ORIGINAL ARTICLE

Development of a validated instrument on socio-cultural and religious influences during menstruation in Malaysia

Keng Sheng Chew, PhD[1], Shirly Siew Ling Wong, PhD[2], Ahmad Khairi Hassan[1], Kian Ee Po[1], Norizzati Zulkhairi[1], Nurul Ammiera Lyieanna Yusman[1]

[1]Faculty of Medicine and Health Sciences, Universiti Malaysia Sarawak, Kota Samarahan, Kuching, Sarawak, Malaysia, [2]Faculty of Economics and Business, Universiti Malaysia Sarawak, Kota Samarahan, Kuching, Sarawak, Malaysia

ABSTRACT

Introduction: Although menstruation is a physiological process, it is shrouded with socio-cultural and religious beliefs. Healthcare providers should be aware that these influences may affect how women perceive their menstrual disorders. The primary objective of this study was to develop a validated questionnaire measuring the sociocultural and religious beliefs during menstruation.

Methods: In the first stage, a preliminary list of items measuring socio-cultural and religious beliefs during menstruation was generated. In the second stage, exploratory factor analysis was performed. Finally, confirmatory factor analysis using reflective measurement model and structural equation modelling was performed using partial least squares. The practices of these beliefs were included as mediating effect. Biological symptoms of menstruation were added in as another factor.

Results: A total of 400 female students from the Universiti Malaysia Sarawak, Malaysia were recruited. A preliminary list of 22 items was first generated. From the confirmatory factor analysis, two factors were iteratively removed due to poor factor loadings. Four factors were retained, i.e., i) "religious beliefs"; ii) "unpleasant (or dirty) nature of menstruation"; iii) "personal restrictions (dietary and behavior)"; and iv) "restrictions of interactions with male gender". In structural equation modelling, only 2 factors, i.e., the practices of "personal restrictions (dietary and behavioural)" and "restriction of interactions with males" had significant negative impact on quality of life.

Conclusion: Menstruation should not be viewed purely from a biological lens as there are layers of sociocultural and religious beliefs surrounding it.

KEYWORDS:
Menstruation, socio-cultural belief, religious belief, quality of life

INTRODUCTION

Although menstruation is a physiological process, it is often coated with layers of socio-cultural and religious beliefs.[1,2] Compounding this issue is the pervasive stigma in many cultures that women are discouraged to discuss menstruation matters openly.[3] This is because menstruation is often perceived as an "embarrassing" issue that should be kept hidden and private.[3] This kind of social shroud can be particularly "thick" in an Asian society like Malaysia.[2]

According to Young and Bacdayan (1965),[4] menstrual sociocultural beliefs can largely be categorised into the following categories: i) the general belief that menstrual fluid is unpleasant, contaminating or even "dangerous"; ii) menstruating women may not have sexual intercourse or engaging in sexual activities; iii) personal restrictions imposed upon a menstruating woman such as food taboos, restriction of movement, talking, etc.; iv) restrictions imposed upon contact with men and things that belong to men, e.g., personal articles, weapons in ancient times, craft tools, religious emblems and shrines (where men are considered the guardians of these religious emblems); v) a menstruating woman may not cook for men; and vi) a menstruating woman should be confined to a restricted space such as menstrual huts for the duration of their periods.

Many studies (including Asian studies) have been conducted on the impact of the physiology of menstruation on a woman's quality of life.[1,5-7] However, as alluded by Lu,[1] menstruation impact is a multi-dimensional construct. Other dimensions that have not been conspicuously described are the socio-cultural and religious dimensions. In this regard, it is imperative for healthcare providers to be aware of the impact of these influences which may affect how women perceive their menstrual disorders as well as their health seeking behaviour particularly with regards to the alleviation of menstrual symptoms. Furthermore, by knowing these influences, healthcare providers, can play a pivotal role in helping women to destigmatize and to develop a more positive attitude toward menstruation.[8]

The primary objective of this study was to develop and validate a questionnaire measuring the sociocultural and religious beliefs during menstruation. The secondary objective was to evaluate the influences of these sociocultural and religious beliefs and practices on female university students' quality of life.

MATERIALS AND METHODS

Participants

Female medical and economic students from Universiti Malaysia Sarawak (UNIMAS), Malaysia were recruited voluntarily for this study. Sample size was estimated using

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Corresponding Author: Keng Sheng Chew
Email: kschew@unimas.my

the population-based sampling method by Krejcie and Morgan.[9] Based on the total number of approximately 500 female medical students from Year 1 to Year 5 (with confidence interval of 95% and the margin of error 0.05), the estimated sample size for female medical students was 210. Based on the total number of approximately 400 female economic students from Year 1 to Year 3 (with 95% confidence interval and the margin of error 0.05), the estimated sample size for female economic students was approximately 190.

Materials

Exploratory factor analysis (EFA) was performed using Statistical Package for the Social Sciences (SPSS) statistical software with principal axis factoring as the extraction method. Partial least squares structural equation modelling (PLS-SEM) using the SMART-PLS software was performed to measure the impact of various sociocultural and religious factors as well as common biological symptoms on quality of life (QoL) during menstruation. The list of common biological symptoms during menstruation was adapted from a previous study by Wong and Khoo.[6] The validated Quality of Life Enjoyment and Satisfaction Questionnaire – Short Form (also known as Q-LES-Q-SF) by Endicott et al.[10] was adapted to measure quality of life. Q-LES-Q-SF had been similarly used before to measure the impact of menstrual pain[11] and the impact of pre-menstrual related disorders on quality of life. This instrument had also been shown to have good internal consistency and reliability.[12]

Procedures

Stage 1: Generation of preliminary list of items using Modified Delphi Technique

Adopting the classification by Young and Bacdayan4 described above as our conceptual framework, personal communications with female friends and family members were first conducted by authors KEP, AKH, NZ and NALY to identify common sociocultural and religious beliefs and practices during menstruation in our local communities. In addition, literature search was also conducted using keywords such as "menstruation", "menstruating", "menstrual", etc. to skim for information in academic journals, webpages, blogs, etc. From this initial search, a preliminary list of socio-cultural and religious beliefs during menstruation among the various ethnic groups in Malaysia were listed and categorized according to the categories described by Young and Bacdayan.[4]

Following that, opinions and suggestions were sought from several female lecturers in UNIMAS to validate and further refine our preliminary list using modified Delphi technique. Modified Delphi technique is a structured iterative process aimed to obtain consensus from individuals through a series of communication until agreement is reached.[13,14] The lecturers who participated in validation process consists of different ethnicities. They were asked to comment on the representativeness of the preliminary list factors to measure common sociocultural and religious beliefs during menstruation. Based on the inputs, the list was further refined and some additional items were also added. A cut-off point of 70% agreement was set as the minimum level for an item to be included in the edited list.[13]

Stage 2: Exploratory Factor Analysis (EFA)

A preliminary set of questionnaires was developed based on the list generated in Stage 1. In this stage, 100 female medical economic students were asked to rate their agreement for each item using a 5-point-Likert scale ("1 = strongly disagree" to "5 = strongly agree. For EFA, construct validity was determined using principal axis factoring as the extraction method using the SPSS software. An initial run of factor analysis was performed in order to determine the number of factors to be extracted. Factors with eigenvalues >1.0 would be retained.

Once the number of factors was determined, repeated runs of factor analysis were then performed to determine the factor loadings of the items as well as to identify problematic items that may need to be removed. Varimax rotation was used with a cut-off factor loading value of 0.4 as the criteria to determine whether an item was to be removed or not.[15] Pattern coefficient values of less than 0.5 were suppressed. The communality value, which indicates convergent validity of the items, was set at 0.25. Finally, the Cronbach's alpha coefficients were then checked to evaluate the degree of internal consistency of the items in each construct or factor. A cut-off point of Cronbach's alpha >0.6 was set as the criteria of a satisfactory degree of internal consistency.[16] The questionnaire was revised based on the EFA results.

Stage 3 Confirmatory Factor Analysis (CFA) and Structural Equation Modelling

CFA was then performed on the revised questionnaire. In this stage, another 300 females medical and economic students were asked to rate their agreement for each item using a 5-point-Likert scale, "1 = strongly disagree" to "5 = strongly agree". Reflective measurement model was performed using partial least square (PLS) method in SMART-PLS software. For internal consistency of the items, three parameters were analysed, i.e., i) Cronbach alpha; ii) composite reliability (CR) index; and iii) the rho A (ρA) coefficient (also known as Dijkstra Henseler's rho).[17,18] For convergent validity, the factor loadings of all items were obtained, as well as the Average Variance Extracted (AVE) values for each factor or construct. AVE refers to the grand mean value of the squared loadings of all items associated with a factor. AVE of >0.5 is generally acceptable for an item to be included even if its loading is between 0.4 and 0.7.[15] Factor loading of >0.7 was considered as acceptable, whereas factor loading of <0.4 was deleted. For factor loading with values between 0.4 and 0.7, the AVE would then be used to determine whether the item should be accepted. For discriminant validity, Fornell and Larcker criterion,[19] cross loadings of items as well as the Heterotrait-Monotrait ratio of correlations (HTMT) proposed by Henseler et al.[20] were obtained. All these measurements were generated from the SMART-PLS software.

Structural equation modelling was then performed to evaluate the influences of these various sociocultural and religious beliefs and practices on the students' quality of life. In this regard, the practices of these various beliefs were considered as the mediating effect on the quality of life (as measured using Q-LES-Q-SF). The reason to include practices of these beliefs as mediating effect is because beliefs without practices are unlikely to affect their quality of life.

Table I: Final version of the Factor Loadings and Cross-loadings of items of Socio-cultural and Religious Beliefs During Menstruation

	Religious	Interactions with male	Personal	Unpleasant
Religious				
Not allowed to enter holy places	0.938	0.214	0.092	0.247
Not allowed to read or cite holy book	0.859	0.274	0.038	0.237
Restrictions on the interactions with male				
Not allowing the male gender to touch used sanitary pad	0.196	0.449*	0.154	0.167
Not allowed to sit around and mingle with male	0.177	0.893	0.418	0.373
Not allowed to touch properties and belongings of the male gender	0.263	0.912	0.443	0.413
Personal Restriction				
Not allowed to eat cold food	-0.029	0.260	0.788	0.212
Not allowed to take iced water	-0.070	0.239	0.801	0.226
Not allowed to eat brinjal	0.203	0.466	0.736	0.459
Not allowed to eat papaya	0.211	0.477	0.706	0.498
Not allowed to eat pineapple	0.160	0.363	0.749	0.373
Not allowed to use any medications to relieve pain	0.133	0.425	0.625	0.361
Not allowed to wash hair and taking cold shower	-0.102	0.287	0.770	0.329
Unpleasant (or dirty) nature of menstruation				
Not allowed to step over plants	0.133	0.292	0.391	0.839
Not allowed to throw fallen hair into trash bin	0.311	0.443	0.400	0.848
Not allowed to throwing clipped fingernail into trash bin	0.297	0.404	0.358	0.813
Not allowed to touch flowers	0.216	0.309	0.370	0.860
Need to wrap used sanitary pad properly before disposing	0.023	0.188	0.229	0.463

Note: *Although the loading for this item was slightly low (0.449), but the AVE >0.5, indicating that the item was acceptable to be included (according to Hair et al. 2017 [15]).

Table II: Cronbach's Alpha, Composite Reliability (CR) and Average Variance Extracted (AVE) values of the Retained Four Factors in CFA

Belief Factors	Cronbach's Alpha	CR	AVE
Religious	0.772	0.894	0.809
Restrictions of interactions with male gender	0.661	0.813	0.610
Personal restrictions	0.864	0.895	0.550
Unpleasant nature of menstruation	0.826	0.882	0.608

Table III: Path Coefficients from Structural Equation Modelling

	Path coefficients	Standard deviation	T-statistics	P-values
Biological symptoms → QoL	-0.34	0.05	7.29	<0.001
Menstruation Practices → QoL	-0.17	0.05	3.67	<0.001
Religious beliefs → Menstruation Practices	0.00	0.03	0.15	0.88
Beliefs about restrictions of interactions with male gender → Menstruation Practices	0.12	0.04	3.00	<0.001
Beliefs of personal restrictions → Menstruation Practices	0.74	0.04	18.18	<0.001
Beliefs of the unpleasant nature of menstrual blood → Menstruation Practices	0.12	0.04	3.00	<0.001

Furthermore, not all beliefs is translated as practices. Besides that, we also included the impact of five common biological symptoms of menstruation (i.e., fatigue, abdominal pain/cramp, mood swing, headache, and irritability) [6] into consideration. These biological symptoms were measured on a 5-piont-Likert scale where 1=strongly disagree that this symptom is common for me, and 5=strongly agree that this symptom is common for me.

Institutional ethics approval was obtained prior to starting this research (reference no UNIMAS/NC-21.02/03-02 Jld.3(51)). All participants were assured that their data would be kept confidential, no personal identification data would be revealed. Participants were recruited voluntarily and they were informed that they could withdraw their participation at any time.

RESULTS

A total of 400 female students from UNIMAS were recruited, i.e., 228 medical students and 172 economic students. One hundred (i.e., 47 medical and 53 economic students) out of the 400 participants were recruited in the EFA stage. The remaining 300 participants were recruited for the CFA. The mean (Standard Deviation, SD) age of these 400 participants was 21.42 (±0.855) years old. With regards to their religious beliefs, 178 of them (44.5%) were Muslims, 106 participants (26.5%) were Christians, 78 (19.5%) were Buddhists, 33 (8.25%) were Hindus and five (1.25%) of other religious affiliations. Following sessions of discussion using the modified Delphi technique, a preliminary list of 22 items was generated for EFA. In the EFA stage, the Kaiser-Meyer-Olkin (KMO)21,22 measure of sampling adequacy was 0.744, which indicates that the sample was adequate for factor analysis. The p-value for Bartlett's test of sphericity was

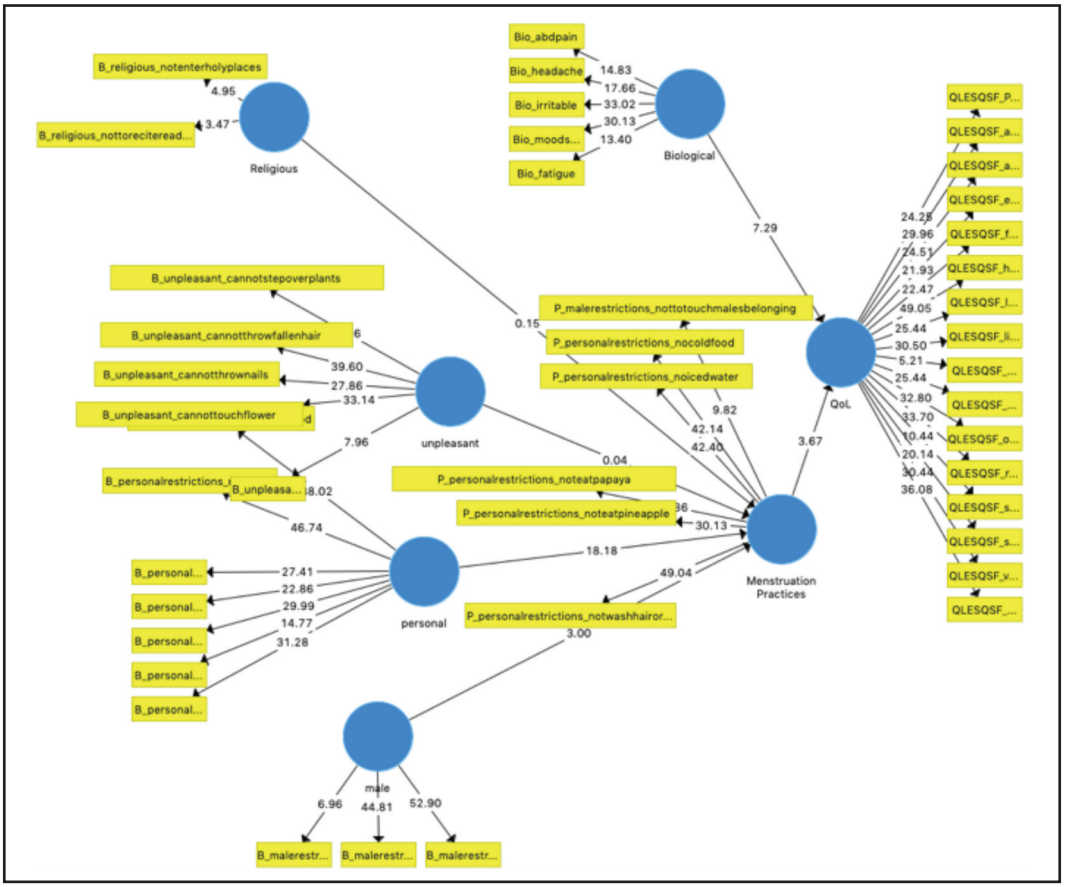

Fig. 1: Path model of sociocultural and religious beliefs and practices during menstruation among Malaysian university students.

<0.001, indicating that there are worthwhile correlations among the items. Based on initial eigenvalue>1, six factors were identified. With cut-off point of communalities value set at 0.25 to indicate good convergent validity of the items, re-runs of EFA subsequently performed showed that all items were loaded unto the various factors with good factor loadings of more than 0.5. No cross-loading was noted. Cronbach's alpha for these six factors (Factor 1 to 6) are 0.908, 0.898, 0.826, 0.855, 0.875 and 0.661 respectively. The inter-rater reliability measured using intra-class correlation coefficient (ICC) was 7.90 (95% Confidence Interval, 95%CI: 0.723, 0.848). Based on the items loaded unto them, Factor 1 was labelled as "Religious beliefs", Factor 2 as "Restriction on cooking and utensils", Factor 3 as "Unpleasant (or dirty) nature of menstruation", Factor 4 as "Personal restrictions (dietary and behaviour)", Factor 5 as "Spatial or movement restrictions" and Factor 6 as "Restrictions of interactions with male gender".

In the CFA stage, four items in Factor 2 "Restriction on cooking and utensils" and four items in Factor 5 "Spatial or movement restrictions" were iteratively removed due to poor factor loadings. Similarly, two items in Factor 1 "Religious beliefs", one item in Factor 3 "Unpleasant (or dirty) nature of menstruation" and three items in Factor 4 "Personal restrictions" were deleted due to low loadings. The factor loadings of all other items were acceptable and adequate. All factors achieved adequate convergent validity as the AVE was more than 0.5. The final result of the factor loadings is tabulated in Table I. The Cronbach alpha values, CR indices as well as the AVE values were satisfactory, indicating good convergent and divergent validity (Table II). The ρA of this study was 0.7, further suggesting good convergence and internal consistency.

In the structural equation modelling stage, the items in the four belief factors were subjected to the mediating effect of the practices of these beliefs. By bootstrapping the path coefficients, it was found that only two factors, i.e., "restriction of interactions with males" and "personal restrictions" are significant, t-statistics of 3.00 and 18.18 respectively. In particular, the path coefficient of factor "Restrictions of interactions with male gender" is weaker (0.12) compared to that of factor "Personal restrictions" (0.74). The path coefficients of both "menstruation practices" and "biological symptoms" in turn, had significant negative effects on the quality of life. Furthermore, biological symptoms were shown to have greater negative impact on the quality of life (path coefficient -0.34; t-statistics 7.29) compared to the practices of these sociocultural and religious beliefs (path coefficient -0.17; t-statistics 3.67) (Table III). The final path model for this study was shown in Figure 1.

DISCUSSION

Our study showed that sociocultural and religious beliefs during menstruation among university students can be broadly divided into four categories: i) religious restrictions;

ii) restrictions of social interactions with the male gender; iii) personal restrictions (with regards to dietary and behaviour); and iv) unpleasant (or dirty) nature of menstrual blood. A similar study on such restrictive behaviours during menstruation was similarly conducted in Fiji, Papua New Guinea and Solomon Islands.[23] In that study, the authors found that there were four overarching, but interacting themes. Three of out these four themes are very similar to the four categories of beliefs that we identified (with the exception of the category of religious beliefs which was not listed in that paper). The first theme is the belief that menstrual blood is 'dirty'. According to this belief, menstruating women are prevented from doing certain household tasks including food preparation, cooking and doing housework. This is similar to the category of the belief of the "unpleasant or dirty nature of menstrual blood" in our study. The second theme is the belief that menstrual blood and menstruating women can bring 'bad luck' to men and boys. According to this belief, menstruating women are prevented from, or should refrain from working in the garden, picking up fruits and avoiding contact with men and boys. This is similar to the belief of "restrictions of social interactions with the male gender" in our study although we classify the restriction to work in the garden under the category of the "unpleasant or dirty nature of menstrual blood" in our study. The third theme in that study is the belief of "shame and secrecy that surrounds menstruation". This refers to the need of secrecy in washing, cleaning and changing of sanitary pad and to ensure that the opposite gender do not see their menstrual blood. In our study, the need to wrap soiled sanitary pad and to dispose it properly is also an important belief although we classify this belief under the "unpleasant or dirty nature of menstrual blood" category. The fourth theme of belief addressed in that study by Mohamed et al.[23] is the belief of the impact of certain prohibitive behaviours on menstruation, health and well-being (similar to the category of "personal dietary and behavioural restrictions" in our study). In particular, this refers to certain restrictive beliefs to prevent heavy menstrual flow or menstrual cramps including the prohibition to drink iced or cold water, to eat sour things, or to wash hair using cold water|. Indeed, the similarities of these socio-cultural and religious beliefs is likely a reflection of the universality of some of these beliefs across the globe.

Nonetheless, although we have demonstrated the pervasiveness of some of these sociocultural and religious beliefs similar to the findings reported in some studies done outside of Malaysia,[23,24] we found that only the practices of "personal restrictions (dietary and behavioural)" and "restriction of interactions with males" had significant negative impact on their quality of life.

Interestingly, the practices of religious restrictions during menstruation do not seem to be significant. This might be due to the ethnic diversity of our sampled population, reflecting the varying degree of compliance to these restrictions. For the majority Muslim participants, they are restrained from performing religious rituals[25] including the restriction to enter mosque as well as the prohibition to pray or fast during the Ramadan fasting month.[26] The second largest religious group among our participants were the Christians. For the Christians community, generally they do not have restrictions during menstruation except for those from some Orthodox churches where menstruating women are prohibited to partake communion.[27] Among the Hindus, menstruating women are forbidden from entering "pooja room" (the prayer area in a house) and the temple.[28] Among Buddhists, menstruating women are restricted from performing certain religious rituals and ceremonies in temples as well as meditation.[29] Menstruation is also believed to make a woman loses her 'qi' (or inner energy).[29]

LIMITATIONS

Our study has a number of limitations. First, this study was conducted in only one centre in Malaysia, i.e., UNIMAS in the state of Sarawak. The demographic characteristics as well as the socio-cultural beliefs in Sarawak may not be generalizable to the demographic characteristics in other parts of Malaysia. Should this study be repeated in other parts of Malaysia where the percentage of Muslims may be higher, the impact of religious beliefs may be more significant. Secondly, because the initial stage of this study (Stage 1) involved getting opinions from friends and family members of some of the co-authors of this study, this might have introduced implicit, personal biases to the questionnaire development, e.g., soliciting answers just to conform to our personal beliefs. Thirdly, this study was only conducted among young university students. The perceptions, compliance and the impacts of these beliefs on quality of life may be different among those from the older age groups. For example, a study done by Lawlor and Choi30 showed that younger women generally have a more positive attitudes towards menstruation as they perceived menstruation as a natural physiological process rather than a process shrouded with taboos and myths. Fourthly, this study was solely conducted from a quantitative perspective. To better capture the emotions, concerns and fears surrounding these sociocultural and religious beliefs during menstruation, an added qualitative dimension may add more richness and colour to our findings.

CONCLUSIONS

In conclusion, menstruation should not be viewed purely from a biological lens. Instead, it should be viewed from a biopsychosocial lens due to the fact that there are layers of sociocultural and religious beliefs surrounding it. Four categories of sociocultural and religious beliefs have been identified in this study but only the practices of "personal restrictions (dietary and behavioural)" and "restriction of interactions with males" had significant negative impact on quality of life.

ETHICAL APPROVAL

Institutional ethics approval was obtained prior to starting this research (reference no UNIMAS/NC-21.02/03-02 Jld.3(51)). Participant's information sheet was given and written consent was obtained from participants prior to their participation. All participants were assured that their data would be kept confidential, no personal identification data such as name, personal identity number, etc. would be

revealed and their data would only be used anonymously solely for the purpose of this research. Participants were recruited voluntarily, and they were informed that they could withdraw their participation at any time.

Permissions were also obtained from the participants to publish their data anonymously without revealing their names and identities.

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