 15-ATQ-Malay scale. Each item from the 15-ATQ-Malay scale represents cognitive distortions introduced by Beck (34) and Burns (35) such as personalization, all-or-nothing thinking, overgeneralization, mental filter, and disqualifying the positive. Since the response format range from "Not at all" valued at 1 to 5 "All the time", a mean closer to the value of 5 suggest a higher mean score of the negative automatic thoughts. The type of thoughts that centers around personalization such as "What is the matter with me?" and "What's wrong with me?" is suggested to have the highest mean of 2.63 and 2.42 respectively. However, when calculating the mean score from all statements related to personalization (mean=2.25), overgeneralization appears to have the highest mean score of 2.35. This is due to certain negative automatic thoughts related to the theme of personalization having low mean score such as "I am a loser" (mean=1.89) and "I can't get started" (mean=2.00). Students tend to have lower mean score for thoughts that are catastrophizing (mean=1.60) specifically thinking that they are not able to move forward with their university journey ("I don't think I can go on") or not being able to see the value of their decision to enter the university which is a type of thoughts that disqualifies the positive ("It's just not worth it", mean=1.65).

Correlation among study variables

The only sociodemographic variable that is significantly associated with the outcome variables is age, but the correlation is weak. As age increases, negative automatic thoughts increase ($r = .187$; $p < .05$). Negative automatic

Table II: **Mean score of specific Negative Automatic Thoughts**

No.	Items	Type	Mean	SD
1	I'm no good.	Labelling	2.31	.818
2	Why can't I ever succeed?	Mental filter	2.19	.917
3	No one understands me.	Overgeneralization	2.35	1.021
4	I don't think I can go on.	Catastrophizing	1.60	.941
5	Nothing feels good anymore.	Disqualifying the positive	1.94	.889
6	What's the matter with me?	Personalization	2.63	1.078
7	I can't get started.	Personalization	2.00	.894
8	I wish I could just disappear.	All-or-nothing thinking	2.05	1.233
9	What's wrong with me.	Personalization	2.42	1.010
10	I'm a loser.	Personalization	1.89	.981
11	My future is bleak.	Jumping to conclusions	2.08	1.041
12	I feel so helpless.	Emotional reasoning	2.13	1.033
13	There must be something wrong with me.	Personalization	2.31	.955
14	It's just not worth it.	Disqualifying the positive	1.65	.934
15	I can't finish anything.	Jumping to conclusions	1.79	.865

thoughts was found to be significantly correlated with positive relationship growth (r = -.711, p < .01), autonomy (r = -.547, p < .01), and overall psychological well-being (r = -.723, p <.01) in a negative direction. This means that the less frequent negative automatic thoughts is significantly associated with the experience of increased positive relationship growth, autonomy, and psychological well-being among university students. Table III presents detailed information regarding the correlation between all variables.

Predictors of Psychological Well-being

Table IV presents the result of multiple linear regression between negative automatic thoughts and the main outcome which is psychological well-being indicating that an increase in negative automatic thoughts significantly predicts lower psychological well-being (B = -.403, SE = 0.31, β = -.723, t = -12.970, p < .001) explaining 52.2% of the variance. Further analysis on the domains of psychological well-being which are positive relationship growth and autonomy found similar significant prediction with different variance explained by negative automatic thoughts such that negative automatic thoughts explained 50.6% variance for positive relationship growth (B = -.316, SE = 0.25, β = -.711, t = -12.560, p < .001) while only explaining 30% variance for autonomy (B = -.177, SE = 0.22, β = -.547, t = -8.115, p < .001). This means that an increase in negative automatic thoughts significantly predicts lower positive relationship growth and autonomy with a large effect size.

Table IV: Regression coefficients of the relationship between predictors (negative automatic thoughts) and the outcome of psychological well-being and its domains (positive relationship growth and autonomy)

Outcomes	Predictor	B	SE	β	t	p-Value	R^2
Main outcome							
Psychological Well-being	Negative Automatic Thoughts	-.403	.031	-.723	-12.970	.000	.522
Outcome Domain							
Positive Relationship Growth	Negative Automatic Thoughts	-316	0.25	-.711	-12.560	.000	.506
Autonomy	Negative Automatic Thoughts	-.177	.022	-.547	-8.115	.000	.300

*p < .05; **p < .01

DISCUSSION

This study aimed to determine the mean score of negative automatic thoughts based on type and its relationship between sociodemographic variables, negative automatic thoughts, and psychological well-being among students at a public university in Malaysia. When comparing each negative thought statement individually, the thought of "What is wrong with me?" which is a specific type of cognitive distortion called personalization where individuals attribute external events or situations directly to oneself (32, 33), was found to be the highest mean score of negative automatic thoughts reported. However, when combining the mean scores for each statement related to personalization, the overall mean score was reduced, and the highest mean score is for the thought "No one understands me."

Table III: Pearson Product Moment Correlation between sociodemographic variables, negative automatic thoughts and psychological well-being and its domains which are positive relationship growth and autonomy

Variables	Mean±SD	1	2	3	4	5	6	7
1 Age	19.02±1.44							
2 Level of education	2.38±1.47	.306**						
3 Monthly allowance	403.15±249.49	.041	.046					
4 Number of siblings	4.10±1.55	.220**	.061	-.155				
5 Negative automatic thoughts	31.37±10.76	.187*	.121	.125	.055			
6 Psychological well-being	35.79±6.00	-.130	-.075	-0.94	.000	-.723**		
7 Positive Relationship Growth	19.08±4.78	-.151	-.071	-.061	.009	-.711**	.901**	
8 Autonomy	17.18±3.48	-.046	-.015	-.079	-.049	-.547**	.764**	.481**

*p < .05; **p < .01

which can be attributed to a type of cognitive distortion called overgeneralization. Both Beck (34) and Burns (35) define overgeneralization as having a broad and global negative conclusion based on a negative event in life.

These findings expand on the variability of the type and severity of negative automatic thoughts reported in different academic populations (36, 37). For example, Benhalilem and Hartani (36) found that emotional reasoning and jumping to conclusion to be the types of negative automatic thoughts with high mean scores when they collected data from Sidi Bel Abbes University students in Algeria while Rimawi and Al-Masri (37) found overthinking and all-or-nothing thinking to have among the highest reported mean score among Al-Quds University students in Palestine. When compared to findings from late adolescents who are in eleventh grade, negative automatic thoughts with theme of selective abstraction and personalization appear to be among the highest reported mean score compared to all-or-nothing thinking, overgeneralization, understatement, and catastrophic thinking (38). Furthermore, the mean score of each theme of negative automatic thought is consistent with findings from Lawati (38) compared to Benhalilem (36) and Rimawi (37). One possible reason for the low mean score among the sample of the current study is that most of the students are Malay with Islam as their religion. Past studies have shown that high religious intrinsic religious orientation among Muslim to be significantly associated to lower automatic negative thoughts with themes of overgeneralization and should statements (39). Using religion as a coping strategy has also shown to reduce symptoms of distress through cognitive reappraisal (40). It is suggested that those with high religious coping are associated with significantly better ability to reframe their negative experiences. It is possible that the students sampled from current study may have similar coping ability as they face various challenges in the university.

With regards to findings from the current study, overgeneralization being the highest mean score among the university students could be explained based on the dual process theory in which the brain can make decisions that can be either logical and reliable or heuristic and less reliable (41). Heuristics or mental shortcuts can be beneficial in critical situations where quick decision making is needed or to reduce the brain from being overwhelmed to process the complexity of details happening in daily life. However, these heuristics can also create cognitive biases where the mind takes one situation and uses it to explain everything which is related to overgeneralization (41). The tendency to use cognitive biases increases in stressful situations (42) which also explains the increase in overgeneralization as students continue to experience various types of stressors from attending universities be it academic, social, and psychological stressors (11).

It is also important to give some highlight on negative automatic thoughts focusing on personalization even when it is the second highest after calculating for combined mean score since when taken individually, the negative automatic thought of "What is wrong with me?" has the highest mean score among the UiTM students in Malaysia. This can be explained based on Erik Erikson's psychosocial development theory (43). Most adolescents in Malaysia stay with their parents as they complete secondary school (44) and start living independently away from their parents as they enter university. This shift of having more autonomy also translates to owning the responsibility of any negative outcomes that occur, which is a key aspect of personalization. Erik Erikson's psychosocial development theory may also explain the higher mean score of negative automatic thoughts that are attributed to the self. The age range of the participants in the current study is between 18 to 24 years old with a median age of 18 years old. This is typically the age of late adolescents as they transition to young adulthood (43). It is common for individuals at this age to develop personal identity with the expectation of discovering their own personal identity irrespective of their parents and peers. It is possible that during this process, they also tend to personalize any negative thoughts they experience.

In addition to this, other items related to negative automatic thoughts such as "I'm a loser" and "I can't get started" fits the personalization theme but have lower mean score could be explained by the thoughts being more specific. Compared to "What is wrong with me?" which is more open-ended and allow for the participants to think about their various weaknesses, "I'm a loser" and "I can't get started" is more specific to one personal characteristic or difficulty. A better understanding could be obtained thought different methodology such as using the qualitative approach to explore the reason behind their thoughts. There is a need to better understand the mechanism of these negative automatic thoughts since according to the cognitive triad (34), having thoughts that either overgeneralizes or personalizes negative life events put a person's psychological well-being at risk as it influences views about oneself as flawed or undesirable, views about the world not being on the person's side, and views about the future being too challenging therefore increase self-doubt, loneliness, and hopelessness. These in turn increase the risks of various mental health issues (23-26).

A weak but significant relationship between age and frequency of negative automatic thoughts such that as age increases, the frequency of negative automatic thoughts increases. This is consistent with findings from Farrell et al. (45) who explored life's stress at different stages of development. They found that stress experienced during early childhood and adolescence shows an upward trajectory which predicts negative

health outcomes in middle adulthood (3). Similarly, this can also be explained by Erik Erikson stages of psychosocial development such that the need to go through discovering personal identity and forming intimate relationships while transitioning to being independent on top on managing academic demands become sources of stress (21, 22) that consequently increase the likelihood of cognitive biases (23-26).

Another important finding from the current study is that we can predict that university students who rarely have negative automatic thoughts will have significantly better psychological well-being which is consistent with the findings by Aslan and Tolan (27). Individuals who have lower negative automatic thoughts were found to have significantly higher psychological well-being which is attributed to being less worried about other people's negative perception of them. The current study further explored the specific domain of psychological well-being that benefitted from the reduction of negative automatic thoughts. Lower negative automatic thoughts was found to predict higher positive relationship growth and autonomy. The negative relationship between the variables is consistent with findings from Sirin (46) in which university students with high cognitive distortions tend to easily reject others and have higher anxiety regarding the attachments that they have built with their peers. The finding regarding negative automatic thoughts as a significant predictor to autonomy is also consistent with past study in which individuals who are less occupied with their negative automatic thoughts tend to have good sense of control over their actions and behaviours (45).

Therefore, the current study found that university students tend to have higher mean score for negative automatic thoughts on overgeneralization and personalization. Reducing the frequency of negative automatic thoughts can then predict higher psychological well-being specifically positive relationship growth and autonomy. A preventative approach to managing negative automatic thoughts can be beneficial to university students. By reducing the negative automatic thoughts, individuals can better focus on positive relationship growth. This is supported by the current findings that decreasing negative automatic thoughts increase positive relationship growth and autonomy. Individuals who have high autonomy is suggested to be more independent and self-determining and regulate their behaviours through internal locus of control (45). Individuals with high positive relationship growth on the other hand will have a feeling of continued development towards their personal relationship and are more open to new experiences (45) which is important in the process of adapting to new expectations and responsibilities as university students (11).

Despite recruiting adequate participants, findings generalizability must be done with caution as the sampling was inclusive from a single type of institution. Moving forward, researchers can also consider the use of alternative psychological well-being measures as certain domain was found to have low reliability based on Cronbach alpha's value. This could be due to various factors with cultural mismatch being a possible reason (47). The current research selected the psychological well-being scales due to the psychometrically sound properties (28) while being supported by the psychometric properties of the Malay translated scale with good reliability and validity (33). However, it appears that for university students, their understanding of psychological well-being may be defined by limited domains in which other measurements of psychological well-being might be more suitable such as from Deci and Ryan (48) where psychological well-being arises when the basic psychological needs for autonomy, competence, and relatedness are satisfied or a more universal measure developed by the World Health Organization (49) that measures psychological well-being based on the domains of positive affect, calmness, vigor, restorative sleep, and general interest. Future studies can also expand on the findings from the current research by exploring significant skills needed by the students to manage their cognitions to reduce the occurrence of negative automatic thoughts and achieve better psychological well-being as they complete their university education. A skill-training as a preventative approach to managing automatic thoughts can be beneficial to university students. Deriving from the cognitive therapy framework, several cognitive skills can be equipped by the students to better manage their thoughts such as thoughts record, cognitive restructuring, and cognitive diffusion (50). Future researchers can further explore these skills as possible preventative measures for university students to safeguard their psychological well-being.

CONCLUSION

We determined the relationship between sociodemographic variables, negative automatic thoughts, and psychological well-being among university students in Malaysia. Important findings from the study suggest that negative automatic thoughts increase as the age increases and university students with low negative automatic thoughts have better overall psychological well-being in addition to higher positive relationship growth and autonomy.

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