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**AUTISM SPECTRUM QUOTIENT: COPING STRATEGIES AND
PSYCHOLOGICAL HEALTH OF SECONDARY SCHOOL
STUDENTS**

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Abstract

The purpose of this study is to examine if there is any significant difference among secondary school students with different levels of autism spectrum quotient in terms of the coping strategies (problem-focused and emotion-focused coping) and the psychological health (stress, anxiety and depression) which are vital in mental health among the different levels of autism spectrum quotient. A total of 539 secondary school students were recruited by using purposive sampling method. There are 3 measurements in this research which includes Autism-spectrum Quotient (AQ-Adolescent Version), BRIEF COPE and Depression, Anxiety and Stress Scale (DASS-21). In this research, the result of ONEWAY ANOVA shows no significant differences in both the problem-focused and emotion-focused coping strategies. However, the results show that there are significant differences in stress, anxiety and depression among the four levels (low, the average, above average and very high) of autism spectrum quotient (AQ). The results also show that the psychological health of this group of secondary school students has been compromised compared to other groups of secondary school students. It is suggested that early interventions should be taken by the government to identify at an early stage for these potential students of Autism-spectrum Quotient and to provide suitable help to reduce the negative impact on their psychological health and to improve their coping strategies.

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1. Introduction

Autistic adolescent cases in Malaysia are on the rise although most Malaysians either are ignorant or lack knowledge about children and adolescents who are dealing with autistic problems (Dolah, Yahaya, & Chong, 2011; Tan & Yadav, 2008). For these Malaysians, the awareness regarding autism among the children and adolescent is very low compared to some other countries. Generally, they would regard autism as a little-understood disability and most of the time they would perceive it as a social stigma towards the patient (Nettleton, 2008). In view of this, quantified autism researches will enable the local community to understand the challenges faced by autistic children and adolescents, and at same time drawing people's attention to understand the educational and occupational outcomes of people with Autism Spectrum Disorder (ASD) during adolescence and adulthood stages (Seltzer, Smith, & Maenner, 2012).

1.1. Autism and Autism Spectrum Quotient

Autism has been conceptualised as a distinct behavioural syndrome, characterised by impairments in social interaction and communication coupled with restricted, repetitive or stereotyped patterns of behaviour, interests and activities (American Psychiatric Association, 1994). Researchers started to develop the interest to conduct quantitative research among secondary school students with different Autism Spectrum Quotient levels in coping and psychological health strategies among the general population (Rosbrook & Whittingham, 2009). The Autism spectrum Quotient-Adolescent Version (AQ) was developed due to the lack of a quick and quantitative self-report instrument for assessing how many autistic traits any adolescent displays in the general population (Baron-Cohen, Hoekstra, Knickmeyer, & Wheelwright, 2006). Adolescents with different levels of autism spectrum quotient displayed different patterns of behaviour when they react to stressors (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). This measurement which assesses the autistic traits on a continuous scale has the possibility to identify the related autistic traits which in turn assists the family to gain insights of these traits (Grove, Baillie, Allison, Baron-Cohen, & Hoekstra, 2013).

2. Problem Statement

To relate Autism Spectrum Disorder with coping and psychological health actually involves a reaction focused on coping and changing psychological health level within the context of an unfavourable personal environment (Lazarus, 1993). For instance, imbalance psychological health level like stress, anxiety and depression are the most frequent comorbidity disorder among high level autistic adolescents when the suitable coping strategies are not being adapted (Ghaziuddin & Zafar, 2008).

Due to society's ignorance of Autism Spectrum Disorder, different levels of autistic adolescents nowadays do not have appropriate coping skills or understand the importance of psychological health and hence experience difficulties in social life (Lin, Orsmond, Coster, & Cohn, 2011). As such, it is hoped that by comparing coping strategies and psychological health of secondary school students with different levels of Autism-Spectrum Quotient, the present research would be able to provide insights to the policy makers and educationists to incorporate in their future educational plans thus helping students acquire

appropriate life adapting skills to cope with life and to build a better framework for psychological health (Alloy, Riskind, & Manos, 2005).

3. Research Questions

In this research, there are total 5 research questions,

RQ1: Is there any significant difference in problem-focused coping strategies among secondary school students with different levels of the autism-spectrum quotient.

RQ2: Is there any significant difference in emotion-focused coping strategies among secondary school students with different levels of the autism-spectrum quotient.

RQ3: Is there any significant difference in stress among secondary school students with different levels of the autism-spectrum quotient.

RQ4: Is there any significant difference in anxiety among secondary school students with different levels of the autism-spectrum quotient.

RQ5: Is there any significant difference in depression among secondary school students with different levels of the autism-spectrum quotient.

4. Purpose of the Study

The research objectives in this study focus on examining undetected autistic individuals and to compare the different levels of autism spectrum quotient of undergraduates in coping strategies and psychological health which includes stress, anxiety and depression.

5. Research Methods

In this research, the survey method with purposive sampling method is used for obtaining data. Participants were undergraduates. The “Autism Spectrum Quotient (AQ)-Adolescent Version” instrument was used to measure the autistic levels of adolescents, BRIEF-COPE to measure the coping strategies and DASS-21 to measure the psychological health condition including stress, anxiety and depression of undergraduates.

5.1. Participants

This research recruited a total of 539 participants whose age ranged from thirteen to eighteen (13-18), and all the participants in this study are secondary school students in Perak, Malaysia. In the participant selection criteria, all the participants must be the student from the secondary school and below 18 years old. Since the research needed only secondary school students to participate in this research, samples were recruited by using purposive sampling method which is a type of non-probability sampling technique. The participants are from 3 secondary schools, each of the school selected 4 classes respectively and allowed the researcher conduct the data collection.

5.2. Apparatus

The research questionnaires consist of participants' demographic data, Autism Spectrum Quotient, Brief COPE & Depression, and Anxiety & Stress Scale (DASS-21). The Autism spectrum Quotient-

Adolescent Version (AQ; Baron-Cohen et al., 2001) is a standardized self-report measurement designed to measure the degrees to which adolescents with normal intelligence have the traits associated with autism spectrum. It comprises 50 questions. The purpose of the measurement is to determine the extent of autism traits in normal intelligence people. Approximately 50% of the items were worded to produce a “disagree” response and approximately another 50% of the items were expected to elicit the “agree” response, among high scoring participants with Autism Spectrum / High Functioning Autism instrument. For example, “Definitely agree” or “slightly agree” responses scored 1 point, on the following items: 1, 2, 4, 5, 6, 7, 9, 12, 13, 16, 18, 19, 20, 21, 22, 23, 26, 33, 35, 39, 41, 42, 43, 45, 46. As an example, “Definitely disagree” or “slightly disagree” responses scored 1 point, on the following items: 3, 8, 10, 11, 14, 15, 17, 24, 25, 27, 28, 29, 30, 31, 32,34, 36, 37, 38, 40, 44, 47, 48, 49, 50. The overall scoring of the autism quotient are categorized into 4 scoring categories, 0-10 is low, 11-22 is average, 23-31 is above average and 32-50 is very high (most people with Asperger or high-functioning autism score about 32-35) and 50 is the maximum score of the autism spectrum quotient, but fewer participants scored the optimum score of 50 (Baron-Cohen, Wheelwright, Skinner, Martin, & Clubley, 2001). In this research, the Cronbach’s alpha score for the autism spectrum quotient is ($\alpha=0.66$).

The second measurement the BRIEF COPE measures the coping strategies. This measurement is divided into 2 main sub-scales which are problem-based coping scores (the sum of responses to items 2,7,10, 14, 23, and 25) and emotion-based coping scores (the sum of items 1, 3, 4, 5, 6, 8, 9, 10, 11, 12, 13, 15, 16, 17, 18, 19, 20, 21, 22, 24, 26, 27, and 28), and it is 4 point Likert-scale, ranging from 1 (I haven’t been doing this at all) to 4 (I’ve been doing this a lot). The BRIEF COPE Cronbach’s alpha score for the measurement is 0.82. However, there is no overall score on this measure of BRIEF COPE (Asl, 2018; Carver, 1997; Tuncay, Musabak, Gok, & Kutlu, 2008). In this research, the Cronbach’s alpha score for this measurement showed 0.72.

The Depression, Anxiety, and Stress Scale - 21 Items (DASS-21) is a set of three independent self-report scales designed to measure the negative emotional states of depression, anxiety and stress. It is a 4-point Likert scale ranging from 0 (Never) to 3 (Almost Always). Each of the three DASS-21 scales contains 7 items. Each of the scales is independent and sum up the total score of the 7 items by multiplying 2 to get the final score. The Depression scale is to measure hopelessness, devaluation of life, self-deprecation and lack of interest/involvement for the individual (items 3, 5, 10, 13, 16, 17, 21). The anxiety scale assesses situational anxiety, panic attack and experience of anxious affect (items 2, 4, 7, 9, 15, 19, 20). The Stress scale (items 1, 6, 8, 11, 12, 14, 18) assesses difficulty in relaxing, nervous arousal and impatience. The scores for Depression, Anxiety, and Stress are calculated by summing the scores for the items (Lovibond & Lovibond, 1995). In this research, the Cronbach alpha for the overall measurement is 0.88. For the stress scale (7 items), the Cronbach alpha is 0.72, the anxiety scale (7 items) is 0.73 and the depression scales (7 items) is 0.74.

5.3. Procedure

Five hundred and thirty-nine copies of the questionnaires were distributed to the participants in 3 secondary schools in Perak state. Each participant was asked to read the instruction before they participated in this research. During the data collection, the estimated time to complete the survey was 25

to 30 minutes for each participant, which was according to the answering time slots allotted. The researcher stood nearby to provide necessary assistance to the participants if they faced any difficulties.

5.4. Data Analysis

After completing data collection, all the raw data were analyzed using the Statistical Techniques for Social Science (SPSS) version 20. ONE-WAY ANOVA, an inferential statistical technique was used to analyze different levels of autism spectrum quotient among secondary school students in the problem-focused coping strategies, the emotion-focused coping strategies, stress, anxiety and depression. Selecting ONE-WAY ANOVA as the main method as this method allow the researchers to study the significant levels without increasing the alpha size (Vernoy & Kyle, 2002).

6. Findings

6.1. Autism and Problem Focused Coping Strategies

The result of ONE-WAY ANOVA showed that there was no significant different among different levels of autism spectrum quotient, low ($M=16.50, SD=0.71$), average ($M=17.10, SD=2.73$), above average ($M=16.55, SD=2.87$) and very high ($M=17.30, SD=2.77$) in using the problem-focused coping strategies, $F(3,538) = 2.16, p=0.92$.

6.2. Autism and Emotion Focused Coping Strategies

The result of ONE-WAY ANOVA showed that there was no significant difference among the different levels of autism spectrum quotient, low ($M=53.50, SD=2.12$), average ($M=51.70, SD=7.03$), above average ($M=52.06, SD=7.95$) and very high ($M=53.27, SD=6.75$) in using the emotion-focused coping strategies, $F(3,538) = 0.82, p=0.48$.

6.3. Autism and Stress

The result of ONE-WAY ANOVA showed that there was a significant difference among the different levels of autism spectrum quotient in stress, $F(3,539) = 5.21, p=0.001$. The Post hoc comparisons using the Scheffe test indicated that the mean score for stress in the average level of autism spectrum quotient ($M=7.51, SD=4.21$), showed a significant difference with the above average level of autism spectrum quotient ($M=9.03, SD=4.17$), $p=0.001$ (Refer Table1).

Table 01. Source table for scheffe test comparison for stress

Levels of ASQ	Low (n=2)		Average (=229)		Above Average (n=238)		Very High (n=69)		Variance		Post-hoc comparison (Scheffe-test)
	M	SD	M	SD	M	SD	M	SD	F	P	
Stress	7.00	0.00	7.51	4.21	9.03	4.17	8.43	4.30	5.21	0.001	Average-Above Average** Above Average – Average**

Source: **Statistically significant at 1 percent significance level. *Statistically significant at 5 percent significance level

In term of the coping strategies, the findings of this study show that there is no significant difference among the different levels of autism spectrum quotient in choosing problem and emotion-focused coping strategies. Children and adolescents with autistic traits look like normal student in class and thus difficult to be observed in class. These adolescents may adopt similar coping strategies to cope with their problem. Nonetheless, the findings of this result show that there are significant differences among the different levels of autism spectrum quotient in their levels of stress, anxiety and depression. In other words, these unidentified adolescents with higher levels of ASD do face more mental problems than those with lower levels of ASD. This is a warning sign for educators, as the current findings reveal that there are possible cases of autism among the secondary school students, and many of them are facing negative psychological health development as there is no appropriate psychological support is available for them. Therefore, it is imperative for the educators and the government to develop strategies to identify these hidden cases of ASD, and set up special classes for the autistic secondary school students to use appropriate strategies to cope with their problems.

6.4. Autism and Anxiety

The result of ONE-WAY ANOVA showed that there was a significant difference among the different levels of autism spectrum quotient in anxiety, $F(3,539) = 2.79, p=0.05$. The Post hoc comparisons using the Scheffe test indicated that the mean score for anxiety in the average level of autism spectrum quotient ($M=6.30, SD=4.19$), showed a significant difference with the above average level of autism spectrum quotient ($M=7.32, SD=4.12$), $p=0.05$ (Refer Table 2).

Table 02. Source table for scheffe test comparison for anxiety

Levels of ASQ	Low (n=2)		Average (=229)		Above Average (n=238)		Very High (n=69)		Variance		Post-hoc comparison (Scheffe-test)
	M	SD	M	SD	M	SD	M	SD	F	P	
Anxiety	4.50	0.70	6.30	4.19	7.32	4.12	7.33	4.64	2.79	0.05	Average-Above Average** Above Average – Average**

Source: **Statistically significant at 1 percent significance level.

*Statistically significant at 5 percent significance level.

6.5 Autism and Depression

The result of ONE-WAY ANOVA showed that there was a significant difference among the different levels of autism spectrum quotient in depression $F(3,539) = 7.48, p=0.001$. The Post hoc comparisons using the Scheffe test indicated that the mean score for depression in the average level of autism spectrum quotient ($M=4.81, SD=3.90$), showed a significant difference with the above average level of autism spectrum quotient ($M=6.65, SD=4.50$), $p=0.001$ (Refer Table 3).

Table 03. Source table for scheffe test comparison for depression

Levels of ASQ	Low (n=2)		Average (=229)		Above Average (n=238)		Very High (n=69)		Variance		Post-hoc comparison (Scheffe-test)
	M	SD	M	SD	M	SD	M	SD	F	P	
Depression	4.00	4.24	4.81	3.90	6.65	4.50	5.68	4.36	7.48	0.001	Average- Above Average** Above Average – Average**

Source: **Statistically significant at 1 percent significance level.

*Statistically significant at 5 percent significance level.

7. Conclusion

This study aims to examine if there are any differences in the different the levels of autism spectrum quotient in terms of the coping strategies (problem and emotion-focused coping strategies) and the mental health (stress, anxiety and depression) among secondary school students. Generally, the result confirmed that the expectation of the research questions on stress, anxiety and depression, but not on the problem-focused and the emotion-focused coping strategies on different levels of autism spectrum quotient among secondary school students.

7.1. ASD and Future Suggestions

Generally, the research findings show that there was no significant difference in both problem-focused coping strategies and emotion-focused coping strategies on different level of autism spectrum quotient among the secondary school students. However, the research findings show that there was significant difference in stress, anxiety and depression. Since this study only investigated students in the state of Perak as participants, the findings of this study should be cautious in generalizing the findings to all secondary schools in Malaysia. Future researchers may include more participants from different states. In addition, future studies may recruit participants from different age groups, so as to cover a wider range of people from different age groups. Researchers can include participants from primary and secondary schools in the research, as it is believed that there are suspected cases of autism that have gone undetected. Next, in the psychometric properties of autism spectrum quotient, it might not serve as the clinical diagnostic tools for autism, but it reveal hidden autistic hidden cases in the general population of undergraduates. However, comparison of different levels of autism spectrum quotient actually shows that there are differences in the coping strategies and psychological health levels. The instruments in this research, “Autism spectrum Quotient (AQ)-Adolescent Version”, “BRIEF COPE” and “Depression, Anxiety and Stress Scale (DASS-21)” showed a good reliability score and it is adaptable in the Malaysian context.

The research findings can be used by the non-governmental organizations to design early intervention programmes to help the adolescents including undergraduates with autism symptoms and assisting them in adapting in their social life and in the working place. For instance, through the early

intervention programs, the undergraduates can learn to adapt their life in the working place, and to cope with social problems better. Also, non-governmental organization can provide a platform for the autistic children to have a chance to interact with the peers and not being neglected by the society.

This study provides valuable information regarding autistic undergraduates in the tertiary education of Malaysia. Also, the researcher knows there are suspected cases of autism in the actual living environment. Prevention strategies must be introduced to assist the autistic undergraduates in developing better state of psychological health. It is also suggested that government agencies should take preventive action and provide suitable psychological assistance to assist potential undergraduates of high autism spectrum quotient. In conclusion, this study has shown the importance of exploring different levels of autism spectrum quotient among the undergraduates in coping strategies and psychological health levels.

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