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Original Article

Designing and Psychometric Analysis of a Married Women's Work–Family Conflict Questionnaire

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ABSTRACT

Background: The available instruments for work–family conflict measurement are not specific to women. **Objective:** The current study was conducted to design and psychometrically evaluate a married women's work–family conflict questionnaire (MWWFCQ). **Methods:** This study consisted of two phases. The first phase was item generation and questionnaire design. In this phase, a qualitative approach was used to develop items. Seventeen in-depth individual interviews and two group discussions were carried out and available texts and questionnaires were reviewed to generate the items. The second phase was item reduction and psychometric evaluation of the formulated questionnaire including, face, content, and construct validity and reliability assessment. For the assessment of construct validity, a cross-sectional study was performed. Participants included 400 employed married women with different jobs living in Bushehr Province that were recruited through cluster sampling. **Results:** In the first step, 108 items were generated. After assessing face and content validity, 39 items were remained. In the exploratory factor analysis, two items were removed. This analysis revealed a four-factor structure for the scale that altogether explained 45.87% of the total variance. Cronbach's alpha was 0.926 for the total scale. The interclass correlation coefficient between the test and retest was 0.983. **Conclusion:** The 37-item MWWFCQ is a questionnaire with acceptable reliability and validity and can be used in studies on married women.

KEYWORDS: *Family relationship, Questionnaire design, Working women*

INTRODUCTION

Work–family conflict (WFC) is the sense of having insufficient time and energy for successfully performing both work and family roles.[1] It is often considered to affect women more than men.[2] A meta-analysis has shown that WFC leads to negative consequences such as lower well-being, family and marital dissatisfaction, lower mental health scores, substance abuse, depression, health problems, stress, anxiety, intention to turnover, absenteeism, and burnout.[3]

The growing trend of women's participation in the workforce and higher prevalence of WFC among women having a valid instrument seems to be necessary for measuring the amount and nature of WFC among women. WFC causes a number of problems that have the potential to impair various aspects of health. Thus, it is important for health-care providers such as nurse, midwife, and community health nurse to evaluate the effect of the work–family interference on women.[4] Using a valid instrument for measuring WFC is important for this evaluation.

In initial instruments on WFC, bidirectional (work interference with family and family interference with work) or multidimensional nature of WFC was

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not considered. These questionnaires only assessed work interference with family, such as "wanting to be a "good" spouse versus being unwilling to risk taking the time from your work" in Holahan and Gilbert's scale.[5] Bidirectionality of the WFC is important because as work interfere with family, family obligations can also interfere with work. Some WFC assessment tools such as questionnaires developed by Netemeyer *et al*.[6] and Carlson *et al*.[7] considered the bidirectionality of WFC, but these questionnaires considered the source of conflict rather than its consequences. The questionnaire designed by Rastgar Khaled is based on the previous questionnaires designed in Western countries.[8] Psychometric evaluation of this questionnaire is limited to exploratory factor analysis and internal consistency. In exploratory factor analysis, some items with a factor loading <0.3 were maintained.[8] The important point is that none of the above-mentioned questionnaires was designed specifically for married women.

The available questionnaires are often designed based on Western culture while studies have shown that the experience and understanding of women about the concept of WFC in any society can be different from those of other societies.[9] Attitude of the society toward being a woman or man, as well as social norms such as religion, gender roles, and priority of working outside for women can also affect the interaction between work and family.[10]

Objective

The present study is conducted to design and psychometrically evaluate a context-based married women's work–family conflict questionnaire (MWWFCQ).

METHODS

This study consisted of two phases including item generation and questionnaire design; and item reduction and psychometric evaluation of the formulated questionnaire.

First phase: Item generation

Two methods were used to develop MWWFCQ items. A conventional qualitative content analysis was designed. Seventeen semi-structured in-depth individual interviews and 2 group discussions were carried out to explore the experiences of married women with different jobs about the WFC concept. Two main questions included: "How does your work affect your family life?" and "How does your life affect your work?" Participants in the qualitative phase were employed married women living in different parts of Bushehr Province, Iran. In each group discussion, 6 employed married women were recruited through purposeful and maximum variation sampling (i.e., regarding: Age, job experience,

number of children, and geographical location). Sample selection and interview sessions were continued until data saturation.[11] Timeframe of individual interviews varied between 30 and 70 min. Duration of two focus group discussions was 100 and 110 min. Collection and analysis of data were performed in 2014. All the interviews were recorded and then, transcribed verbatim as soon as possible to reveal a clear model from thoughts, behaviors, ideas, and experiences of the participants. Nonverbal messages of the participants such as tone, silence, emphasis, crying, and sigh were also noted in the text. The whole interview transcript was considered an analysis unit. Before coding, the whole text was read repeatedly so that the researcher would completely get familiar with the data, achieve immersion, and obtain a sense of the whole. Afterward, meaning units were identified and coded. The meaning units were words, sentences, or parts of the text in each analysis unit that were coded. The codes were first put in subcategories according to their similarities; then, depending on the relationships between subcategories, the large numbers of subcategories were organized into a smaller number of categories.[12] The codes and quotations of the participants were used to design the questionnaire items. In the next step, available texts and instrument in the WFC area were reviewed and the items pool was completed.

Second phase: Item reduction and psychometric evaluation

Item selection and assessment of face validity

The designed items were evaluated by 6 experts in the field of WFC (including sociologists, psychologists, and industrial and organizational psychologists) and 3 experts in the field of instrument development. Some of the overlapping items were eliminated. Some items were also changed, and the wording of the items was edited for simplification. After these changes, the questionnaire was prepared with 52 closed items to start the psychometric evaluation.

For qualitative face validity, 20 employed married women with different education levels were asked to express their understanding about items of MWWFCQ. They were also asked about the level of difficulty, fitness, and ambiguity of items. Items were edited according to the recommendations of this group. Furthermore, two experts in the field of Persian literature and 10 experts (in the domains of WFC and instrument development) were asked to comment about wording and grammar of items.[13]

The quantitative face validity was assessed by measuring the impact of items. In this step, 10 employed married women were asked to evaluate the items in terms of

importance on a scale of 1–5. Impact scores of the items were measured using formula: percentage of participants who give each item scores as 4 or 5× mean of importance score for each item. An impact score ≥1.5 was considered appropriate.[14]

Assessment of content validity

In the qualitative method, 10 experts (in the areas of WFC and instrument development) were asked to present their opinions about putting the items in their proper place, matching the items with relevant content domains, adequacy of items for relevant dimensions, and appropriate scoring.[13] The questionnaire was then edited according to their recommendations. Quantitative content validity was calculated by measuring the content validity ratio (CVR) and modified Kappa statistic., 10 experts in the field of WFC were asked to rate the necessity of each item on a 3-point scale (1-Item is not essential, 2-Useful but not essential, and 3-Item is essential). Items whose necessity was determined by less than 9 experts were removed or revised.[15]

To determine modified Kappa statistic, content validity index for item (I-CVI) was first calculated. Ten experts in WFC were asked to score the relevance rate of each item. (i.e., 1 - Irrelevant, 2 - Somehow relevant, 3 - Acceptably relevant, and 4 - Completely relevant). I-CVI was calculated by dividing the number of experts who give each item scores 3 or 4 by the total number of experts participating in the panel. Then, modified Kappa statistic was calculated using the following formula:

$$K° = \frac{I-CVI-Pc}{1-Pc}. Pc = \left[\frac{N!}{A!(N-A)!}\right] \times 0.5^N$$

In this formula, N is the number of evaluators, and A is the number of agreements in terms of relevance. I-CVI is the I-CVI and P_c is the probability of chance agreement.

Furthermore, average of the CVIs for all the items on the scale was calculated as content validity index of the overall scale (S-CVI/average).

Modified Kappa statistic of higher than 0.75, between 0.60 and 0.749, between 0.40 and 0.599 and <0.40 is considered excellent, good, fair, and poor, respectively.[16] S-CVI/average 0.9 or higher is considered acceptable.[17]

Assessment of construct validity

Before the assessment of construct validity, a pilot study was carried out on 30 employed married women with different educational levels to identify possible problems with the questionnaire and calculate initial internal consistency. In this step, Cronbach's alpha was calculated as 0.896.

For the assessment of construct validity, a cross-sectional study was performed in 2015. Participants included 400 employed married women with different jobs living in Bushehr Province. The sample size was equal to the number of items multiplied by 10.[18] Since 39 items were left at the end of the previous step of psychometric evaluation, the sample size was estimated as 390 subjects. Considering the possibility of sample loss, 420 questionnaires were distributed, 400 of which were returned. The sampling method was clustering. Among the cities of Bushehr Province, 4 cities were randomly selected from different parts of the province. Samples were selected from private and governmental job centers of these 4 cities. The inclusion criteria were being married and living with husband, husband's employment, and Iranian nationality.

For item analysis, the correlation among items, and the correlation between each item and the overall score of MWWFCQ was evaluated. An item was deleted if it had a correlation coefficient of 0.3 or less with at least one other item or with the overall score of MWWFCQ.[18] In addition, if the correlation coefficient between the two items was >0.7, one of the items was deleted.[19]

Exploratory factor analysis was performed with equamax rotation. KOM was calculated for the sufficiency of the sample size. Bartlett's test of sphericity was conducted for the fitness of factor analysis model. Determinant score was calculated to examine multicollinearity. As a rule of thumb, a determinant score greater than 0.00001 indicates the absence of multicollinearity.[20] Parallel analysis method was used for determining the number of factors to retain. To perform parallel analysis, first, the eigenvalues of real data were calculated. Then, using SPSS Syntax and entering the command to create random data from real data, the eigenvalues of random data were calculated. Random data extraction and eigenvalues calculation were repeated 50 times, and then, the mean and 95th percentiles of eigenvalues of 50 random data extractions were calculated for each factor. In the final step, the eigenvalues of random data were compared with the eigenvalues of real data and only those factors were extracted whose eigenvalue from real data was greater than the mean and 95th percentile of eigenvalue from random data.[21] In addition, the scree test was performed.

For the evaluation of discriminant validity, the correlation among factors from the exploratory factor analysis was assessed.

To test the hypothesis, as another method of construct validity, these three hypotheses were tested: 1-There is a direct correlation between the amount of working hours

per week and WFC scores among employed women. 2-There is a significantly negative correlation between WFC and marital satisfaction. 3-There is a statistically significant and positive relationship between WFC and occupational burnout.

Working hours were calculated by the question: "how many hours a week do you spend on work?" Participants' marital satisfaction was measured through the Enrich marital satisfaction questionnaire which consists of 35 items. The questions on the Enrich questionnaire have five options (strongly disagree to strongly agree) which are scored on a Likert scale.[22] For assessing the occupational burnout, the Maslach Burnout Inventory was used which consists of 35 items.[23] All the items are scored on a 7-point frequency rating scale ranging from 0 (never) to 6 (daily). The reliability of the two mentioned questionnaires was measured by a pilot study on 30 employed married women living in Bushehr Province and Cronbach's alpha scores of 0.928 and 0.808 were obtained for the Enrich marital satisfaction and Maslach Burnout Inventory, respectively. The questionnaires were filled out by 400 participants who also completed MWWFCQ. SPSS V. 13 (SPSS Inc., Chicago, IL, USA) was used for data analysis.

Assessment of floor or ceiling effects

Floor or ceiling effects were considered to be present if >15% of respondents achieved the lowest or highest possible score, respectively.

Assessment of reliability

To determine the internal consistency, Cronbach's alpha was calculated for the total questionnaire and its dimensions. Cronbach's alpha >0.7 was considered a satisfactory internal consistency.[24] Stability evaluation of MWWFCQ was conducted using test-retest method.[13] MWWFCQ was completed twice with a 2-week interval by 30 employed married women. Then, the interclass correlation coefficient (ICC) was measured. ICC of 0.7 or greater between two tests represents a satisfactory stability.[24]

Additional statistical analyses

Kolmogorov–Smirnov test was performed to check data normality. Descriptive and analytical statistics of exploratory factor analysis, Pearson's correlation, and reliability tests (Cronbach's alpha and ICC) were used for data analysis.

Ethical considerations

The study's protocol was approved by the Ethical Committee of Tehran University of Medical Sciences (ethical approval code: IR.TUMS.REC.1395.2619). Participation was completely voluntary. The purpose of the study was explained to all the participants, and they were assured that their personal information would remain confidential. In the qualitative phase, all transcriptions remained anonymous. The participants were assured that all tapes would be destroyed after the research process was completed. The questionnaires distributed in the quantitative phase were anonymous. The participants signed written informed consent letters for participation in the research.

RESULTS

Item generation

After the qualitative analysis of the individual interviews and two group discussions, 105 items were obtained using the quotations of the participants. Three items were added through literature review and eventually, the pool of items was formed with 108 items.

Item selection and face validity

After eliminating overlapping items and changing the written format of the items according to the ideas of experts in the fields of WFC and instrument development, the questionnaire was prepared with 52 closed items to start the psychometric evaluation.

Regarding qualitative face validity, the wording of three items was changed according to the opinion of the research team and again evaluated by 5 persons of the studied target group. Moreover, all the items had impact scores of >1.5 (i.e., from 1.8 to 5).

Content validity

Regarding qualitative content validity, 3 more items were removed and MWWFCQ was prepared with 49 items to determine the CVR.

For the CVR, 10 items were determined as necessary by 7 or <7 WFC experts and were then removed. All the remaining 39 items had acceptable modified Kappa coefficients, i.e., from 0.79 to 1). S-CVI/average was 0.948 which indicated the content validity of the overall scale.

Ultimately, the questionnaire was prepared with 39 items to assess construct validity. All items were scored on a 5-point Likert scale from "Strongly disagree" to "Strongly agree," except for items 3, 4, 5, and 7 that were scored in reverse.

Construct validity

The prepared questionnaire (Appendix 1) was used for construct validity. In reporting the results of this part, instead of mentioning the phrasing of the items, the number of items was used. In item analysis, all the items had a correlation coefficient of 0.3 or greater with at least one item and with the overall MWWFCQ. In addition, no two items had a

correlation coefficient >0.7; therefore, no item was removed.

Exploratory factor analysis was conducted with equamax rotation on the 39 items of the questionnaire. KOM was 0.896, which indicated the sufficiency of the sample for factor analysis. Bartlett's test showed a significant relationship between the items (Chi-square = 5276.832, $P < 0.001$), denoting the appropriateness of the factor analysis model. The determinant score was 0.009 which indicated the absence of multicollinearity.

Comparison of real data eigenvalues and the mean as well as 95th percentile of random data eigenvalues showed that the 4-factor structure was appropriate for the questionnaire (ie., eigenvalue from real data was greater than the mean and 95th percentile of eigenvalue from random data). In addition, scree plot is shown in Figure 1. Four factors altogether explained 45.87% of the total variance. After the equamax rotation, the factors 1–4 explained 16.3%, 12.04%, 11.54%, and 5.98% of the variance, respectively. Minimum load factor to maintain the item was considered 0.35. Items 6 and 37 had a load factor of <0.35 and were thus removed. The four factors of the questionnaire along with the items and factor loads of each item are shown in Table 1. The factors were named according to the content of the items. The first (17 items), second (7 items), third (8 items), and fourth (5 items) factors were named "interference of work role in individual and family life," "disagreement and dissatisfaction of family," "interference of family role in work role," and "inadequate support or facilities," respectively [Table 2].

Correlations of the four factors are found in Table 3; none of the correlations were above 0.70. Thus, discriminant validity was confirmed.

Pearson's correlation showed a statistically significant and direct correlation between working hours per week and WFC measured by MWWFCQ ($r = 0.4$; $P = 0.001$). There was a negative and significant correlation between WFC and marital satisfaction ($r = -0.494$; $P < 0.001$). In addition, there was a positive and statistically significant correlation between WFC and occupational burnout ($r = 0.585$; $P < 0.001$).

Floor or ceiling effects

Less than 15% of the respondents achieved the lowest or highest possible scores in the 4 factors and the total scale showing no floor or ceiling effects are present.
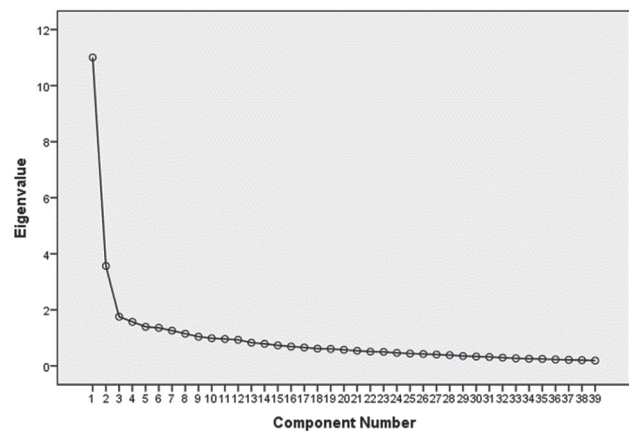

Figure 1: Scree plot

Table 1: The four-factor structure of the married women's work-family conflict questionnaire							
Factor 1		Factor 2		Factor 3		Factor 4	
Number of items	Factor loading	Number of item	Factor loading	Number of item	Factor loading	Number of item	Factor loading
24	0.693	1	0.654	34	0.763	4	0.775
25	0.672	9	0.623	33	0.750	3	0.746
13	0.651	26	0.501	35	0.724	8	0.475
16	0.640	28	0.487	36	0.710	7	0.454
23	0.635	29	0.473	32	0.653	5	0.433
11	0.607	27	0.463	38	0.580		
19	0.567	2	0.438	31	0.565		
10	0.564			39	0.522		
17	0.559						
15	0.554						
14	0.546						
20	0.517						
12	0.515						
18	0.508						
21	0.473						
30	0.475						
22	0.470						

MWWFCQ: Married women's work-family conflict questionnaire

Table 2: Eigenvalues of real and random data

Factors	Real data's eigenvalue	Mean of random data's eigenvalue	95th percentile of random data's eigenvalue	Retained factors
1	11.003	1.645	1.713	Accepted
2	3.564	1.570	1.613	Accepted
3	1.754	1.515	1.574	Accepted
4	1.569	1.463	1.496	Accepted
5	1.395	1.421	1.456	Rejected
6	1.358	1.386	1.419	Rejected
7	1.259	1.350	1.377	Rejected
8	1.147	1.310	1.343	Rejected
9	1.041	1.277	1.313	Rejected

Table 3: Discriminant validity of the four dimensions of married women's work-family conflict questionnaire

Dimensions of MWWFCQ	1	2	3	4
1 - Interference of work role in individual and family life	-			
2 - Disagreement and dissatisfaction of family	0.699	-		
3 - Interference of family role in work role	0.398	0.541	-	
4 - Inadequate support or facilities	0.405	0.289	0.117	-

MWWFCQ: Married women's work-family conflict questionnaire

Reliability

Cronbach's alpha was 0.919, 0.786, 0.841, 0.75, and 0.926 for factors 1, 2, 3, 4, and the total scale, respectively. Moreover, ICC between the test and retest was 0.979, 0.924, 0.913, 0.935, and 0.983 for factors 1, 2, 3, 4, and the total scale, respectively ($P < 0.001$ in all cases).

DISCUSSION

The current study was conducted to design and psychometrically evaluate MWWFCQ. The final format of this questionnaire had 37 items with four dimensions, which included the interference of work role in individual and family life, disagreement and dissatisfaction of family, interference of family role in work role, and lack of support or facilities. Results showed that the questionnaire had acceptable validity and reliability.

MWWFCQ considers the conflict between family and work. The items in this questionnaire emphasize the consequences of WFC instead of directly mentioning the strain or time factor as the origin of conflict.[7]

Although the first dimension of MWWFCQ, i.e., conflict of work role with individual and family life, had more items than the dimension of WFC in other WFC questionnaires, this increase led to considering both work-in-family and work-in-individual life interference among employed married woman. Most of the previous WFC questionnaires, such as the questionnaires developed by Carlson *et al*.[7] and Netmeyer *et al*.,[6] have only addressed the conflict between work and family duties. Burley (1989, as cited in Herst) measures WFC by using an 8-item two-way questionnaire, and investigates work-individual life conflict using 4 items; but the questionnaire does not address its consequences.[5] In the present questionnaire, an employed woman is considered a member of the family and the addition of work role to her family role could affect her welfare.

The second dimension of MWWFCQ measures family dissatisfaction and disagreement. This dimension has not been considered in the existing questionnaires and has a high correlation with total MWWFCQ. Most of the items in this dimension have been originated from sociocultural background of the research population. For example, disagreement of husband with his wife's occupation or her working conditions as well as his interference in spending his wife's income is culturally rooted.[25] Women's occupation is not prohibited in Islam; but, husband's consent is a necessity in this regard. Dissatisfaction of family members with lack of sufficient attention or consideration has been presented in few questionnaires on WFC.[5] In the present questionnaire, dissatisfaction of family members along with disagreements represented the reaction of family members and formed a dimension altogether.

The third dimension represents conflict of family life and work duties, which again mentions the consequences instead of addressing the origin of conflict. This dimension has 8 items, which are higher in number than the items dedicated to this dimension in the existing questionnaires. It is assumed that evaluating consequences can measure the conflict more objectively.

The fourth dimension of the questionnaire includes some of the most important predictors of WFC. In many studies, work and family supports predict WFC; however, they have not been included as a dimension in the available questionnaires. Since many predictors of WFC such as number and age of children, working hours per week, and number of family members are shown in the demographic part of most questionnaires, the existence of a domain which contains predictors such as family support, working support, and social facilities can present a more comprehensive questionnaire.

Internal consistency of the total MWWFCQ was higher than those of most of the previous questionnaires such as the questionnaires developed by Curbow *et al*.,[26] Netmeyer *et al*.,[6] and Carlson *et al*.,[7] and the

reliability of its dimensions was acceptable. However, in this article, higher reliability was not mentioned as the strength of the questionnaire because reliability is a function of the increased number of items, and MWWFCQ has more items than the available questionnaires.

CONCLUSION

Finally, MWWFCQ is a questionnaire with acceptable reliability and validity that can be used for married women in Iran. This questionnaire emphasizes the impact of conflict on individual, family, and working roles of employed women, instead of the origin of conflict, i.e., pressure, time, or behavior. Two dimensions of disagreement and dissatisfaction of family along with the dimension of inadequate support and facilities can help more comprehensive study of WFC among employed married women. In MWWFCQ can be used by health-care providers to evaluate the effect of WFC on women's health.

One of the strengths of the present study was development of the questionnaire based on experiences of the target group. Other strength was precise implementation of the steps for face and content validity. Furthermore, unlike most studies which use one organization or occupation for work-family instrument validation, the sample of the present study represented a large variety of occupations.

One of the limitations of the study in both the qualitative and construct validity parts was that the participants were employed married women living with their husbands. Therefore, this instrument is not applicable to divorced or single women.

Since developing, validating, and evolving a new instrument are lengthy and continuing processes, many other endeavors are still needed to further develop and purify the instrument. The authors hope to overcome the potential shortages of the questionnaire in future studies. It is recommended that further studies perform confirmatory factor analysis and also determine responsiveness of this new instrument.

Finally, only two constructs (marital satisfaction and burnout) were used to assess the differential relationships of the WFC questionnaire. Future studies are needed to examine the relation between additional constructs and different dimensions of WFC.

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Conflicts of interest

There are no conflicts of interest.

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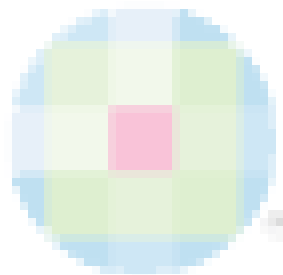
APPENDIX

Appendix 1: Items of married women's work-family conflict questionnaire before investigating construct validity

A. Please specify your agreement with the following sentences

1. My husband disagrees with my working conditions (working hours, shifts, working environment, etc.)
2. My husband does not allow me to spend my income as I like
3. I can count on the help of people around me to coordinate my job and family
4. I can count on the help of my colleagues to coordinate my job and family
5. Working rules and regulations are in such a way that I can easily handle my work and family duties
6. I cannot adjust my time to take care of my job and family
7. I can change my working hours or shifts to take care of my family affairs
8. I do not have enough income to be able to receive help for my family responsibilities (child care or house chores)
9. My husband totally disagrees with my occupation

B. Which of the following options have you experienced because of the concurrency of job and family duties?

10. I feel fatigued and exhausted
11. I do not pay enough attention to my nutrition
12. I am sleep deprived
13. My desire for sexual activity is decreased
14. I am scared of having a baby/increasing the number of my children
15. I suffer from physical problems (digestive, bone, etc.)
16. I do not have enough vitality
17. I do not have an opportunity for my favorite activities (recreation, sports, arts, etc.)
18. I regret that I am employed

Contd...

Appendix 1: Contd...

19. I feel guilty since I do not perform my family responsibilities properly because of having a job
20. I feel guilty since I do not perform my work duties properly because of my family responsibilities
21. When I am working, I am worried about my family
22. I am worried that my work may endanger my marriage

C. With which of the following options are you faced because of your occupation?

23. I devote a small amount of time for my family
24. I do not have any time to socialize with my relatives and friends
25. I cannot take good care of my parents and my husband's parents
26. Family members are always complaining about my absence
27. My husband is dissatisfied with my performance in marital relationship
28. My family express inconvenience since I do not perform house chores properly
29. Family members do not like that I bring my work to home
30. Due to my occupational necessities, I have to change the plans associated with my family activities

D. Which of the following cases have you experienced in your job because of your family duties?

31. I get to work with delay or leave the work earlier
32. I do not have enough progress in my job
33. I do not have the required performance in my job
34. I do not have the required concentration in my job
35. I do not have a good relationship or behavior with my colleagues
36. I do not have a good relationship or behavior with my clients
37. I do not have enough time for working overtime
38. I take care of family affairs during working hours
39. My colleagues complain that I entrust my work tasks to them