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Japanese version of the Quality of Relationship Inventory: Its reliability and validity among women with recurrent spontaneous abortion

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Abstract Until now most of the research on social support has concentrated on general support in relationship to the whole group of people around each individual. In contrast, only a few studies have dealt with individual-specific support (i.e. social support from a particular individual relationship). The Quality of Relationship Inventory (QRI) is a recently developed questionnaire to measure individual-specific social support. We developed the Japanese version by means of back translation and ascertained its reliability and validity among the Japanese women who had had two recurrent spontaneous abortions without known organic etiologies. Factor analysis revealed that the Japanese QRI had a two-factor structure, representing supportive and conflictual aspects of a particular relationship (named Factor-S and Factor-C, respectively). Each factor showed satisfactory reliability with Cronbach's alphas of 0.95 and 0.89. When the QRI scores were compared with the scales from the Social Support Questionnaire, a measure of general social support, the Factor-C of the former with respect to the mother correlated negatively with the Social Support Satisfaction of the latter ($r = -0.40$; 95% confidence interval (CI) −0.64 to −0.09). Childhood experiences with parents also showed expected correlations with the QRI: care received from the parent before age 16 years strongly predicted Factor-S with that parent ($r = 0.50$, 95% CI 0.21–0.71 in the case of the mother; $r = 0.54$, 95% CI 0.27–0.73 in the case of the father). Although we still need to examine the Japanese QRI with different populations, it appears to be a promising measure of individual-specific relationship for the Japanese population.

Key words construct validity, cultural differences, factor validity, Japanese culture, Quality of Relationship Inventory, reliability, social support.

INTRODUCTION

Among psychosocial factors affecting individual mental health, social support is one of the most important and best studied and research on social support has become more and more active in recent years.[1–3] However, most of these investigations have concentrated on general support (general perceived support) in relation to the whole group of people around each individual. Only a few studies have dealt with social support from particular individual relations (individual-specific perceptions).

The perceived social support from particular individuals cannot be considered as a mere element composing general support. Pierce *et al.* introduced the Quality of Relationships Inventory (QRI)[4] as an individual-specific social support questionnaire in 1991. Some psychometric properties of the original

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QRI have already been reported: test–retest reliability and internal consistency reliability are both satisfactory;[5] and factor validity, concurrent validity with other social support questionnaires[4,6,7] and external validity (QRI scales of college students and their mothers assessing the quality of their relationship with one another predicted observers' global judgments of their behavior as they discussed a current source of conflict in their relationship[5]) have been confirmed.

The QRI has not yet been introduced into Japan. With the permission of the original authors, we translated the QRI into Japanese and administered it to a consecutive series of couples attending the special clinic for recurrent spontaneous aborters in our university hospital. The present paper reports the reliability, factor validity and construct validity of the Japanese QRI.

METHODS

Translation of the QRI

The QRI is a questionnaire consisting of 25 items, which asks about specific relationships with a particular individual. Factor analysis of the original QRI showed that 25 items of QRI composed of three factors, which are the social support (Social Support: seven items), the depth of the relation (Depth: six items) and conflict (Conflict: 12 items).[4] The Social Support scale assesses the perceived availability of social support from the specific relationship. The Depth scale assesses the extent to which a relationship is perceived as positive and important. The Conflict scale assesses the extent to which the relationships are conflictual or ambivalent.

Each item is assessed on a Likert-style rating of four levels (1 point, do not correspond at all; 2 points, do not correspond so much; 3 points, correspond a little; 4 points, correspond very much).

We followed the back-translation procedure in order to ascertain the semantic equivalence of the Japanese version with the original.[8,9] The preliminary Japanese translation was back-translated into English by an independent pair, one of whom was a native English speaker. IG Sarason (Department of Psychology, University of Washington, Seattle, USA) compared the back-translated version with the original and pointed out any discrepancies. We repeated this cycle until final agreement was reached.

Subjects

A team of obstetricians and psychiatrists at Nagoya City University Hospital has been conducting a cohort study of 40 couples who had had no children and had had two recurrent spontaneous abortions without known organic etiologies, using structured interviews and questionnaires, since April 1995.[10,11] The purpose and procedure of this investigation were explained to each couple and written agreement to participate was obtained.

The test battery contained the Japanese version of the QRI. Each wife was asked about her individual relationships with her spouse, parents and parents-in-law, which resulted, all-in-all, in 187 usable samples. The mean (±SD) age of the subjects was 30.1±3.4 years (range 22–39 years).

Procedure

First we calculated Measuring Sampling Adequacy (MSA) in order to ensure the validity of factor analysis with the present dataset.[12] Next, principal component factor analysis with Promax rotation was conducted. We used the Scree plot to determine the number of factors to be extracted because it has been shown to be the most reliable across various datasets.[13,14] The reliability based on item–total correlation was evaluated for each factor. In addition, reliability based on the internal consistency was estimated with Cronbach's alpha coefficients.[15]

The construct validity of QRI was verified by examining its correlation with two questionnaires tapping interpersonal relationships: the Parental Bonding Instrument (PBI),[16] which measures parental rearing practices before age 16 years, and the Social Support Questionnaire (SSQ),[17] which measures the number and perceived adequacy of the social support received from the environment. Both were administered at the same time as the QRI.

The PBI consists of 25 items that evaluate the nursing experiences received from a parent before age 16 years along two dimensions of Care and Overprotection. The reliability and validity of the Japanese version of the PBI have already been verified.[16,18]

The SSQ evaluates aspects of general social support in terms of the expected number of persons providing support (SSN: social support number) and the subject's perceived satisfaction with it (SSS: social support satisfaction).[17] Some investigators have reported a negative correlation between the stress load and SSS.[19] The SSQ has been translated into Japanese and validated with Japanese samples.[20]

We used SPSS 10.0 for Windows (SPSS, Chicago, IL, USA) for statistical evaluations.

RESULTS

Factor analysis

The value of MSA (0.922) suggests that factor analysis is appropriate for the present dataset. Therefore, we performed principal component factors analysis with Promax oblique rotation in accordance with the original paper.

Figure 1 shows the Scree plot. It can be seen that the values beginning with the third factor have flattened, suggesting that the number of factors to be extracted would be two. Therefore, the following two factors have been obtained (Table 1). One factor corresponds with the 'Social support' factor and the 'Depth' factor of the original edition, including one item of 'Conflict' factor (no. 10: 'How much more do you give than you get from this relationship?') and the other corresponds with the 'Conflict' factor, except for no. 10 of the original edition. The two factors explained 57.9% of the total variance, the first factor accounting for 36.3% and the second for 21.5%. We have termed these new factors as 'Factor-S' and 'Factor-C', respectively, in this paper.

Reliability of each factor

Item–total correlation

Table 2 shows the item–total correlations of each factor. These are correlation coefficients between the total score of the measure and each item that composes the measure. The item–total correlation coefficients of the Factor-S were in the range from 0.47 to 0.85 (average 0.75) and those of the Factor-C were in range from 0.42 to 0.79 (average 0.62). They all indicate a positive correlation of intermediate to high degree.

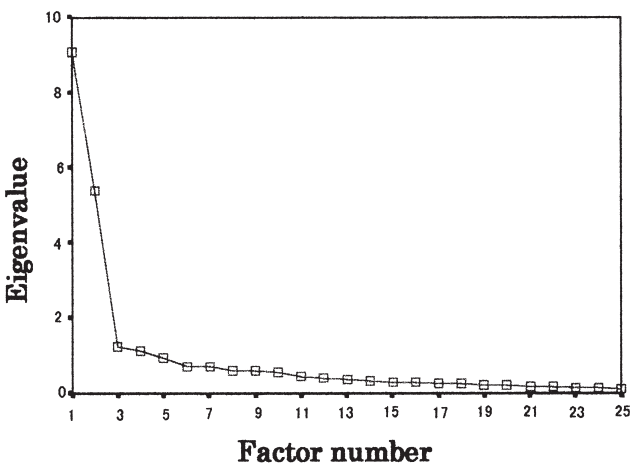

Figure 1. Scree plot.

Examination of internal consistency

Cronbach's alpha coefficient was 0.95 for Factor-S and 0.89 for Factor-C.

Validity of each factor

Concurrent validity: QRI and SSQ

Table 3 shows the correlation coefficients between the two subscales of the SSQ (SSN and SSS) and those of the QRI. The SSN showed statistically significant moderate positive correlation with Factor-C with the mother-in-law and SSS showed significant negative correlation with Factor-C with the mother. The correlations with other items were not statistically significant.

Construct validity: QRI and PBI

Table 4 shows the correlation coefficients between the two subscales of the PBI (Care and Overprotection)

Table 1. Factor analysis

Item	Factor-S	Factor-C
QRI 1	0.871	
QRI 3	0.849	
QRI 5	0.637	
QRI 8	0.813	
QRI 10	0.511	
QRI 11	0.875	
QRI 12	0.873	
QRI 13	0.797	
QRI 14	0.855	
QRI 16	0.716	
QRI 17	0.670	
QRI 18	0.825	
QRI 19	0.830	
QRI 23	0.820	
QRI 2		0.725
QRI 4		0.764
QRI 6		0.670
QRI 9		0.490
QRI 15		0.753
QRI 20		0.680
QRI 21		0.823
QRI 22		0.590
QRI 24		0.854
QRI 25		0.632

Loadings less than 0.3 are suppressed.

QRI, Quality of Relationship Inventory; Factor-S, Factor-C, supportive and conflictual aspects of a particular relationship, respectively.

Table 2. Item–total correlation coefficients

Factor	Item	*r* (Spearman)	95% CI
Factor-S	QRI 1	0.842	0.794–0.879
	QRI 3	0.816	0.761–0.859
	QRI 5	0.595	0.494–0.681
	QRI 8	0.775	0.711–0.827
	QRI 10	0.469	0.348–0.573
	QRI 11	0.852	0.807–0.887
	QRI 12	0.848	0.802–0.884
	QRI 13	0.763	0.696–0.817
	QRI 14	0.822	0.769–0.863
	QRI 16	0.669	0.582–0.742
	QRI 17	0.626	0.530–0.706
	QRI 18	0.796	0.736–0.843
	QRI 19	0.792	0.732–0.840
	QRI 23	0.782	0.719–0.832
Factor-C	QRI 2	0.656	0.566–0.731
	QRI 4	0.691	0.608–0.760
	QRI 6	0.594	0.492–0.679
	QRI 7	0.564	0.457–0.654
	QRI 9	0.420	0.294–0.532
	QRI 15	0.690	0.606–0.758
	QRI 20	0.583	0.480–0.671
	QRI 21	0.751	0.681–0.808
	QRI 22	0.492	0.375–0.594
	QRI 24	0.788	0.727–0.837
	QRI 25	0.557	0.449–0.649

QRI, Quality of Relationship Inventory; Factor-S, Factor-C, supportive and conflictual aspects of a particular relationship, respectively; CI, confidence interval.

Table 3. Construct validity: Social Support Questionnaire and Quality of Relationship Inventory

	Social Support Questionnaire	
	SSN	SSS
Quality of Relationship Inventory		
Spouse's		
Factor-S	0.11	0.06
Factor-C	−0.29	−0.25
Mother's		
Factor-S	0.04	0.26
Factor-C	−0.08	−0.40* (−0.64, −0.09)
Father's		
Factor-S	0.08	0.14
Factor-C	−0.07	−0.28
Mother-in-law's		
Factor-S	0.00	0.19
Factor-C	0.37* (0.05, 0.62)	−0.09
Father-in-law's		
Factor-S	0.07	−0.10
Factor-C	0.19	−0.16

*$P < 0.05$. Values in parentheses are the 95% confidence intervals.

Factor-S, Factor-C, supportive and conflictual aspects of a particular relationship, respectively; SSN, social support number; SSS, social support satisfaction.

and the QRI. Maternal Care in the PBI showed a significant positive correlation with the mother's Factor-S and significant negative correlation with the mother's Factor-C of the QRI. Maternal 'Overprotection' in the PBI showed a moderate positive correlation with the mother's Factor-C in the QRI. Moreover, paternal 'Care' in the PBI showed intermediate positive correlation with both the father's and mother's Factor-S in the QRI.

DISCUSSION

The original authors proposed a three-factor structure for the QRI. However, in the present Japanese sample, factor analysis indicated that the Social Support factor, the Depth factor and one item of the Conflict factor (no. 10) in the original version can be integrated into one factor.[21,22]

It is possible that this difference of in factor structure reflects some cultural differences. When Sarason *et al.* examined the QRI in the US, 'relation in which an available social support can be expected ('Support' factor)' was independent of 'relation to be thought as positive and important ('Depth' factor)'. In other words, people in the US can expect 'Support' regardless of the 'Depth' of the relationship. Such a relationship is typified in volunteer works, which are popular in American societies and may be traced to the Christian background. In contrast, the two kinds of relationships were indistinguishable in Japan. That is, the relationship in which one may expect the support is almost always a positive, important relationship in Japan. This result corresponds well with the traditional Japanese culture in which 'the person on whom one can depend and from whom one can expect concrete support is an important person'. This cultural spirit is exemplified by Japanese proverbs such as 'Stranger in the neighborhood than a relative far away' and 'Roll in the long one'.

However, it must be noted that Pierce *et al.*[4] originally reported a high correlation coefficient between 'Social support' and 'Depth' ($r = 0.61$). This may indicate that it was difficult to distinguish the two factors, even in the original QRI.

In fact, Cronbach's alpha coefficients of the Japanese QRI were 0.95 for Factor-S and 0.89 for

Table 4. Construct validity: Quality of Relationship Inventory and Parental Bonding Instrument

	Parental Bonding Instrument			
	Maternal		Paternal	
	Care	Overprotection	Care	Overprotection
Quality of Relationship Inventory				
Mother's				
Factor-S	0.50* (0.21, 0.71)	−0.10	0.37* (0.06, 0.62)	0.17
Factor-C	−0.42* (−0.66, −0.12)	0.43* (0.12, 0.66)	−0.22	0.28
Father's				
Factor-S	0.23	−0.17	0.54* (0.27, 0.73)	−0.19
Factor-C	−0.07	0.28	−0.13	0.21

*$P < 0.05$. Values in parentheses are the 95% confidence intervals.
Factor-S, Factor-C, supportive and conflictual aspects of a particular relationship, respectively.

Factor-C. It is generally assumed that alphas greater than 0.7 (if possible, greater than 0.8) indicate good internal consistency reliability.[23] In the item–total analysis, a significant positive correlation was shown between each item and the corresponding factor. Therefore, we can conclude that the Japanese version of the QRI has good reliability.

We have also been able to demonstrate reasonable construct validity for the QRI with regard to both the SSQ and PBI. Past investigations have shown that there is a negative correlation between social stress and SSS of the SSQ.[17] That is, the higher the SSS, the stronger the resistance to the stressors. In the present sample, a negative correlation was found between 'Conflict (Factor-C)' with the mother as measured by the QRI and SSS of the SSQ. The subjects in the present sample were women aged approximately 30 years, who had experienced two consecutive spontaneous abortions but who want a child and will likely become mothers in the near future. It is then very understandable that the relationship with the mother occupies an especially important position for them psychologically and materially in daily life. A woman who has less conflict with her mother tends to be satisfied with the system of the social support in the environment.

It is of note that 'Support (Factor-S)' or 'Conflict (Factor-C)' measured by the QRI reflect the current relationship with the parents, whereas 'Care' and 'Overprotection' measured by the PBI are assessments of past relationships with parents because subjects are asked about the relationship that they had experienced up to the age of 16 years. Our present findings can be interpreted as suggesting that a good parent–child relationship, as seen in the PBI, leads to better 'Support', as assessed by the QRI, and that 'Overprotection' of the PBI and 'Conflict' of the QRI represent a vicious spiral relationship between parent and child.[24]

The present analyses of the Japanese version of the QRI lead to a factor structure different from the original version. However, it was not completely contradictory with the original structure because two factors of the original version were merged into one in the Japanese version. If further studies with different samples in different parts of Japan lead to a two-factor structure as in the present study and similarly high reliability and validity coefficients, it can be concluded that the difference of the factor structure mainly depends on cultural backgrounds. After these processes, the Japanese QRI can then be considered a useful questionnaire measuring individual-specific social support from the two aspects of 'Support' and 'Conflict' in Japan.

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