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AUTISTIC TRAITS PROFILES AMONG UNDERGRADUATE STUDENTS IN MALAYSIA: A DESCRIPTIVE ANALYSIS

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ABSTRACT

Autistic traits (ATs) describe characteristics and features associated with autism, which are thought to be continuously distributed in the general population. Exploration of ATs in the general population is important as it can inform the understanding of both autistic and non-autistic populations. Extending this idea, an understanding of the distribution of ATs within certain environments and settings may be useful in developing strategies for supporting those with specific needs associated with their level of ATs. ATs are divided into social behavior (with sub-factors of social skills, routine, switching, and imagination) and fascination with numbers or patterns. Therefore, this study aims to evaluate the internal consistency of the Autism Quotient short (AQ-28) instrument had used in this study, evaluate the pattern of ATs among undergraduate students at a university in Malaysia, and compare the findings between this study with the original AQ -28. We examined self-reported ATs using a newly translated Malay version of the AQ-28. Participants were 1344 Malaysian undergraduate students who completed an online survey. The internal consistency of the AQ-28 Malay version is 0.708 and descriptive analysis indicates the mean score for ATs was 66.88 (*SD* = 7.00) among the samples. Thus, an analysis of sub-trait scores was also made, and comparisons were made with previous studies (results from the original AQ-28), by comparing non-clinical groups. Overall, this study provides further support for the idea that the expression of ATs is diverse across the student.

Keywords: Autistic Traits, Undergraduate Students, Malaysia, AQ-28

INTRODUCTION

The Autism Spectrum Disorder (ASD) phenotypes are known as sub-threshold autistic traits (Baron-Cohen et al., 2001). Autistic traits also can be defined as subthreshold deficits in social interaction and communication and restricted behaviors, interests, and activities that are continuously distributed in the general population (Constantino & Todd, 2003). Besides that, autistic traits refer to personality and cognitive traits similar to but milder than those observed in those formally diagnosed with ASD (Hyseni

et al., 2019; Landry & Chouinard, 2016). Furthermore, autistic traits encapsulate a broader range of behaviours such as preference for routines, sensitivity to numbers and patterns, and the ability to switch flexibly between tasks (Hoekstra et al., 2011). Autistic traits include pragmatic difficulties, broadly defined communication difficulties, poor social skills, rigidity, broadly defined stereotyped behaviors, impaired emotional recognition, and aloofness. In other words, neuropsychological performance in the general population also extends across the continuum of autistic symptoms (Hyseni et al., 2019). The idea of studying autistic traits was pioneered in 2001 by exploring domains of social skills, routine, switching, imagination and numbers/patterns in 2001 (Baron-Cohen et al., 2001).

Examining autistic traits in general population can serve as 'analogue studies' for ASD, providing access to larger, more easily accessible samples and thus allowing more complex statistical analyses to be conducted (Jackson & Dritschel, 2016). Extending this idea, an understanding of the distribution of autistic traits within certain environments and settings may be useful in developing strategies for supporting those with specific needs associated with their level of autistic traits. Therefore, evaluating autistic traits in a certain population are getting more and more attention globally (Graf et al., 2017; Lei et al., 2020; Uren et al., 2019). Researching autistic traits in the general population is important to understand neuropsychological performance and well-being in ASD, in individuals across the continuum of ASD (Landry & Chouinard, 2016).

Autistic traits are assessed by self-report measures, such as the Autism-Spectrum Quotient (AQ) (Baron-Cohen et al., 2001). The AQ has high internal consistency and test-retest reliability, especially when the 4 points likert-scale scoring was applied (Stevenson & Hart, 2017). Furthermore, the availability of self-reporting scales such as the AQ allows researchers to compare the unique characteristics of individuals who received early and late diagnoses of ASC to non-ASC counterparts (Oomen et al., 2021). Currently, the availability of self-reported screening tools such as the Autism Quotient–Short (AQ-28) (Hoekstra et al., 2011) enables a rapid identification of individuals with high autistic traits in the general population.

LITERATURE REVIEW

There is increased recognition that autistic traits also exist in the general population (Constantino & Todd, 2003; Hoekstra et al., 2007; Mcleod & Anderson, 2022) where autistic traits can have an impact in aspects of one’s life (Low et al., 2023). Individuals with high autistic traits face different issues, which include diagnosis issues, frequent psychological distress, and everyday functional challenges due to their social impairment. Studies on autistic traits can lead to a better understanding of the behaviors associated with autism. According to Takara and Kondo (2014), a considerable proportion of autistic people remain undiagnosed or are misdiagnosed with other psychiatric conditions. Therefore, it is important that the characteristics of people with high autistic traits are studied for a more comprehensive investigation of autistic phenotypes, instead of just narrowly focusing on clinical autism.

For example, several studies evaluate how autistic traits affect psychological distress. Study that evaluated among non-clinical sample found a significant positive correlation between autistic traits and attachment anxiety and attachment avoidance (Gallitto & Leth-Steensen, 2015). Therefore, autistic traits in adults are associated with anxiety, depression, and obsessive-compulsive disorder and is marked by cognitive traits such as weak central coherence, diminished executive functioning, and neurological processing (Rubenstein & Chawla, 2018). In some instances, autistic traits also affect such negative experiences as trigger episodes of depression and acute psychotic attack (Zhou et al., 2018).

In recent years, self-report methods have increasingly been used to profile autistic traits among university students globally (Hoekstra et al., 2011). For countries in Asia such as Malaysia, researchers have used the self-report AQ (Baron-Cohen et al., 2001) as a way to assess autistic traits in the general population (Chee & de Vries, 2021; Freeth et al., 2013). Therefore, self-reporting scales such as the AQ can give allow more focused profiling of behaviours beyond childhood based on behavioral constructs which are more relevant to portray in adulthood adult living experience and psychosocial outcomes (Low et al, 2023). A study in the context of the population in Malaysia has proven the suitability of five domains representing autistic traits with the study finding that the factor structure and measurement invariance of the autistic traits showed fair and good fit (Chee et al., 2023).

There are several prominent studies that utilized the AQ in Malaysia. Study conducted by Chee and de Vries (2021) looked at the responses on the AQ of multilingual Malaysians (96 participants filled out the AQ in English and Mandarin, and 79 participants filled out English and Bahasa Malaysia). The findings of the study found that participants scored higher on the English AQ compared to the Mandarin AQ, whereas there was no difference between the English and Bahasa Malaysia AQ score. Analysis of the response style suggests the same person might display discrepant response styles in different languages, which seems to be related to language proficiency (Chee & de Vries, 2021).

Another AQ study in Malaysia was conducted by Freeth et al. (2013). This study was conducted to evaluate autistic traits of university students between Malaysia, India and the United Kingdom (UK). Through the analysis made it proved that Malaysian and Indian students tended to self-report high autistic traits than UK students. In addition, the study also showed both Indian and Malaysian students scored higher than the participants in the UK on four out of the five domains: communication; social skills; imagination and attention switching. In addition, this study proves that male students scored higher than female students while science students scored higher than non-science students in each culture (Freeth et al., 2013).

However, the AQ to be constantly evaluated and improved. In this study, the abridged version of the Autism Spectrum Quotient Short-version (AQ-28) (Hoekstra et al., 2011) was used to collect data pertaining to the manifestation of autistic traits among Malaysian undergraduate students in a local public university. This original AQ-Short investigated autistic traits that used non-clinical samples from Netherlands and UK (Hoekstra et al., 2011). Otherwise, this study will answer three research questions; (1) what the internal consistency of AQ-28 is obtained in this study, (2) what the pattern of autistic traits is shown among the studied participants, and (3) how is the pattern similar/different from the original AQ-28's study.

METHODOLOGY

An online survey was done to study autistic traits of undergraduate students from a public university in Malaysia. The AQ-28 (Hoekstra et al., 2011) is a 28-item measure designed to assess autistic traits, returning similar psychometric properties to the original 50-item version (Baron-Cohen et al., 2001). In the present study, the AQ-28 was used to provide a continuous assessment of autistic traits. Respondents answer statements on a 4-point Likert scale, from 1 to 4 (range 28–112). The AQ-28 provides an indication of the degree to which an individual possesses traits associated with the autistic spectrum; social skills, attention switching, a preference for routines, imagination and a fascination with numbers and patterns. In the present study, the AQ-28 was translated into Malay by the first author according to recommended guidelines for translating tests (Cohen et al., 2018).

All participants completed basic demographic questions and the AQ-28. Recruitment to the study was based on a stratified sampling method from science and social science. Stratified sampling tends to be more representative of a population because it ensures that elements from each stratum in the population are represented in the sample (Creswell & Creswell, 2018). Stratified random sampling involves dividing the entire population into homogeneous groups called strata. Two groups (science and social science) have been classified based on information obtained by the university where this university consists of 14 faculties in total. Through demographic questions, the sample was asked to state which faculty they were students from. Then, the researcher categorized them in their field of study based on the response they have given.

Participants were 1344 (75.3% female) current Malaysian undergraduate students aged 19–26 years (M = 20.75, SD = 1.32). Participants were drawn across the four years of study, with the largest proportion of students in their first two years of study: Year 1 (n = 490), Year 2 (n = 421), Year 3 (n = 252), and Year 4 (n = 171). Slightly more students were studying science (55.6%) than social science (44.6%). Besides that, the participants were 1012 female students (75.3%) compared to 332 male students. 1082 (80.5%) samples are Malay, 128 (9.5%) Chinese, 54 (4.0%) Indian, and 80 (6.0%) are other ethnic.

RESULTS AND FINDING

The findings of this study are shown based on the three research objectives set.

a) Internal consistency of the AQ-28

Reliability refers to the consistency or repeatability of an instrument. The most important form of reliability for instruments is the instrument's internal consistency; the degree to which sets of items on an instrument behave in the same way. It is important because instrument scale items should be assessing the same underlying construct, so these items should have suitable intercorrelations (Creswell & Creswell, 2018). An alternative measure of reliability as internal consistency is the Cronbach alpha, which is frequently referred to simply as the alpha coefficient of reliability or simply the alpha.

The Cronbach alpha provides a coefficient of inter-item correlations, i.e., each item's correlation with the sum of all the other relevant items. It is emphasized that this is useful for multi-item scales and is a measure of the internal consistency among the items (Cohen et al., 2018). In the testing of the reliability of the measures, Cronbach's alpha coefficient yielded 0.708. Affirming the reliability portrayed in this study, the results showed that the AQ-28 has a acceptable internal consistency, displaying a better reflection of the characteristics of the population. This result explained that the AQ-28 is acceptable and reliable in measuring the response.

b) Pattern of autistic traits among the Malaysian undergraduate students

To answer the second research question, a descriptive analysis was done. Findings found that the AQ-28 mean score for all study participants was 66.88 (*SD* = 7.00). In addition, analysis is also made through all five domains: social skills, routine, switching, imagination, and numbers and patterns as shown in Table 1.

Table 1: Mean Score by Domains (N = 1344)

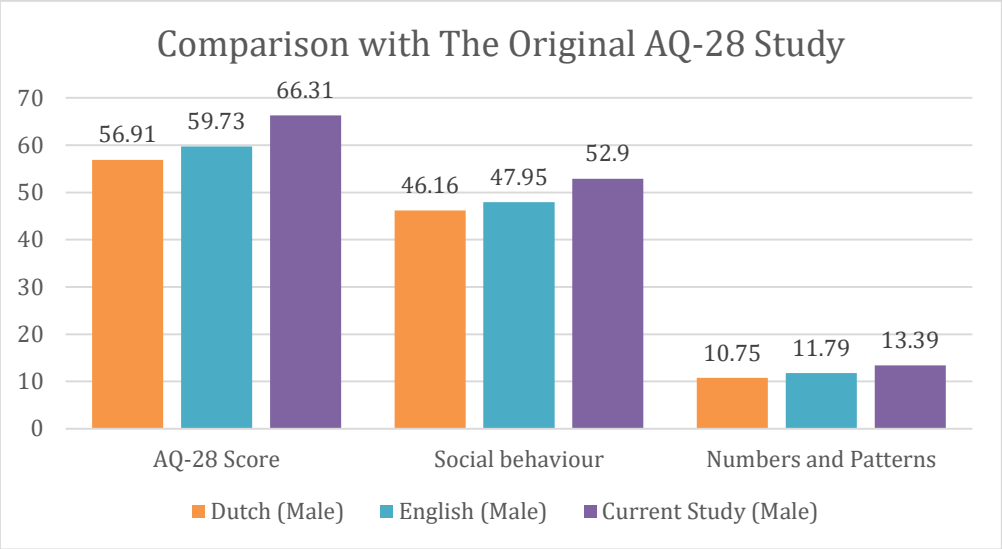
Construct	Mean	Standard Deviation	Minimum – Maximum (Range)
Social skills	16.13	3.44	7 – 28 (21)
Routine	10.65	1.76	4 – 16 (12)
Switching	9.71	1.84	4 – 16 (12)
Imagination	17.31	2.85	8 – 28 (20)
Numbers and Pattern	13.05	2.29	5 – 20 (15)

Based on the analysis made, the mean scores for the sub-constructs are social skills (*Mean* = 16.13, *SD* = 3.44), routine (*Mean* = 10.65, *SD* = 1.76), switching (*Mean* = 9.71 *SD* = 1.84), imagination (*Mean* = 17.31, *SD* = 2.85), and fascination with numbers or patterns (*Mean* = 13.05, *SD* = 2.29). The standard deviation scores showed that social (*SD* = 3.44, *range* = 7 - 28), followed by imagination (*SD* = 2.85, *range* = 8 - 28) revealed notable discrepancy among the study participants. The findings are suggestive of a wide range of diversity presented in these two sub-constructs among the study participants.

c) Comparison with the original AQ-28's study (Hoekstra et al., 2011)

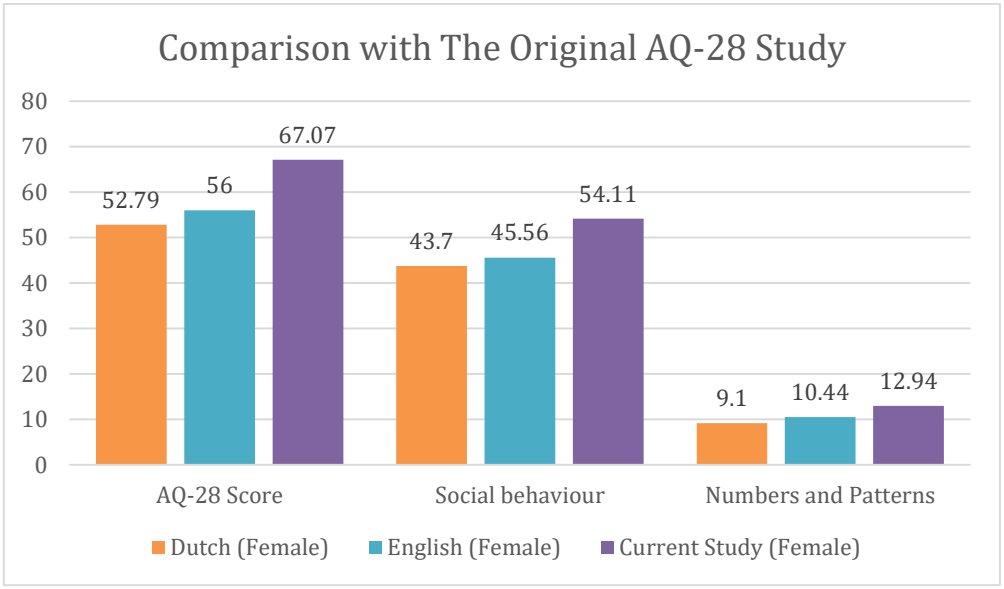
For the third objective of the study, the results of this study were compared with the results obtained based on the original AQ-28 (Hoekstra et al., 2011). However, the comparison was made based on the concept highlighted by the original AQ-28, namely four constructs of autistic traits classified into social behavior (with sub-factors of social skills, routine, switching, and imagination) and a non-social construct represented by fascination with numbers or patterns. A comparison was made with the Dutch and English findings from Hoekstra et al.'s (2011) study. Both sets of data [i.e. the Malaysian data from the current study and the Dutch and English data from Hoekstra et al.'s (2011) study] consisted of data from non-clinical samples. The comparisons are reported in Figure 1 and 2.

Figure 1: Comparison with the original AQ-28 study (Male)



As shown in Figure 1, the mean score from the original study of AQ-28 for Dutch Males is 56.91 (*SD* = 9.32), social behaviour (*Mean* = 46.16, *SD* = 8.31), and fascinating number or patterns is 10.75 (*SD* = 3.18). Therefore, the mean score from the original study of AQ-28 for English Males is 59.73 (*SD* = 8.90), social behaviour (*Mean* = 47.95, *SD* = 8.30), and fascinating number or patterns is 11.79 (*SD* = 2.96). English males show a higher score for AQ-28 score, social behavior, and also numbers and patterns compare to Dutch males. For the current study (male group), the mean score is 66.31 (*SD* = 6.54), where the mean score of this study is higher than the two groups from the original AQ-28 study. This trend is also shown through aspects of social behavior (*Mean* = 52.9, *SD* = 7.30), and numbers and patterns (*Mean* = 13.39, *SD* = 2.30) where the mean score of the current study is higher than the two groups from the original study.

Figure 2: Comparison with the original AQ-28 study (Female)



The same pattern is also shown for females where English females show a high score compared to Dutch females. As shown in Figure 2, the mean score from the original study of AQ-28 for Dutch females is 52.79 (*SD* = 8.06), social behaviour (*Mean* = 43.70, *SD* = 7.27), and fascinating number or patterns is 9.10 (*SD* = 2.90). Therefore, the mean score from the original study of AQ-28 for English

females is 56.00 (*SD* = 8.88), social behaviour (*Mean* = 45.56, *SD* = 7.99), and fascinating number or patterns is 10.44 (*SD* = 3.15). For the current study (female group), the mean score is 67.07 (*SD* = 7.13), where the mean score of this study is higher than the two groups from the original AQ-28 study. This trend is also shown through aspects of social behavior (*Mean* = 54.11, *SD* = 7.16), and numbers and patterns (*Mean* = 12.94, *SD* = 2.23) where the mean score of the current study is higher than the two groups from the original study.

In conclusion, the current study recorded higher mean scores for the AQ score, social behaviour score, and fascination with numbers or patterns score compared to non-clinical samples of Dutch and English. This conclusion is based on the comparison (Figures 1 and 2) that can be seen between male and female groups.

DISCUSSIONS, RECOMMENDATIONS AND CONCLUSIONS

In this study, the internal consistency of the instrument used was evaluated because it helps evaluate the reliability of instruments used to measure the attitudes, opinions, beliefs, or behaviors of individuals or groups. This study has shown that the AQ-28 used in this study has acceptable internal consistency (α = 0.708) and this outcome is almost identical to the original AQ-28's internal consistency. It proves that the items within an instrument are measuring the same construct consistently (Kline, 2011). In addition, this assessment is important because it is crucial in aspects of the study such as assessing psychological traits, attitudes, behaviors, and other latent variables. With this evaluation, the AQ-28 that has been translated can also be used in evaluating autistic traits in future studies.

Therefore, this study examined profiles of autistic traits among undergraduate students. This study consists of a non-clinical sample of undergraduate students from a university in Malaysia. Although there is only one student who has been diagnosed with ASD, the remaining 1343 samples are students who have no history related to diagnosis with ASD. If compared to the overall mean score in this study, it is higher than the mean scores reported by using AQ-28 that have been tested on non-clinical samples (Hoekstra et al., 2011; Lei & Russell, 2021; Lugo-Marín et al., 2019). This trend is also the same when the comparison is made with other studies through all five domains; social skills, routine, switching, imagination (Lugo-Marin et al., 2019), and numbers and patterns (Lei & Russell, 2021; Lugo-Marín et al., 2019).

The results imply that the study's participants represented a wide range of diversity. Universities must put this into practice to meet the needs of students and offer experiences that are fair and worthwhile. The practices covered by the following areas of focus are those that, according to research, can help the university advance diversity and inclusion. All students benefit from having strong social and cultural support networks on campus. However, institutional leaders must demonstrate leadership by developing resources and support systems that are visible, simple to use, and tailored to the needs of students (Gelbar et al., 2014). Universities can and should work to make their neurodiverse students feel more supported and welcome both on and off campus. It's crucial to realize that a student's neurodiversity has no bearing on their learning.

Besides that, various factors that may influence the assessment of autistic traits in this study are seen to be high compared to other non-clinical population studies. It is assumed that the results of this study are influenced by the pandemic situation. The data collection for this study was conducted while the world was still affected by the COVID-19 pandemic. The pandemic is believed to have many psychological effects on people. For example, a nationwide survey in China found that about one-third of respondents suffer from some form of psychological problem, especially among young adults (Qiu et al., 2020). As a result, students' extreme discomfort during the lockdown, trouble adjusting intellectually, and feeling socially alienated were the most significant contributors to emotional issues (Visser & Law-van Wyk, 2021). Similarly, research reported negative psychological effects such as post-traumatic stress symptoms, confusion, and anger (Brooks et al., 2020). It proves that issue of psychological distress that is already very much impactful on certain people’s lives which may lead to psychological distress for communities, especially to students, who have to adapt to new norms while continuing their studies and living their daily lives in many different ways in comparison to the past.

Besides that, this may be due to cultural influence. Cultural influence is seen as a factor that affects the findings of this study. The broad idea that autistic traits are universal is supported by cross-cultural overlap in the items most predictive of an autism diagnosis, but it also shows that there might be cultural variances associated with specific autistic traits (Carruthers et al., 2018). There is also some suggestion that autistic traits may be expressed or interpreted differently in different cultures (Carruthers et al., 2018), which might explain our findings. Specifically, the AQ evaluates behavior against Western (i.e., British) standards, and generally fails to consider cultural influences on behavior; I.e., what might appear atypical to Western culture may not be the case in a different culture (Freeth et al., 2013). This implies that a variety of autistic characteristics are regularly expressed, recognized, and reported in several nations.

RECOMMENDATIONS

Therefore, due to neurological differences, individuals with high autistic traits might process information differently, which impacts their adaptations to their immediate social situations and environments and hence their performance and participation. For example, university students with high autistic traits are associated with issues such as perfectionist tendencies, procrastination, failure to identify strengths and weaknesses, or over-reliance on parents for decision-making (Anderson et al., 2020). Without adequately addressing these challenges, some of these young adults might be exposed to an increasing risk of negative social experiences and also other issues related to the transition process to adulthood. To understand this situation, further studies are suggested to be carried out looking at the comparison between high and low autistic traits groups, not just in general.

CONCLUSIONS

Our study provides the profiles of autistic traits among undergraduate students from a university by comparing the findings of this study with some studies abroad. In addition, only one participant reported a formal diagnosis of autism from the entire sample. Although speculative, it is possible that a larger portion of the students in this study may have met diagnostic criteria for autism, or at the least, reported sub-clinical traits that might indicate the need for support within the education system. The functional and participatory challenges associated with autistic traits point to the need to broaden the standard supports available to students in the universities, tailoring them to the neuropsychological needs and well-being of young adults across the full spectrum of autism in higher education.

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