

Original article

**Enhancement of Knowledge and Attitude level on Depression via Knowledge,
Depression and Adolescents (KDA) Puzzles**

Neni Widiasmoro Selamat, Jagathisswary Gobu, Irwanto, Dian Dwi Sary, Norshafarina Shari Kamaruddin, Muhammad Afiq Zaki, Ariafandi Selamat, Afni Isnaeni Selamat, Tengku Idzzan Nadzirah Tengku Idris, Haliza Baharudin

Address for correspondence: Dr. Neni Widiasmoro Selamat, Faculty of Health & Life Sciences, Management & Science University, Shah Alam, Selangor, Malaysia.
Email: neni_widiasmoro@msu.edu.my

Abstract

Background: In Malaysia, mental health issues among individuals aged 16 years and above have an upward trend. It was also found to be highest among adolescents aged between 16 to 19 years old compared to other age groups. Their knowledge about the causes was inaccurate, and deficiency of understanding about depression makes this mental health issue remain untreated. A person's good attitude toward seeking treatment for this problem was related to their knowledge of mental health too.

Objectives: To enhance knowledge and improve attitude on depression via a newly-developed puzzle-based education program among adolescents in Kuala Selangor.

Methods: An interventional study involved convenience sampling. It was performed on 100 adolescents aged between 15 to 19 years old from Kuala Selangor tuition centres. The Adolescents Depression Knowledge Questionnaire (ADKQ) was used to assess knowledge and attitudes concerning depression at pre and post-intervention. This research began with ethical approval, pre-intervention, intervention, and post-intervention. KDA-Puzzles intervention consisted of eight sets of modules designed as jigsaw puzzles to improve depression and attitude level knowledge.

Result: Mean age was 16.70 ± 1.42 years. The level of knowledge at post-intervention (0.99 ± 0.04) was higher than pre-intervention (0.45 ± 0.14), and also a significant improvement in attitude level was found at post-intervention ($p\text{-value} < 0.001$).

Conclusion: KDA-Puzzles intervention could potentially improve the knowledge and attitude toward depression. The findings offer an alternative solution in tackling depression issues among adolescents via knowledge empowerment.

Keywords: Intervention, Depression, Knowledge, Attitude, Adolescents

Introduction

Mental health education was effective and successful in increasing mental health knowledge, help-seeking attitudes, decreased stigma and also increased willingness to help others [1]. Adolescents understanding of its causes was inaccurate, and lack of knowledge about depression makes the mental health issue remain untreated [2]. In Malaysia, the present report revealed that the prevalence of emotional well-being issues such as mental health problems in individuals of 16 years and above demonstrates an expanding pattern [3]. The depression level among people aged 16 and above in Selangor was found to be 29.3% [3]. At the end of the day, mental health problems were regularly higher among adolescents between ages 16 to 19 years old (34.7%) compared to other age groups [4]. Studies concerning intervention approaches to improve knowledge on depression, especially among adolescents, are limited [5]. A better knowledge on mental health has a clear relationship with the positive help-seeking attitude of a person [5]. Therefore, this depression education program was designed as KDA-Puzzles and used in this intervention approach to enhance the knowledge and attitude level of depression among adolescents.

Methods

Research design

This was an interventional study designed to improve knowledge and attitude level of depression among adolescents [5-7]. A convenience sampling method was used. A self-administrated questionnaire was distributed before and after the intervention to assess the outcome among the adolescents.

Selection of sampling area

Kuala Selangor was selected in this study as a sampling area located in Selangor, Malaysia.

Selection of sample and eligibility criteria

Adolescents between 15 to 19 years' old who were attending tuition centers in the Kuala Selangor area at the time of data collection were invited to participate in this study. A total of 100 participants were chosen for this study. Adolescents who met the inclusion criteria were selected for this study. The inclusion criteria were adolescents who can read, write, or understand and can communicate in Bahasa Malaysia and English. The next inclusion criteria were adolescents who were capable of completing questionnaires in written or verbal form and provided written agreement for participation from parents or caregivers. Potential participants who did not match the inclusion requirements were excluded from participating.

Study instruments

The data was collected by using the Adolescent Depression Knowledge Questionnaire (ADKQ). Gender, age, ethnicity, and parental marital status were the socio-demographic characteristics examined in this study. The questions were divided into two parts. Part one was based on demographic data, while part two was ADKQ. There were a variety of screening instruments available and accessible to identify depression in people. ADKQ was a standout among the most widely utilized instruments for adolescents.

Adolescent Depression Knowledge Questionnaire (ADKQ): It was used to assess identification and changes in knowledge and attitude among adolescents. ADKQ was developed as a result of several types of research conducted collaboratively by many experts on the literature and the background experience on knowledge [8]. The ADKQ was designed to be used as a measure of knowledge among adolescents on depression at pre-and post-intervention. The ADKQ can also be used to assess help-seeking behaviour using open-ended questions, as well as depression literacy. There were 13 yes or no questions known as binary questions and two questions about symptoms of depression and mania. There were also four questions to assess student's attitudes on help-seeking [8].

The questionnaire was readily available in English. The information and questions in this research instrument were translated into national language for local use. Firstly, the translation process began by translating the questionnaire into a targeted language which was Bahasa Malaysia. After translating into the Malay language, the questionnaire was translated back to English which was the original form, in order to have a similar sense of effectiveness. The translated English version was then compared to the original English version to ensure that the research items' content was consistent.

KDA-Puzzles: There were eight sets of jigsaw puzzles designed such as modules. KDA-Puzzles was developed after a thorough review of current mental health programs' literature [9, 10].

Module 1	Sign and symptoms of depression
Module 2	Types of depression
Module 3	Causes of depression
Module 4	Risk factors of depression
Module 5	Pharmacotherapy & medication) Medical treatment A
Module 6	Medical treatment B
Module 7	Alternative treatments
Module 8	Prevention of depression among adolescents

Data collection process

The data collection process took place for three months, starting from 1st December 2019 until 29th February 2020. It involved ethical approval, pre-intervention, intervention and post-intervention.

Students that met the inclusion criteria were chosen one day before the study began. Day 1 began with a briefing, followed by the distribution of a written inform form, assent form, and research information sheet. On day 2, pre-intervention was initiated after the written inform form and assent form was collected from respondents. ADKQ was distributed individually in pre-intervention. The questionnaire's content was thoroughly explained to respondents to ensure they understood it. The students responded to the questionnaire within the specified time given. The questionnaire consists of two sections. Thus it required approximately 10 minutes to complete. The intervention study took place after collecting the completed questionnaire. The same participant from the pre-intervention was chosen for the intervention study. The students were separated into groups to complete the eight sets of jigsaw KDA-Puzzles in the allocated duration of 40 minutes. Each group received a KDA-Puzzles booklet where the content consisted of English and Bahasa Malaysia. Once the intervention study was completed, after 10 minutes, the post-intervention began. The same ADKQ questionnaire was distributed individually to test the outcome of the intervention approach. The questionnaire was given the same 10-minute duration to complete. Refer to figure 1 below.

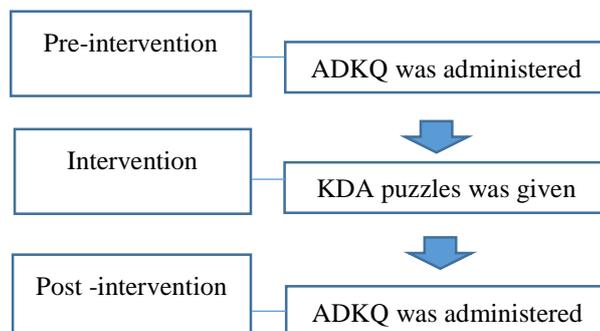


Figure-1: Flow chart of the data collection process

Data analysis

SPSS statistics was used to analyse all the data where the data were edited, coded and entered into SPSS. This normality test was important to ensure the distribution of the variables that were used in the analysis was normal. There were many ways used to discover this assumption graphically, such as stem and leaf plot, histogram, box plot and normal probability plot. Furthermore, Kolmogorov Smirnov statistic was used for the normality test. A frequency test and paired t-test were done.

Ethical consideration

Ethical approval (Reference No: MSU-RMC-02/FR01/11/L2/018) was obtained from Research Management (RMC) of Management & Science University (MSU). Hence, consent of the survey was attached together with the survey questions. Prior to data collection, participants agreed and signed a consent form, and only their data were retrieved and used for the study. The data was kept private and confidential, and all participants stayed anonymous regardless of the outcome.

Results

One hundred adolescents (male adolescents $n= 37$ and female adolescents $n= 63$) participated in this intervention approach. The participants were from 15 to 19 years old. The average age was 16.70 ± 1.42 . The majority of the respondents were Indian (58.0%), female (63.0%) and parental marital status who were married and living together (83.0%). In contrast, the least proportion of respondents consisted of Chinese (1.0%), followed by male respondents (37.0%) and parental marital status, which were married and living apart (2.0%) and unknown (2.0%). The level of knowledge on depression at pre-intervention approach 0.45 ± 0.14 was lower than the post-intervention approach 0.99 ± 0.04 . At the post-intervention approach, the knowledge was found to have very significantly improved at the $p < 0.001$ (Table-1).

Table-1: Comparison of knowledge level among adolescents during pre-intervention and post-intervention

Intervention	Mean	Standard deviation	95% Confidence Interval of the Difference		Sig (2 tailed) <i>p</i> -value
			Lower	Upper	
Pre-intervention of KDA-Puzzle	0.45	0.14			
Post-intervention of KDA-Puzzle	0.99	0.04	-0.562	-0.506	0.000

Summarizes the responses for the 13 yes-no questions, which statistically had demonstrated significant improvement from pre-intervention and post-intervention (Table-2).

Table-2: Comparison on number of correct answers on knowledge section in ADKQ among adolescents

ADKQ Questions	Pre-intervention Correct answer		Post-intervention Correct answer	
	<i>N</i>	Percentage %	<i>N</i>	Percentage %
1. Five percent of all teenagers will suffer a Major Depression	36	36.0	96	96.0
2. Major Depression is a normal part of adolescence	37	37.0	97	97.0
3. Depression runs in some families	53	53.0	99	99.0
4. Depression can be controlled through willpower	34	34.0	100	100.0
5. The cause of Major Depression is well known	44	44.0	97	97.0
6. A change in behavior is a symptom of depression	69	69.0	99	99.0
7. There are certain groups of people who are immune to depression	41	41.0	99	99.0
8. Major Depression is a treatable medical illness	62	62.0	100	100.0
9. A person with depression always feel sad	26	26.0	94	94.0
10. The abuse of alcohol and drugs can be a sign of depression	60	60.0	100	100.0
11. Bipolar Disorder is more common than Major Depression	48	48.0	100	100.0
12. Major Depression is a curable illness	30	30.0	100	100.0
13. Someone who has a major always develops a depressive illness	46	46.0	100	100.0

Question 14 focused on depressive symptoms, whereas Question 15 was concerned with mania symptoms. The ability of adolescents to list out the depression and mania symptoms had improved post-intervention when compared with pre-intervention. In pre-intervention, only 8.0% of the adolescents were able to list out five symptoms of depression correctly compared to post-intervention; hence the outcome improved by 90.0%. While the number of adolescents who were able to answer correctly on the two symptoms of mania was only 5.0% at pre-intervention and at post-intervention, it was improved to 92.0%. The changes in the mean of symptoms of depression and mania were found to be statistically significant at $p < 0.001$ (Table 3).

Table-3: Number of symptoms of depression and mania listed by adolescents on the pre-intervention and post-intervention

Question 14: Number of correct depressive symptoms listed	Pre-intervention		Post-intervention	
	Frequency <i>N</i>	Percentage %	Frequency <i>N</i>	Percentage %
0	34	34.0	0	0
1	20	20.0	0	0
2	19	19.0	0	0
3	12	12.0	2	2.0
4	7	7.0	8	8.0
5	8	8.0	90	90.0
Question 15: Number of correct manic symptoms listed				
0	86	86.0	1	1.0
1	9	9.0	7	7.0
2	5	5.0	92	92.0

As stated in the table below, questions 17-19 were from the ADKQ's attitude section, while item 16 was dichotomous and thus was not included in coding analyses. In this attitude section, all 100 respondents responded (Table-4).

Table-4: Attitudes section of ADKQ among adolescents

Categories and sample responses	Pre-Intervention		Post-Intervention	
	N	%	N	%
17. Who would you seek for help?				
a) Family	60	60.0	80	80.0
b) Mental Health/Medical Professional	19	19.0	37	37.0
c) School-Based Adults:	10	10.0	20	20.0
d) Peers: "Friend"	62	62.0	76	76.0
e) Miscellaneous				
- Trusted person or someone who listen to you	11	11.0	23	23.0
18. What would make you difficult or stop you to seek for help?				
a) Emotional/embarrassment/stigma	62	62.0	47	47.0
b) Social/interpersonal	28	28.0	16	16.0
c) Depression/treatment issues	6	6.0	6	6.0
d) Nothing should get in the way	22	22.0	48	48.0
19. What would you do if a friend told you he or she is depressed and asked you to keep it a secret because no one else knows?				
a) Tell someone	23	23.0	92	92.0
b) Keep it secret	76	76.0	8	8.0

Discussion

Knowledge and attitude level of depression among adolescents: The aim of the KDA-Puzzle intervention approach was to improve knowledge and attitude level of depression among adolescents who were attending tuition centers in Kuala Selangor. Intervention on knowledge and attitude level of depression via jigsaw puzzles gained more benefits without depending on any social media or network access. Research on intervention approaches from puzzles based education programs to improve the knowledge and attitude level of depression among adolescents has never been done before in Malaysia. Therefore, knowledge and attitude about mental health appeared as the main aims for intervention as the rate of health knowledge, especially mental health knowledge in emerging economies such as Malaysia, is low [3, 5].

Comparison of the knowledge level on depression at pre-intervention and post-intervention based on KDA-Puzzle: The level of knowledge on depression at pre-intervention approach 0.45 ± 0.14 was found to be lower than post-intervention approach 0.99 ± 0.04 as shown in table

1 and table 2. At the post-intervention approach, the knowledge was found to have improved very significantly at $p < 0.001$. At pre-intervention, the overall scores were found to be lower than post-intervention when the closer examination was done among the individuals in yes/no question, which were found to be the same as previous study when using the same ADKQ item [8]. Based on the examination of the individual questions versus the total score, several question students had adequate knowledge before the intervention approach. At pre-intervention, more than half of respondents were able to identify that changes in behaviour are a symptom of depression (Question 6). About 69.0% of the respondents were able to identify this at pre-intervention, while at post-intervention, 99.0% of them were able to identify it clearly. Similarly, more than half of adolescents were able to answer it correctly (Question 8) that 'major depression is a treatable illness (correct answer= yes)' and (Question 10) 'misuse of alcohol and drugs could be a sign of depression (correct answer= yes). Conversely, the scores and percentages on all these questions improved on the post-intervention after the KDA-Puzzle intervention. At post-intervention, 100.0% agreed that major depression could be treated, which was higher than the recent study done in Cameron. Only 85.0% accepted that major depression could be treated with pharmacology and psychotherapy [11]. Where the adolescents understood and were aware that major depression can be treated and changes in the behaviour or using drugs or alcohol could be signs and symptoms of [12, 13].

There were five questions that had the excellent improvement from pre-intervention to post-intervention from Part B which the first (Question 1) 'five per cent of all teenagers will suffer a Major Depression (correct answer= yes)' increased from 36.0% at pre-intervention to 96.0% at post-intervention a changed of 60.0%. According to the National Institute of Mental Health, there was a high proportion of people with major depression among young adults, which classified adolescents as having the highest number of individuals who experience depression [3]. The (Question 2) was 'Major Depression was a normal part of adolescence (correct

answer= no) also had the same changes about 60.0% which was from 37.0% to 97.0% where majority answered correctly at post-intervention. This shows that adolescents became aware that major depression was not a regular part of an adolescent as it can negatively affect a person's life, employment, education, sleeping and general health [13. 14].

Question 4 was 'can depression be controlled through willpower (correct answer=no)' also had major improvement 34.0% at pre-intervention to 100.0% at post-intervention with the changes around 66.0%. Willpower alone cannot be used to control the depression as it was not effective. Based on the recent study, training on stress management and coping together willpower strengthening skills through an intervention based on Granovsky excitement components only could promote psychophysical health [15]. Based on the intervention study, the majority of the respondents were aware that depression is known as a treatable medical illness. This was proved when they had significant improvement at post-intervention for Question 12, 'Major Depression as curable medical illness (correct answer= no)' were 100.0% of them agreed that it was not curable illness with the differences of 70% from pre-intervention. In comparison with the study done in Cameron for knowledge assessment, only 67.2% of the respondents from Cameron believed depression could be improved without medication which was lower than the post-intervention KDA-Puzzle [11]. Therefore, it was found that adolescents from Kuala Selangor were aware that depression cannot be cured or controlled only with willpower but can be treated with appropriate treatment [14]. Question 9 was 'did a person with depression always sad' (correct answer= no), which also had significant enhancement from pre-intervention 26.0% to post-intervention 94.0% with the differences of 68.0%, where it shows that the adolescents appeared to have a gap in knowledge. As known, people with depression more often experience mood changes, irritable or angry mood often than sadness [3, 12]. This was found to be an important division for an adolescent to understand and become aware to recognize the disorder in themselves or in others potentially.

Deficiency of knowledge about symptoms of depression may lead to delay in seeking help which may cause the worsening of disorder to the level that it can cause difficulty to treat. This intervention approach on knowledge of signs and symptoms of depression is able to reduce mortality and will also lead to a lessening of the economic burden imposed by morbidity related to it [16]. At pre-intervention, the level of awareness and knowledge to list down the symptoms of depression and mania were found to be lower compared to post-intervention. The changes in the mean of depressive and manic symptoms were found to be statistically significant at $p < 0.001$.

Question 14 was on symptoms of depression, and question 15 was on symptoms of mania, as shown in table 3. The ability of adolescents that listed out the symptoms of depression and mania had improved post-intervention compared with pre-intervention. At pre-intervention, only 8.0% of adolescents were able to list out five symptoms of depression correctly compared on the post-intervention the outcome was improved to 90% with the changes of 82.0%. The majority of the respondents correctly reported lack of pleasure, interest, saddening, hopelessness, low mood, lack of concentration, frequent headache, unhappy, irritable and feeling the pressure as symptoms of depression. In a previous study, the same symptoms of depression were listed down by the respondents [12-14].

Mania/bipolar disorder, was not as common as major depression or dysthymia. Dysregulation of brain functioning and genetic factors are often the cause of the bipolar disorder [17]. Mania often affects thinking, judgment, and social behaviour in ways that might cause serious problems and embarrassment. It involves cycles of depression and elation or mania where the mood changes from extreme highs (mania) to extreme lows (depression) [18]. In a recent study, it was found that in Malaysia, the stigma of mental health disorders was well known, especially among people suffering from schizophrenia, bipolar disorder and depression [19]. The number of adolescents who were able to answer correctly on the two symptoms of mania

was only 5.0% at pre-intervention, and on post-intervention, it was enriched to 92.0% with the differences of 87.0%. At pre-intervention, the majority of the respondents had a lesser understanding of symptoms of mania, where more than 85.0% of adolescents could not even list one symptom of mania. There was 86.0% of adolescents who were unable to list out any symptoms of mania, 9.0% who were able to list out at least one correct symptom of mania and only 5.0% who were able to list out the correct two symptoms of mania at pre-intervention.

In contrast, at post-intervention, about 1.0% were unable to list out the symptoms, 7.0% were able to list out one correct symptom, and 92.0% were able to list out the correct two symptoms of mania. This finding revealed that the KDA-Puzzles delivered great knowledge on symptoms of mania to adolescents. Even though mania was less common than depression, the consequences, if untreated, among adolescents were extremely severe [14].

Differentiation of the attitudes section of ADKQ among adolescents at pre-intervention and post-intervention: Findings revealed that negative attitudes and deficiency of knowledge about depression and the treatment had been recognized as obstacles to seek help [2]. The questions in the attitudes section provided a great chance to differentiate pre to post-intervention changes. Moreover, increasing knowledge together with changing negative attitudes about depression was found to be an important target in this intervention approach [5, 20]. Based on the open-ended question on attitude done in the KDA-Puzzles intervention approach, the changes of attitude from negative to positive was found to be the greatest improvement, as shown in table 4. The help-seeking behaviours were seen to have increased especially at post-intervention 80.0% of adolescents preferred to seek help from family, 76.0% friends, 37.0% mental health, 23.0% from someone they trusted, and the least was 20.0% from the school-based adults. In contrast, at pre-intervention, only 62.0% of adolescents preferred to seek help from friends, 60.0% family, 19.0% mental health, 11.0% someone they trusted, and only 10.0% from a school-based adult. Compared from pre-intervention to post-intervention, adolescents help-

seeking behaviours changed to a wide range as they preferred more than one person to seek for help. The positive attitude improved well after the KDA-Puzzle intervention [1, 5].

There were many aspects that stopped or refused people from seeking help for themselves or for their friends. A person could hide their psychological and emotional concerns and refuse treatment if there was fear, such as stigma from society [5]. At pre-intervention, 62.0% of adolescents felt seeking help as an emotional embarrassment or as a stigma, but at post-intervention, the number decreased to 47.0% with the changes of 15.0%, where it shows a slight decrease in a negative attitude. Around 28.0% at pre-intervention stated that help-seeking might lead to social or interpersonal effects where for example, they felt it could be as fear of breaking the trust of the person. This attitude changed at post-intervention to 16.0% with the changes of 12.0%. In addition, there were fewer respondents with the same number at pre-intervention and post-intervention who stated that depression or treatment issues also became an issue for them to seek help. Stigma and discriminatory attitudes towards depression have been revealed to limit depressed people to seek help [20]. On the other side, there were a small group of adolescents with a positive attitude who felt nothing would stop them from seeking help at pre-intervention it was 22.0%, while at post-intervention, it increased to 48.0%. This shows that there was an increase in a positive attitude towards help-seeking over here. Finally, item 19 was about keeping a friends depression a secret or tell someone. At pre-intervention, 76.0% preferred to keep a secret and 23.0% preferred to tell someone. In contrast, at post-intervention, 92.0% preferred to tell someone and seek help and solution for those who were depressed. This clearly shows that the adolescent's positive attitude on help-seeking level significantly increased. People with a higher degree of literacy in mental health were likely to have positive attitudes towards seeking professional help, greater interest in supporting people with mental health problems, and fewer stigmatizing views and attitudes towards mental health issues [21]. The data suggested that an increased level of knowledge on depression eventually

causes an increased mental help-seeking attitude. Similar findings were found in the recent study done in Malaysia [1, 5].

To conclude, in a nutshell, KDA-Puzzle was discovered to be intrinsically compelling, with attractive colors and a variety of modules. It also succeeded in its goal of significantly increasing adolescent's knowledge and attitudes toward depression in general. The goal was to produce better and more knowledgeable adolescents in the future, particularly for people from rural communities. More intervention approaches based on depression knowledge should be implemented in rural areas. People should be educated on the implications of ignoring the necessity of having a correct understanding and adequate knowledge of depression.

The limitation in this study was the involuntary consent control and limitation on the duration of study. The parent's consent form was compulsory since some respondents were still underage. Besides that, the Covid-19 outbreak has prevented the research team from approaching students in schools. Another limitation was the number of respondents from Chinese ethnic adolescents was lower.

The future plan is to implement KDA-Puzzles intervention via mobile application and also further exploration involve larger sample size which will cover both public and private schools. The next focus will utilize digital intervention on improvement of knowledge and attitude of depression which are able to reach a wider population.

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Neni Widiasmoro Selamat, Faculty of Health & Life Sciences, Management & Science University, Shah Alam, Selangor, Malaysia; Jagathisswary Gobu, School of Graduate Studies (SGS), Management & Science University, Shah Alam, Selangor, Malaysia; Irwanto, Department of Child Health, Faculty of Medicine, Airlangga University/RSUD Dr. Soetomo. Jl. Mayjen Prof. Dr. Moestopo 6-8 Surabaya 60286, East Java, Indonesia; Dian Dwi Sary, Department of Child Health, Faculty of Medicine, Airlangga University/RSUD Dr. Soetomo.

Jl. Mayjen Prof. Dr. Moestopo 6-8 Surabaya 60286, East Java, Indonesia; Norshafarina Shari Kamaruddin, Faculty of Health & Life Sciences, Management & Science University, Shah Alam, Selangor, Malaysia; Muhammad Afiq Zaki, Centre of Environmental Health and Safety, Faculty of Health Sciences, Universiti Teknologi MARA Cawangan Selangor, Kampus Puncak Alam, 42300 Bandar Puncak Alam, Selangor, Malaysia; Ariafandi Selamat, Department of Cell Technology Research & Development, Hanwha Q Cells Malaysia Sdn Bhd, 63000 Cyberjaya, Malaysia; Afni Isnaeni Selamat, Faculty of Business Management and Professional Studies, Management & Science University, Shah Alam, Selangor, Malaysia; Tengku Idzzan Nadzirah Tengku Idris, Faculty of Health & Life Sciences, Management & Science University, Shah Alam, Selangor, Malaysia; Haliza Baharudin, Faculty of Health & Life Sciences, Management & Science University, Shah Alam, Selangor, Malaysia.