

## Adolescent Stress: A Multi-Ethnic Asian Perspective

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The purpose of this study was to examine gender and ethnic differences in adolescent stress in a non-Western context; multi-ethnic Malaysia. A Malay language version of the Adolescent Stress Questionnaire was administered to 300 adolescents aged from 13 to 17 years (Mean = 14.4 years). There were no statistically significant differences between genders or the three ethnic groups (Chinese, Indian, and Malay) across the 10 subscales. There was a significant gender x ethnicity interaction for the school performance subscale with Indian boys reporting significantly higher stress. Gender and ethnic differences were evident at the item level with boys reporting higher stress than girls on 12% of the items. For 27 (47%) of the items on the scale the most frequent response was *not at all stressful (or irrelevant to me)*. Discussion highlights the importance of further research on adolescent stress in the Asian context and acknowledges that Western cultural understandings of stress are not necessarily or inevitably the same as that found in Asian cultures.

**Keywords:** stress, adolescence, adolescent stress, Asia, Asian adolescents, cross-cultural differences

### Adolescent Stress: A Multi-Ethnic Asian Perspective

Adolescence can be an engaging, exciting and interesting phase in one's existence where one has successfully transitioned from childhood and is yet to be burdened by the weighty stressors and responsibilities associated with adult working and family life. Adolescence can also be a period of considerable emotional and social turbulence. Developing an ongoing understanding of this stage of life is important and maintaining a focus on adolescent health and wellbeing remains a

significant challenge for 21<sup>st</sup> century researchers. The vast body of research that has already considered adolescent experiences of stress has predominately occurred throughout the Western world. However, when seeking to advance our understanding of adolescent stress, there may be some subtle cross-cultural nuances to consider. In this study we examined gender and ethnic differences in adolescent stress in a non-Western context (specifically multi-ethnic Malaysia).

One of the key sources of stress for adolescents are family factors (parental conflict, lack of cohesion, abuse). A recent study considered adolescent stress and coping across 18 countries (Persike & Seiffge-Krenke, 2016). The 18 nations included Hong Kong and Korea. Across all countries parent-related stress was a ubiquitous source of stress (more so than peer-related stress). This may be “pointing to the importance of autonomy struggles in youth from all cultures” (p. 55). In the countries of East Asia, adolescents reported high levels of parental-related stress and were less active in their efforts to cope with this stress (compared to peer-related stress). The authors suggested that this may reflect the cultural context where adolescent autonomy is viewed differently from the West, and there is an emphasis on self-restraint and obedience to parents. This may add an extra layer of stress to the lives of these adolescents as they strive to understand their place in an increasingly globalised world.

Family factors may play a role in a number of stress related negative outcomes for adolescents. Studies have examined prevalence rates of suicide attempts (SA) and non-suicidal self-injury (NSSI) in Chinese adolescents and Korean students (Liang et al., 2014). These authors reported significant relationships between adolescent stress and both SA and NSSI in their sample; and problems in family cohesion appeared to play a role in this stress-SA/NSSI relationship. There is a relationship between physical abuse and suicidal ideation among Chinese adolescents (Kwok et al., 2013). Mousaviet al. (2016) found a number of correlations between parenting behaviours (such as overprotection, rejection and anxious rearing) and adolescent anxiety. Parental rejection was a significant predictor of

anxiety for Malaysian adolescents while ‘anxious rearing’ was significantly related to anxiety among Chinese adolescents. The other ubiquitous sources of stress for adolescents are school related – academic achievement/success, relationships with teachers, school adjustment. Tan and Yates (2011) note that stress associated with academic problems is “... particularly evident in Asian countries such as China, Taiwan, Singapore, Hong Kong, Japan and Korea where the values of hard work and filial piety inculcated by Confucian Heritage Culture (CHC) traditions and concomitant high expectations of parents, teachers and students themselves often place enormous stresses upon students” (p. 390). Academic and school-related demands and expectations can be a significant source of stress in Chinese, Korean, Singaporean, Malaysian and Indian students (Al-Dubaai et al., 2012; Ashok et al., 2017; Kim & Lee, 2013; Kumar & Talwar, 2014; Liu & Lu, 2011; Tan & Yates, 2011; Yeo et al., 2007).

Studies of Chinese high school students have shown a significant relationship over time between academic stress and subsequent decreases in intrinsic motivation, academic achievement, and increases in amotivation (Liu, 2015; Y. Liu & Lu, 2011); reinforcing the importance of addressing issues of stress in such populations. A recent study of Chinese adolescents examined the effects of school-related stress (conceptualised as an effort-reward imbalance) and family stress on self-reported depression (Guo et al., 2014). After controlling for a number of demographic variables, these researchers found that higher levels of school stress and lower family socio-economic status were related to increased depression levels. Similarly, Shang et al. (2014) noted a relationship between effort-reward

imbalance and increased suicidal ideation in Chinese adolescents.

A study of Malaysian medical students found that high levels of stress, anxiety and depression were significantly associated with an increased likelihood of failing first year medical exams, which highlights the importance of developing effective pre-examination strategies for managing stress among students in high pressure study environments (Yusoff, 2013). A study of Malaysian students at boarding school in Malaysia found teaching/learning-related stressors to be significantly associated with depression and stress (Wahab et al., 2013).

Considering gender differences, studies in a Western context show that girls score consistently higher than boys across a range of stress domains (Byrne et al., 2007; De Vriendt et al., 2011; Moksnes et al., 2016). This gender difference seems to be ubiquitous across a number of contexts and countries (Landstedt & Gådin, 2012; Moksnes & Espnes, 2011; Moksnes et al., 2010). Whether these findings reflect gender differences in exposure to stressful events or whether they are due to gender differences in responsiveness to stressful events, is currently unknown.

However, studies on gender differences in adolescent stress in non-Western contexts report a different pattern of findings. A number of studies from India report significantly higher levels of stress and associated distress for boys (Kumar & Talwar, 2014; Mathew et al., 2015). Sun et al. (2010) document gender differences in stress and depression and note that “Unlike their Western counterparts, Chinese boys suffer more depression than girls...” (p. 173). Similar findings have been reported elsewhere (Liu & Lu, 2012).

There is a vast literature on the assessment of adolescent stress and one of the most influential approaches is that of Byrne et al. (2007) who described the development of the Adolescent Stress Questionnaire (ASQ), which is a revision of an earlier scale developed by Byrne and colleagues (Byrne & Mazanov, 2002). The revised ASQ identifies 10 dimensions of adolescent stress: home life, school performance, school attendance, romantic relationships, peer pressure, teacher interaction, future uncertainty, school/leisure conflict, financial pressure and emerging adult responsibility. The 2007 study showed that stress associated with home life, school performance, future uncertainty, financial pressure, and emerging adult responsibility significantly increased with age. Life seemed to be more stressful for adolescent girls who reported significantly higher levels of stress associated with home life, school performance, romantic relationships, peer pressure, future uncertainty, school/leisure conflict and emerging adult responsibility. Byrne et al. noted that all 10 dimensions of stress were significantly correlated in the expected direction with measures of depression, state and trait anxiety, and self-esteem. Since 2007 the revised ASQ continues to be extensively cited in adolescent stress research (e.g., Darviri et al., 2014; Dass, 2016; Fernández-Baena et al., 2015; McKay et al., 2016; Moksnes et al., 2016; Suldo et al., 2015).

Building on this earlier work with the ASQ in Western cultures the present study sought to: (a) Describe the profiles of adolescent stress as measured by the 10 ASQ subscales (Home Life, School Performance, School Attendance, Romantic Relationships, Peer Pressure, Teacher Interaction, Future Uncertainty, School/Leisure Conflict, Financial Pressure and Emerging Adult Responsibility) in a multi-ethnic Malaysian

sample of Malay, Chinese and Indian adolescents, and (b) consider gender and ethnic differences in stress experiences at both the aggregate subscale level and the individual item level. Subscale level analyses allow comparisons with previous research but, given the relative absence of ASQ-based research with non-Western samples, analysis at the level of items could be informative in developing a preliminary understanding of the stress experience in a multi-ethnic Asian setting like Malaysia. We did not seek to address questions of measurement invariance here, particularly given the relatively small sample subgroups (Meade, 2005). We were simply interested in a descriptive account of the stress experiences in our adolescent sample.

Contrary to much of the Western literature and in line with more recent research in the Asian context, we expected to see significantly higher levels of stress for boys. With regard to the nature of ethnic differences, the literature does not support any definite predictions. A Singapore-based study of Malay, Chinese, and Indian adolescents considered health-related differences in quality of life (Ng et al., 2005). The Indian adolescents reported highest overall quality of life, while Chinese scored higher than the Malays on a number of sub-domains of quality of life. These ethnic differences were not explained by health or socio-economic status which, as the authors noted, "... suggests important cultural differences" (p. 1767). In contrast, a study of Malaysian adolescents suggested that Indians might be more vulnerable to negative outcomes (Kaur et al., 2014).

## Method

### Participants

The participants were students from four public secondary schools. The participants

were recruited on a voluntary basis. There were a total of 300 students (150 males and 150 females). These were 118 (39%) Malay students, 105 (35%) Chinese students, 66 (22%) Indian students, and 11 (4%) students of other ethnicity.

For this research the only inclusion criteria for the study were that the participants were aged from 12 to 17 years and Malaysian citizens. The mean age of the participants was 14.36 years ( $SD = 1.22$ , range = 13 – 17 years).

### Measures

The participants completed a demographic sheet which collected information on their age, gender, race, and current school level. They also completed a language-appropriate version of the ASQ (Byrne et al., 2007). The ASQ scale is a 58-item measure with 10 subscales. Each item is rated on a Likert scale from 1 (*not at all stressful (or is irrelevant to me)*), 2 (*a little stressful*), 3 (*moderately stressful*), 4 (*quite stressful*), to 5 (*very stressful*). The scale has strong psychometric properties and has been used extensively throughout the world.

### Procedure

The research was conducted in four public secondary schools in Kuala Lumpur, Malaysia. A list of schools was provided by the State Education Department (Jabatan Pendidikan Wilayah Persekutuan) and nine schools were chosen based on area of the schools within the city. Of those nine schools, four agreed to participate in the study. The survey was conducted in the classroom with the class teacher present. In order to guarantee participants' anonymity no identifying information was collected.

### Translation of the ASQ

For the purposes of the current study the ASQ was translated into Malay. In all

public or government schools in Malaysia the language of instruction is Malay. The translation of the ASQ from its original version of Australian English to Malay was accomplished following Cull et al.'s (2002) four-step translation procedure. Firstly, the questionnaire was independently translated from English to Malay by three bilingual (fluent in both English and Malay languages) translators (1 Malay, 1 Chinese, 1 Indian). The second step was to compare the three translated versions; the differences between the three versions were observed and the most appropriate words, expressions and sentence structures were chosen to capture the meaning of the items. In step three, two other bilingual translators who had not seen the original version of the ASQ did independent back-translations from Malay back to English. Finally, the two back-translated versions of the questionnaire were compared with the original ASQ questionnaire. This ensured that the forward translation was as complete and precise as possible in terms of conceptual and semantic equivalence.

### **Data Collection**

Prior to conducting the survey, a letter seeking permission to conduct the research was submitted to the respective school principals. A brief research proposal and supporting documents accompanied the letter. Once permission had been granted the researcher then met to recruit students as participants in the research. Students were informed as to the purpose, significance and the associated details of participation.

Interested students were given a personal and a parental consent form. Only participants who obtained their parents' approval (via a returned and signed consent form) were permitted to participate. To ensure anonymity of responses the consent forms were kept separate from the completed questionnaire.

Those who had returned the consent forms were given a questionnaire containing the demographic sheet and the ASQ. The participants spent about 15 to 20 minutes completing the questionnaire and they were reminded that their responses would be anonymous. The study was given approval by the Research Ethics Review Board of the Sunway University Department of Psychology.

## **Results**

### **Subscale Analysis**

The Cronbach's alpha reliabilities for the subscale scores are presented in Table 1. Four of the 10 subscales (Future Uncertainty, School Attendance, School/Leisure Conflict, and Emerging Adult Responsibility) had reliabilities of less than .70.

### **Gender and Ethnic Differences**

The means, *SDs*, and 95% CI's for the ASQ subscale scores (separately for males ( $n = 145$ ) and females ( $n = 144$ )) are presented in Table 1 while ethnic group data (Malay ( $n = 118$ ), Chinese ( $n = 105$ ) and Indian ( $n = 66$ )) are presented in Table 2.

*Table 1*  
Gender Differences on the Adolescent Stress Questionnaire - Subscale Scores

ASQ Subscales	Cronbach 's Alpha	Boys			Girls			F (p)
		M	SD	[95% CI]	M	SD	95% CI	
Home Life	.80	26.3	7.6	[25.0, 27.5]	24.6	8.1	[23.5, 25.9]	5.06 (.02)
School Performance	.77	19.8	5.2	[19.0, 20.7]	18.9	6.3	[17.9, 20.0]	3.93 (.05)
School Attendance	.69	7.4	3.4	[6.9, 8.0]	7.0	3.3	[6.5, 7.6]	1.63 (.20)
Romantic Relationship	.79	11.4	5.2	[10.5, 12.2]	10.2	5.2	[9.3, 11.1]	3.53 (.06)
Peer Pressure	.78	18.4	5.7	[17.4, 19.3]	18.0	6.4	[16.9, 19.1]	0.42 (.52)
Teacher Interaction	.70	17.1	5.3	[16.3, 18.0]	16.1	5.5	[15.2, 17.0]	3.15 (.08)
Future Uncertainty	.58	8.6	2.8	[8.2, 9.1]	8.7	2.9	[8.2, 9.1]	0.00 (.96)
School/Leisure Contact	.66	14.1	4.2	[13.4, 14.8]	14.0	4.7	[13.3, 14.8]	0.24 (.62)
Financial Pressure	.71	11.1	3.9	[10.5, 11.8]	10.9	4.1	[10.2, 11.6]	0.37 (.54)
Emerging Adult Responsibility	.60	7.6	2.9	[7.1, 8.1]	7.4	3.0	[6.9, 7.9]	0.74 (.39)

**Table 2**  
**Ethnic Differences in Adolescent Stress Questionnaire - Subscale Scores**

ASQ Subscales	Malay			Chinese			Indian			F (p)
	M	SD	[95% CI]	M	SD	[95% CI]	M	SD	[95% CI]	
Home Life	25.7	7.8	[24.2, 27.1]	25.4	7.0	[24.0, 26.7]	25.2	9.4	[22.8, 27.5]	0.10 (.90)
School Performance	19.6	5.8	[18.5, 20.6]	19.4	5.0	[18.4, 20.4]	19.0	6.7	[17.4, 20.7]	0.16 (.86)
School Attendance	6.9	3.2	[6.3, 7.5]	7.4	3.1	[6.8, 8.0]	7.6	3.9	[6.7, 8.6]	1.32 (.27)
Romantic Relationship	10.5	5.0	[9.6, 11.4]	10.7	5.1	[9.7, 11.7]	11.4	5.9	[10.0, 12.9]	0.63 (.53)
Peer Pressure	18.0	6.2	[16.9, 19.2]	18.3	5.6	[17.2, 19.4]	18.3	6.8	[16.6, 19.4]	0.06 (.94)
Teacher Interaction	16.4	5.3	[15.4, 17.4]	17.0	5.3	[16.0, 18.0]	16.4	5.8	[14.9, 17.8]	0.29 (.75)
Future Uncertainty	9.0	3.0	[8.4, 9.5]	8.6	2.6	[8.1, 9.1]	8.1	3.0	[7.4, 8.9]	1.83 (.16)
School/Leisure Conflict	14.7	4.6	[13.9, 15.5]	13.5	4.1	[12.7, 14.3]	13.7	4.7	[12.6, 14.9]	2.14 (.12)
Financial Pressure	11.2	4.0	[10.5, 11.9]	11.3	4.0	[10.5, 12.0]	10.3	4.2	[9.2, 11.3]	1.56 (.21)
Emerging Adult Responsibility	7.6	3.0	[7.0, 8.1]	7.5	2.8	[6.9, 8.0]	7.3	3.0	[6.5, 8.0]	0.25 (.77)

A 2 x 3 MANOVA was conducted to examine gender and ethnic differences in subscale scores. Using Wilk's lambda, there was no significant effect of gender on stress subscale scores,  $\Lambda = .94$ ,  $F(10, 274) = 1.69$ ,  $p = .08$ . The separate univariate ANOVAs on the subscale scores are presented in Table 1 and reveal no significant gender effects for any of the individual subscale scores. In contrast, Byrne et al. (2007) reported statistically significant differences on 7 of the 10 subscales, with girls scoring higher than boys.

Using Wilk's lambda, there was no significant effect of ethnicity on stress subscale scores,  $\Lambda = .91$ ,  $F(20, 548) = 1.40$ ,  $p = .12$ . The separate univariate ANOVAs on the subscale scores are presented in Table 2 and reveal no significant ethnicity effects for any of the individual subscale scores. Wilks lambda did indicate an overall gender x ethnicity interaction,  $\Lambda = .89$ ,  $F(20, 548) = 1.63$ ,  $p = .04$ . Separate univariate analyses on the subscale scores revealed a significant gender x ethnicity interaction for the School Performance subscale scores,  $F(2) = 4.15$ ,  $p = .02$ . Further post-hoc analyses indicated that there were no significant differences between male and female Malay and Chinese students. There were significant differences between male and female Indian students with males ( $M = 21.3$ ,  $SD = 5.7$ ) reporting higher levels of stress associated with school performance than females ( $M = 16.9$ ,  $SD = 7.0$ ),  $t(64) = 2.81$ ,  $p = .01$ .

### Item-Level Analysis

The aggregate subscale scores make psychometric and conceptual sense and have a well-established research history behind them, but to assist in developing a

preliminary understanding of the adolescent stress experience in a multi-ethnic Asian setting like Malaysia some exploratory analysis at the level of items was also undertaken.

There was a modal response of 5 (*very stressful*) for 1 of the 58 items: Concern about your future'. There was a modal response of 1 (*not at all stressful (or irrelevant to me)*) for 27 (47%) of the 58 items in the scale. Therefore, almost half of the items in the scale are not at all stressful or not in the lives of a notable number of respondents (from 10% to 60% of respondents, depending on the item).

There were no items with a modal response of 4 (*quite stressful*). There were 11 (19%) items with a modal response of 3 (*moderately stressful*). Six of these were school-related (teachers expecting too much from you; difficulty of some subjects; having to concentrate for too long during school hours; having to study things you are not interested in; too much homework; pressure of study).

The median scores ranged from 1 to 3 across the 58 items. There was a mean score > 3.0 for 4 (7%) of the 58 items.

### Gender Differences

A series of *t*-tests were conducted to examine gender differences in individual item scores. Given the exploratory nature of the study, no attempts were made to control for error rates associated with multiple testing. The seven (12%) items for which there were significant gender differences are presented in Table 3.



Table 3

Statistically Significant Gender Differences on the Adolescent Stress Questionnaire - Individual Item Scores

ASQ Item	Boys			Girls			<i>t</i> ( <i>p</i> )	Cohen's <i>d</i>
	<i>M</i>	<i>SD</i>	[95% CI]	<i>M</i>	<i>SD</i>	95% CI		
“Disagreements between you and your father”	2.3	1.2	[2.1, 2.5]	2.0	1.1	[1.8, 2.2]	2.05 (.04)	.25
“Little or no control over your life”	2.7	1.3	[2.5, 2.9]	2.4	1.4	[2.2, 2.6]	2.11 (.04)	.22
“Disagreements between you and your teachers”	2.6	1.3	[2.4, 2.8]	2.2	1.3	[2.0, 2.4]	2.94 (.00)	.31
“Going to School”	2.6	1.3	[2.4, 2.8]	2.3	1.3	[2.1, 2.5]	2.06 (.04)	.23
“Not enough time for boyfriend or girlfriend”	2.5	1.5	[2.3, 2.6]	2.2	1.4	[2.0, 2.4]	2.00 (.05)	.21
“Peers hassling you about the way you look”	2.2	1.5	[2.0, 2.4]	1.8	1.2	[1.6, 2.0]	2.90 (.00)	.29
“Disagreements between you and your mother”	2.8	1.4	[2.6, 3.0]	2.5	1.4	[2.2, 2.7]	2.05 (.04)	.21

Response scale: 1 (*not at all stressful (or irrelevant to me)*) to 5 (*very stressful*)

Boys scored significantly higher than girls on all of the seven items. For all seven items the effect sizes (Cohen's *d*) were considered 'small' (Table 3). Relationships with parents, teachers, and peers were featured prominently in these seven items.

**Ethnic Differences**

Analysis of variance indicated that there were significant ethnic differences on seven (12%) of the scale items. For all seven items the effect sizes (Partial Eta<sup>2</sup>) were considered 'small' (Table 4). The post-hoc analyses did not reveal any clear or

consistent pattern among the ethnic groups in terms of who was scoring highest for particular items.

*Table 4*

Statistically Significant Ethnic Differences on the Adolescent Stress Questionnaire - Individual Item Scores

	Malay			Chinese			Indian				
ASQ Item	<i>M</i>	<i>SD</i>	[95% CI]	<i>M</i>	<i>SD</i>	[95% CI]	<i>M</i>	<i>SD</i>	[95% CI]	<i>F</i>	<i>p</i>
“Concern about your future”	3.6	1.3	[3.3, 3.8]	3.1	1.2	[2.9, 3.3]	3.1	1.6	[2.7, 3.5]	4.18	.02
“Abiding by petty rules at home”	2.2	1.4	[1.9, 2.4]	2.0	1.2	[1.7, 2.2]	2.7	1.5	[2.3, 3.1]	6.80	.00
“Living at home”	2.1	1.4	[1.8, 2.3]	1.9	1.2	[1.6, 2.1]	2.6	1.6	[2.2, 3.0]	5.20	.01
“Lack of understanding by your parents”	2.7	1.3	[2.4, 2.9]	2.9	1.3	[2.6, 3.1]	2.3	1.2	[2.0, 2.5]	4.71	.01
Work interfering with school and social activities”	2.5	1.3	[2.1, 2.5]	2.3	1.2	[2.1, 2.5]	2.1	1.1	[1.8, 2.3]	3.36	.04
“Lack of respect from teachers”	2.4	1.3	[2.2, 2.6]	2.6	1.3	[2.4, 2.9]	1.9	1.1	[1.7, 2.2]	6.10	.00
“Getting along with your teachers”	1.7	1.2	[1.5, 2.0]	2.2	1.3	[2.0, 2.5]	2.6	1.7	[2.1, 3.0]	8.23	.00

Response scale: 1 (*not at all stressful (or irrelevant to me)*) to 5 (*very stressful*)

## Discussion

Adolescent stress has been extensively researched and a great deal is now known about the experience of stress and what that experience might mean psychologically for young people (Byrne et al., 2007). Much of this research has occurred with adolescents from Western cultures. The current study was a preliminary attempt to understand the patterns of adolescent stress in a multi-ethnic Malaysian sample. While the data derive from a small cross-sectional non-random convenience sample, the results suggest some useful possibilities for further research.

There is a need for ongoing research that considers appropriate strategies for the measurement of adolescent stress in multi-ethnic samples. The Depression Anxiety Stress Scales (DASS) seem to be widely utilised in the Asian context and generally show the expected relationships between stress and negative outcomes for adolescents. One Malaysian study noted that on the DASS-21 the majority of the sample reported no stress (57%) or mild stress (14%) (Ibrahim et al., 2014) and these results are similar to the findings reported here for the ASQ items in the current Malaysian sample.

The ASQ continues to be widely used internationally and is probably a 'gold standard' for measurement in this area. De Vriendt et al. (2009) suggest that the ASQ "...has the potential to be used in large scale epidemiological studies ... for the assessment of chronic stress in adolescents, and the investigation of the association with other health-related disorders" (p. 516). The current results raise some questions about how the ASQ might work in a Malaysian context. The item-level analysis provides a general global impression that the situations

assessed by the items on the ASQ, beyond school-related items, might not be particularly stressful or relevant for a substantial proportion of this Malaysian sample. In order to understand the nature of the responses to the individual items further research with the ASQ is needed, particularly when an item is rated as 1 (*not at all stressful or is irrelevant to me*). More detailed demographic information needs to be collected on the research sample in order to provide a context for interpreting some of the individual item ratings. For example, a number of items in the scale ask about ratings of parents/mother/father. If these items are rated '1' then that might reflect a non-stressful relationship with parents *or* it might mean that the item is irrelevant. So the one item can have different meanings for different respondents. The item could be irrelevant because the birth parent is deceased, no longer in the family, or the family home, the adolescent is being raised by a grandparent, another family member, or a non-family member. Similarly, ratings of relationships with a boyfriend or girlfriend might receive a rating of '1' because the relationship is not stressful and is going well *or* because the respondent simply doesn't have a boyfriend or girlfriend so the question is irrelevant to them.

Similar arguments apply to items about work and employers. An individual who gives a rating of '1' due to an item not being at all stressful is in different situation from an individual who gives an item a rating of '1' because they are not employed and it is therefore irrelevant to their current life circumstances. In order to aid clarity of interpretation perhaps those two meanings of a rating of '1' should be uncoupled in future research. Further research into the properties of the ASQ in the context of the Malaysian adolescent experience of stress is warranted. Whether the ASQ asks all the

right questions to tap into the adolescent stress experience in Malaysia remains an open question. Therefore, the failure to find consistent effects for gender and ethnicity may be due to either the absence of any such effects or the inability of the ASQ to detect those effects in a Malaysian sample.

Increasingly, there is an emphasis in the research literature on taking Western-validated measures of stress and considering them further in order to understand the extent to which they might be fit for purpose in the Asian context. For example, a study by Truc et al.(2015) suggested that the Educational Stress Scale for Adolescents shows some merit as a measure for studies of adolescent stress in Vietnam. Yusoff et al. (2013) report a study of the psychometric properties of the Medical Student Wellbeing Index in a sample of Malaysian medical students, while measures such as the Perceived Stress Scale have been modified and used among Malaysian medical students and shown to have adequate psychometric properties (Al-Dubaai et al., 2012). An insightful analysis of some of the measurement issues one must consider when working across different cultures is provided by Lee and Jung (2006). They describe three types of equivalence and bias that are important, and conclude by suggesting, “Thus, researchers always should question the philosophical and conceptual appropriateness of an assessment measure that has been conceptualized and operationalized in a culture that differs from the one in which it is to be used” (p. 1299).

At the subscale level, we found no significant gender differences in stress scores. This is contrary to the findings of Byrne and colleagues (2007) who noted gender differences on 7 of the 10 subscale scores, with females reporting significantly higher levels of stress than males. Our item-

level analysis showed significant gender differences for seven (12%) items but with males scoring significantly higher than females. Whilst there are many limitations to this item-based analysis it is instructive in terms of highlighting the possible Western/non-Western differences in the relationships between gender and adolescent stress. However, there are no necessary or inevitable gender differences in stress. For example, a recent study of Malaysian university students did not show the expected gender difference in either direction (Khodarahimi et al., 2012).

There were no significant ethnic differences in subscale scores. At the individual item level there were significant ethnic differences on seven (12%) of the items. There was no obvious or consistent pattern as to the types of items showing differences or the nature of the between groups differences (Table 4). Again, there are obvious limitations to these item-level analyses and it is unclear on the basis of the available data how research in this area of ethnic differences might best proceed. We identified a significant gender x ethnicity interaction for the ASQ subscale School Performance. As noted earlier, Indian males had significantly higher levels of stress than Indian females. Academic stress is one of the most-commonly reported difficulties in Indian adolescents (Singhal et al., 2014). Some studies with Indian samples report girls showing higher levels of academic stress than boys (Deb et al., 2014) while others report boys showing higher levels of stress than girls (Bista et al., 2016). These effects may be measure dependent and further research is needed.

Ethnicity should remain an important focus. There may well be conflict in schools for Malaysian adolescents that has racial undertones (e.g., Salleh & Zainal, 2014) and

more recently Seok et al. (2015) have suggested that, “The question of how successfully these diverse ethnic groups are incorporated into the fabric of life in Malaysia is obviously important for Malaysian society” (p. 4013).

The results from the current study serve as a reminder of important issues associated with the use of Western-developed assessment procedures in different cultural contexts. Ongoing research needs to focus on further development and refinement of strategies for measuring adolescent stress and understanding that experience in the Asian context. One culture’s conceptualisation of what constitutes stress may not necessarily or inevitably be the same as another’s.

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