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What is This?
Reliability (Internal Consistency) of the Job Content Questionnaire on Job Stress Among Office Workers of a Multinational Company in Kuala Lumpur

Husna Maizura, MBBS, MPH, Retneswari Masilamani, MBBS, MMed, and Tahir Aris, MD, MPH

This small, cross-sectional study assessed the reliability of 3 scales from the Job Content Questionnaire (JCQ)—decision latitude, psychological job demand, and social support—in a group of office workers in a multinational company in Kuala Lumpur. A universal sample of 30 white-collar workers from a department of the company self-administered the English version of the JCQ comprising 21 core items selected from the full recommended version of 49 items on-site. Reliability (internal consistency) was evaluated using Cronbach’s $\alpha$ coefficients for each scale. Corrected item–total correlation was presented for each and every item. Cronbach’s $\alpha$ coefficients were acceptable for decision latitude (.76) and social support (.79) but slightly lower for psychological job demand (.64). Values for all item–total correlations for all 3 scales were greater than .3. In conclusion, this study suggests that the JCQ is a reliable scale for assessing job stress in this group of workers.

Keywords: Cronbach’s $\alpha$; internal consistency; Job Content Questionnaire; office workers; reliability

Job stress has become an increasingly important occupational health problem, affecting all categories of workers, irrespective of workplace and country. One of the popular job stress models is the demand-control job strain model, which posits that high job strain occurs when jobs with high demands (workload) are combined with low control (decision authority and skill discretion). In contrast, jobs with low demand and high control would be viewed as “low strain,” jobs with high demand and high control as “active,” and jobs with low demand and low control as “passive.”
The instrument designed to assess the psychosocial work environment based on the job strain model is the widely used Job Content Questionnaire (JCQ). The JCQ has become one of the most widely used workplace environment questionnaire to assess job stress in many occupational settings in the world. Three JCQ job characteristics scales were used in this study: psychological job demands, job decision latitude, and workplace social support. Job demands refer to psychological demands, such as the mental workload, organizational constraints on task completion, or conflicting demands. In contrast, job control, or decision latitude, of the worker relates to the freedom permitted to the worker in deciding how to meet the demands or how to perform tasks. Later, a third dimension, worksite social support, was added, which is believed to act as a mediator of work stress.

In Malaysia, both the English and Malay versions of the JCQ have been used in studies by researchers from Hospital Universiti Sains Malaysia (HUSM) in Kelantan, involving nurses and clerical workers, medical professionals, laboratory technicians, automotive manufacturing workers, and secondary school teachers. Even though the researchers have reported reliability of the Malay JCQ, there is no report on the reliability of the English JCQ in Malaysia. A company in Kuala Lumpur providing professional services to a global multinational organization was keen to conduct a survey on job stress as a part of risk assessment on psychosocial hazards among its office workers. The purpose of this study was to assess the reliability of the JCQ's main constructs in this group of office workers, as there could be concerns as to whether the model is applicable to this group. This short study was also part of a small pilot study to evaluate the questionnaire and other procedures prior to the actual survey.

Methods

The study design was a cross-sectional study conducted in one of the departments of the company. Ethical approval to conduct the study was obtained from the Medical Ethics Committee of the University Malaya Medical Centre. The principal author also signed a cooperation and confidential agreement with the management of the company to ensure confidentiality of the data collected. The study subjects included a universal sample of 30 office workers among white-collar job groups ranging from clerical staff to executives and professionals from a department of the company who gave written informed consent before participating in the study.

This department was chosen because the office workers here were of similar background status when compared with the other members of the study population that will be included in the actual survey. The authors and the management reviewed the JCQ items on clarity of wording and relevance. Being employees of a multinational company routinely dealing with international clients and proficient in the English language, the English version of the JCQ and consent form were distributed to the workers at the department with a covering letter ensuring confidentiality. The workers were given approximately 30 minutes to self-administer the questionnaires. The returned questionnaires were checked for completeness on-site. The response rate was 100%.

Questionnaire

Twenty-one items of the JCQ were selected from the full recommended version of 49 items. These items constituted a set of questions for 3 major scales of the JCQ, that is, decision latitude (8 items; or job control with 2 subscales—skill discretion and decision authority), psychological job demands (7 items), and workplace social support (6 items; the sum of 2 subscales—coworker support and supervisor support). Items in the scales were recorded using a Likert-type scale, ranging from 1 (strongly disagree) to 4 (strongly agree).
For each of the scales of decision latitude, psychological job demands, and worksite social support, a sum of weighted item scores was used as a scale score, calculated using Karasek’s recommended format. Information on age, gender, ethnic group, marital status, education level, and work history (duration of present job, total duration of working life, and working hours per week) was also obtained from the participants.

Statistical Analysis

Data entry and analysis was done using the Statistical Package for Social Sciences (SPSS), version 11.0. For the sociodemographic variables, tests of normality were done for continuous variables to choose the appropriate measure of central tendency. As a result, means and standard deviations were calculated for normally distributed continuous variables whereas medians and interquartile ranges were calculated for skewed variables. The frequencies and percentages were reported for categorical variables. Pearson’s (interitem) correlations, item–total correlations, and Cronbach’s $\alpha$ coefficients were examined to determine internal consistency of the items. Reversed items for item–total correlations were rereversed to make the items positive in the same direction. The $P$ value was set at .05, and the results were interpreted according to the recommendations proposed by Garson\textsuperscript{11} and Santos.\textsuperscript{12}

Results

The sociodemographic characteristics of the study subjects are shown in Table 1. The mean age of the workers and total duration of working life of the workers are 28.3 years and 4.8 years, respectively. The median duration of present job and working hours per week are 10 months and 42.5 hours, respectively. Most of the respondents are female (57%), single (63%), and have a degree (80%). The ethnic breakdown of workers in the department is Indian (37%), Malay (33%), Chinese (23%), and other ethnic groups (7%).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean (SD)</th>
<th>Median (IQR)</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>28.3 (3.2)</td>
<td>10.0 (12.9)*</td>
<td></td>
</tr>
<tr>
<td>Duration of present job (months)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total duration of working life (years)</td>
<td>4.8 (3.2)</td>
<td>42.5 (9.0)*</td>
<td></td>
</tr>
<tr>
<td>Working hours per week</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>13 (43)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>17 (57)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ethnic group</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Malay</td>
<td>10 (33)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chinese</td>
<td>7 (23)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Indian</td>
<td>11 (37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td>2 (7)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marital status</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single</td>
<td>19 (63)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married</td>
<td>11 (37)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diploma</td>
<td>6 (20)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Degree</td>
<td>24 (80)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NOTES: SD = standard deviation; IQR = interquartile range.

*The distribution is skewed to the right.
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The item–total correlations and Cronbach’s α coefficients for all 21 items of the JCQ scales are given in Table 2. In general, Cronbach’s α coefficients were adequate for decision latitude (.76) and worksite social support (.79) and acceptable for psychological job demand (.64).11 Cronbach’s α reflected the internal consistencies of the item–total correlations for the respective scales. Values for almost all item–total correlations for all 3 scales were greater than .3, indicating that each of the scale items had good correlation with the other items comprising the overall scale score.11 By following the minimum recommended level of .30,11 only 2 values—Q8 (little decision freedom) in the decision latitude scale and Q32 (wait on others) in the psychological job demand scale—showed low Pearson correlations with the other items in their respective subscales. Dropping these items did not change the level substantially. Table 3 shows that dropping item Q8 improved Cronbach’s α to .80 (instead of .76), but dropping item Q32 decreased Cronbach’s α to .63 (instead of .64).

### Discussion

One of the ways to estimate reliability when the true instrument is not available is by using internal consistency with Cronbach’s α as the coefficient of reliability.11 The α coefficient ranges in value from 0 to 1; the higher the α value the more reliable the generated scale is.12 An α value of .70 or higher is considered as adequate or acceptable, but it is common to
have a lenient cutoff of .60 in exploratory research.\textsuperscript{11,12} The present study is an attempt to measure the reliability of selected scales of the JCQ in office workers of a multinational company in Kuala Lumpur. Generally, in this study, the selected scales—decision latitude, psychological job demands, and workplace social support—showed acceptable and satisfactory internal consistencies. Cronbach’s α coefficients for the 3 scales were acceptable, with the lowest in the psychological job demands scale (.64). In addition, except for 2 items that showed borderline correlation, the interitem correlations were high, indicating that the items were measuring the same underlying construct. As dropping the 2 items did not change the α value substantially, the authors can decide later to include or exclude the items in the analysis of the actual study.

Various studies have also reported values for scale reliability using a variety of scale items. However, most studies reported Cronbach’s α involving actual study subjects using large sample sizes. As shown in some other studies, Cronbach’s α for the psychological job demand scale in this study is somewhat lower than the decision latitude scale. In a cross-national study of the JCQ scales in 6 broadly representative populations in the United States, Canada, Netherlands, and Japan, Cronbach’s α ranged from .68 to .86 for decision latitude and from .51 to .72 for psychological job demands.\textsuperscript{9} The social support scales were reported by their subscales (8 items), ranging from .68 to .84.

A study on workers from a large teaching hospital in Canada reported Cronbach’s α to be .81 for the decision latitude scale, which consisted of 9 items, and .70 for psychological job demands, which consisted of 5 items.\textsuperscript{2} The analyses of the reliability were based on data from actual survey subjects involving 484 health care workers who self-administered the questionnaire twice, in 1995 and 1997.

In another study, researchers used the JCQ on 114 women in a small American Midwestern university town.\textsuperscript{13} The authors found Cronbach’s α to be .67 for psychological demands (9 items), .81 for decision latitude (9 items), and .85 for social support (11 items). In this study, there was also selection bias because the subjects self-referred themselves for the study in response to advertisements that called for healthy, working women to undergo a study on blood pressure and social experiences.

\begin{table}
\centering
\caption{Revised Cronbach’s α Coefficients for 7-Item Decision Latitude and 6-Item Psychological Job Demand Scales}
\begin{tabular}{llcc}
\hline
Scale & Item & Corrected Item–Total Correlation\textsuperscript{a} & Cronbach’s α \\
\hline
Decision latitude & & & \\
Q3 & Learn new thing & .62 & .80 \\
Q5 & Requires creativity & .45 & \\
Q6 & Allows own decisions & .50 & \\
Q7 & High skill level & .79 & \\
Q9 & Variety & .65 & \\
Q10 & Lots of say & .78 & \\
Q11 & Develop own abilities & .63 & \\
Psychological job demands & & & \\
Q19 & Work fast & .54 & .63 \\
Q20 & Work hard & .65 & \\
Q26 & Conflicting demands & .65 & \\
Q27 & Intense concentration & .46 & \\
Q28 & Task interrupted & .76 & \\
Q29 & Hectic job & .75 & \\
\hline
\end{tabular}
\textsuperscript{aAll correlations are significant at the .05 level (2-tailed).}
\end{table}
The JCQ was also used as a standard to be compared with by researchers who developed the Work History Questionnaire derived from it. In contrast to the study in Midwestern America, the authors asked 283 employed men to complete the JCQ (plus other questionnaires). Cronbach’s α for the 5-item psychological job demand scale was .74 and .83 for the 9-item job decision latitude scale. For the workplace social support scale, the authors reported the internal consistency reliability as .87 for supervisor support and .70 for coworker support.

Limitations

A major limitation of the study was that the subjects were from a varied category of workers, and the sample size was quite small. As the sample size was small, it was not possible to conduct a separate analysis by different categories of office workers as well as by gender. The analyses of different groups could have provided different reliability. Furthermore, selection bias is possible as subjects were taken from a particular department of the whole company. On the other hand, by identifying only 1 department, it would be easier for the investigators to exclude the workers from this particular department from being potential subjects for the actual study later.

Conclusion

In conclusion, this small study demonstrated that the 3 scales of the standardized English version of the JCQ is a reliable tool for assessing the psychosocial work condition in this group of office workers. However, the current study offers only preliminary findings. Perhaps a larger sample size consisting of a random sample of subjects from various categories of workers and departments from the company would yield better results.

Acknowledgments

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