Cross-Cultural Adaptation of the Work Role Functioning Questionnaire to Korean

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Cross-Cultural Adaptation of the Work Role Functioning Questionnaire to Korean

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ABSTRACT

Cross-Cultural Adaptation of the Work Role Functioning
Questionnaire to Korea

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Objective: Work Role Functioning Questionnaire(WRFQ) is widely used in measuring outcomes of work rehabilitation interventions and in evaluating return to work programs for workers with physical impairments. The objectives of this study are to translate, and to conduct the cross-cultural adaptation of the WRFQ to Korean and to assess its usability in Korean health care service field.

Methods: Translation was carried out according to systematized standards for the cultural adaptation of instruments used in the occupational health field: (1)forward translation, (2)synthesis, (3)backward translation, (4)consolidation of translations by a committee of experts. And then, it was administered to fifty volunteer workers of both sexes, with physical(musculoskeletal) and/or mental(anxiety and/or depression) health problems with a minimum duration of 4 weeks. They were

recruited when they visited an in-company clinic with the purpose of medical check up. Investigation of musculoskeletal and mental disorders was also performed at the same time. NIOSH symptom criteria for musculoskeletal disorders(Korean version, KOSHACODE H-30-2003) and CES-D(Center for Epidemiological Studies- Depression Scale), BAI(Beck Anxiety Inventory) were used. To evaluate the internal consistency, the Cronbach's alpha coefficient was calculated for each subscale of the questionnaires. The repeatability or stability of the instrument was assessed through test-retest reliability with a sufficient gap of time(at least 2 weeks). Finally, construct validity was evaluated comparing the median values of the subscale scores between physical and mental disorder groups.

Result: The study sample was composed of 36 men and 14 women, with a mean age of 32.5 years. Workers in their twenties were the highest(46.0%) and majority of job type was manual(80.0%). The Cronbach's alpha coefficient was 0.92 in the total scale, above 0.70 in all subscales. The Intraclass Correlation Coefficients(ICC) for the test-retest reliability were ranged between 0.83(95% CI: 0.72-0.90, Physical demands) and 0.94(95% CI: 0.89-0.94, Flexibility demands). The ICC for the total score was 0.90(95% CI: 0.83-0.94). Construct validity was considered proper. The difference of physical demands scores between the two groups(low and high) were statistically significant($p<0.05$). On the other hand, the state of mental disorders strongly influences on overall subscales except physical demands.

Conclusion: The cross-cultural adaptation of the WRFQ was successful without major problems. The Korean version of the WRFQ(WRFQ-K) demonstrated

excellent acceptability and psychometric properties. This study also proved its usefulness in terms of validity and reliability. We believe that our study can help researchers and clinicians to measure outcomes of work rehabilitation interventions and to evaluate return to work programs for workers with impairment.

I. INTRODUCTION

Work impairment which means work-related limitations due to health problems is one of the most serious social issues with high prevalence rates and medical expenditure in the United States(Brault MW et al., 2005). Not only about prevalence but also costs, workers with persistent impairments had a significantly higher incidence of medical expenditure compared with workers without the impairments(Junxin Shi et al., 2015).

In order to maintain worker's productivity and overall health, occupational health services should meet the needs of the workers with impairment and improve the functional capacity. Therefore, the adaptation of work conditions to a worker's ability has become a very significant matter in work rehabilitation and management programs in modern society(Macdonald EB et al., 2010).

With advancing rehabilitation services, many instruments for measuring effectiveness of return to work programs have been proposed. However, there are a number of challenges in assessing their outcomes(such as disability duration, lost time from work, the impact of health on role functioning). Most of these instruments have failed to take all the necessary factors into consideration because they focused on isolated measurements. Furthermore, the major concern of these instruments was mainly focused on the absence of works. They did not care about the remained ability. Therefore, they cannot give proper information on the level of participation nor describe how well a worker can perform their job(Amick BC 3rd et al., 2000).

Instruments are required to evaluate all the factors involved together, supplying accurate information on the health status of the workers prior to return to work. The 'Work Role Functioning Questionnaire(WRFQ)' was developed on the basis of the 'Work Limitations Questionnaire(WLQ)' and 'Work Limitations-26 Items' which were widely used to measure the perceived difficulties in meeting work demands among employees given their physical health or emotional problems during the work activities. Additionally WRFQ can be used to determine the effects of the intervention(Amick BC 3rd et al., 2000). Even though the questionnaire is only used in compensation field and musculoskeletal disorders at this point in time, it could be a useful tool in many other fields by expanding its domain of application(Lerner D et al., 2002).

Instruments need to be systematically translated, and adapted for its users from different cultures owing to potential cultural and social differences. Therefore, the proper cross-cultural adaptation process of the questionnaires which consists of six steps was introduced(Beaton DE et al., 2000). The WRFQ has been successfully translated and adapted to be used in different cultural contexts(Durand MJ 2004, Gallasch CH 2007, Abma F 2012, Ramada JM 2013). These versions have shown good psychometric properties in different populations. But, there has not been developed Korean version of WRFQ so far. The objectives of this study are to translate, and make the cross-cultural adaptation of the WRFQ for Korean spoken in Korea, preserving its psychometric properties as much as possible and to assess its usability in Korean health care service field.

II. METHODS

1. Scoring of WRFQ

We used the Scoring instruction for WRFQ 2.0, which was updated in 2013. The WRFQ is a self-administered questionnaire containing 27 items grouped into 4 subscales(5 subscales in previous versions): Work scheduling & output demands(WSOD), Physical demands (PD), Mental & social demands(MSD), Flexibility demands(FD). Next to the scores on the subscales, a total score can be calculated.

The 27 items are answered as a percentage of time difficulties they experience when performing job demands with 0=difficult all the time(100%), 1=difficult most of the time, 2=difficult half of the time(50%), 3=difficult some of the time, 4=difficult none of the time(0%). There is a response option 'Does not apply to my job'. The scores on 'Does not apply to my job' are transformed to missing values. The WRFQ 2.0 is scored on a scale from 0(a lot of difficulties/poor work functioning) to 100(no difficulties/good work functioning).

A total score is calculated by summing up all the answers, divided by the number of completed items(mostly 27, can be lower due to missing values). This is multiplied with 25 to obtain percentages between 0 and 100%, with higher scores indicating better work functioning. If more than 20%(6 items) are missing, no score can be calculated and the score is set to missing. In the case the WRFQ is used in daily practice, results should be discussed if there are more than 15% scores rated as 'not applicable to my job'.

Subscale scores are summed up separately by adding the answers in the subscale, divided by the number of completed items in the subscale. This is multiplied with 25 to obtain percentages between 0 and 100, with higher scores indicating better work functioning. If more than 20% or more items are missing, no score can be calculated and the score is set to missing.

2. The Cross-Cultural Adaptation Process

The important principles that translators should follow are to maintain equivalence between the original instrument and its translated version, and to preserve its psychometric properties as much as possible. To adhere to these rules, translation was carried out according to a systematic and standardized procedure consisting of five steps: (1)forward translation, (2)synthesis, (3)backward translation, (4)consolidation of translations by a committee of experts and (5)pre-test, which is based on a review of cross-cultural adaptation by different research groups(Beaton et al., 2000).

Forward translation
- 4 translators (2 informed, 2 uninformed)
- Direct translation into Korean

Synthesis
- 2 translators and 1 expert committee members
- Resolve discrepancies with forward translator's report

Backward translation
- 2 oversea Koreans without any related information
- Done after 4 weeks

Consolidation
- Multidisciplinary committee(including 3 English native speakers)
- Reach consensus on discrepancies

Pre-test
- 50 subjects with musculoskeletal symptoms
- Develop a final Korean version of the WRFQ(WRFQ-K)

Fig. 1. The cross-cultural adaptation process.

(1) Forward Translation

The forward translation was performed by four independent bilingual translators whose mother tongue were Korean. Two of the four translators were aware of the objectives and concepts associated with this questionnaire and had a medical background with previous experience in translating medical journals and documents. Whereas, the rest of the translators who performed the forward translation had neither medical nor rehabilitation background and were blinded to the concept being measured. Instead, they are better at English as they had received a formal school education in English speaking countries. This is according to a recommended method in previous studies(Guillemin F 1993, Beaton DE 2000). In this way, the probability of reaching equivalence of both perspectives increases.

(2) Synthesis

The four different results were integrated into a new version by the two of translators and one expert committee member who majored in Korean Literature. Many discrepancies between them were found and discussed. After comparison of all the sentences, they underlined each item deemed necessary for correction in meaning. Final consensus was reached after enough debates on the sentences with underlines.

(3) Backward Translation

Synthesized Korean version of the questionnaire was translated into English again in order to reduce semantic and conceptual differences by two oversea Korean translators. They had no background of medicine or rehabilitation and were not aware of the study objectives. This process was done after four weeks from the synthesis to minimize possible recall bias.

(4) Consolidation of translations by a committee of experts

A multidisciplinary committee consisting of an occupational physician, a clinical research coordinator, three native English teachers was set up to consolidate all the results of the translations and to develop a pre-final Korean version of the WRFQ. The discrepancies between the backward translations and the original version of the questionnaire were examined and discussed about what causes the differences. A final consensus was reached for almost every issue and all uncertainties which were not well clarified by enough discussion among committee members who have different social and cultural backgrounds.

(5) Pre-test

Fifty volunteer workers of both sexes, with physical(musculoskeletal) and/or mental(anxiety and/or depression) health problems with a minimum duration of 4 weeks were recruited when they visited an in-company clinic with the purpose of

medical check up. They all speak Korean as their first language. And they were able to read and understand the questionnaire and were working at least 45h/week during the past 4 weeks. The subjects completed the Korean version of the WRFQ and were guided to point out and discuss any items that were difficult or confusing to understand. Their comments were recorded and the average time for the interviews was 20 minutes.

3. Data collection

Alongside the pre-test, two types of questionnaires were administered to get more information about musculoskeletal and psychological problems as well as subject's general characteristics. We adopted a musculoskeletal symptoms questionnaire (KOSHACODE H-30-2003) which is used for the screening and surveillance of work-related musculoskeletal disorders. It was developed to be able to adapt NIOSH(National Institute of Occupational Safety & Health) symptom criteria for musculoskeletal disorders(Choi et al., 2008; Hales TR et al., 1994).

The questionnaire consists of duration, frequency, and severity of the symptoms on each part of the body and type of curing actions(seeing the doctor, self treatment) or measures(sick leave, conversion of work) they took for the symptoms. Subjects can move on to the next step if they have not experienced any pain or discomfort in the past year. Aching parts are comprised of head, shoulders, arms/elbows, hands/wrists/fingers. High physical disorder group was defined as subjects with over than moderate levels of pain on any body parts for at least 4 weeks. Continuous variables were converted to the ordinal scale

according to distribution to make the model stable and ensure biological plausibility.

Researches about psychological aspect were conducted along with the other questionnaires. Depression and anxiety, two typical psychological problems were measured by using associated tools. We used CES-D(Center for Epidemiological Studies-Depression Scale), which was developed to measure current levels(within the past few weeks) of depressive symptoms in the general population(Radloff LS. 1977). More than 21 points was set as the cut off value for depressive disorder group according to the result of one previous research for screening depression in Korea(cho MJ. 1998). Likewise, BAI(Beck Anxiety Inventory) was used to sort out anxiety disorder group. Scoring more than 22 points was regarded to have anxiety disorder(Yook SP. 1997).

4. Statistical analysis

Initially, descriptive analysis was carried out to explore the basic characteristics of the participants. Data were analyzed by SPSS for windows, version 19.

To evaluate the internal consistency, the Cronbach's alpha coefficient was calculated for each subscale of the questionnaires. The value of $\geq$ 0.70 was considered satisfactory(Cronbach LJ. 1951). The repeatability or stability of the instrument was assessed through test-retest reliability. The Korean WRFQ was administered to the same group of 50 workers at two different time points. The retest was conducted at least 2 weeks later. This period was considered sufficient to avoid the memory of responses and prevent variations on the observed

phenomenon that could affect repeatability. The intraclass correlation coefficient(ICC) was calculated to evaluate the test-retest reliability. The stability or repeatability of a subscale or total scale was considered good when the ICC was above 0.70 and very good when it was above 0.90(Terwee CB et al., 2007).

Content validity of the Korean WRFQ was empirically evaluated by the members of the expert committee throughout the cross-cultural adaptation process and through qualitative analysis of the comments provided by the pre-testing participants. Completeness of item response scores, distribution, and percentage of ceiling and floor scores were observed using descriptive statistics. The floor and ceiling effects occur when a percentage of responses to certain questions cluster at the top or the bottom of the scale. The presence of those effects indicates a lack of discriminative ability of the question and the absence of the questionnaire's ability to differentiate between high and low scores. Content validity was regarded as good when floor and ceiling effects do not exceed 15%(Terwee CB et al., 2007).

In order to establish whether the Korean version of the WRFQ really measured what it was expected to measure, construct validity was evaluated comparing the median values of the subscale scores between physical and mental disorder groups. It was hypothesized that patients with only mental illness would get lower score in the subscales of psychological and social demands, and patients with only physical illness would score lower in the subscales of work scheduling, output and physical demands(Lerner D et al., 2002). The different characteristics between groups were expected to reflect good construct validity. Comparisons between groups were performed by the Mann-Whitney non-parametric test.

III. RESULTS

Table 1 shows general characteristics of the study subjects. The study sample was composed of 36 men and 14 women, with a mean age of 32.5 years. Due to the nature of the job, workers in their twenties were the highest(46.0%) and majority of job type was manual(80.0%). Most frequent aching part was neck(46.0%), followed by shoulder(38.0%) and back(36%). 66.0% of the workers have only a high school diploma or less than that. 24% of the subjects were classified as depressive disorder group and 10% were as anxiety disorder group.

Table 1. General characteristics of study subjects

Unit: Person(%)

Characteristics		
Age	Mean±SD	32.5±9.4
	≦29	23(46.0)
	30-39	16(32.0)
	≧40	11(22.0)
Gender		
	Male	36(72.0)
	Female	14(28.0)
Job type		
	Manual	40(80.0)
	Non-manual	10(20.0)
Site of MSD*		
	Neck	23(46.0)
	Shoulder	19(38.0)
	Arm	8(16.0)
	Hand	10(20.0)
	Back	18(36.0)
	Leg	10(20.0)
Educational level		
	≦High school	33(66.0)
	>High school	17(34.0)
Mental health		
	Depressive disorder group†	12(24.0)
	Anxiety disorder group§	5(10.0)
Total		50(100.0)

* Musculoskeletal disorder, aching parts can be overlapped

† CES-D score ≧21

‡ BAI score ≧22

Table 2 shows the average scores for each subscale of pre-test results. Higher score indicates better work functioning on the job. The flexibility demands subscale scored the highest(63.0 SD = 26.1) and the physical demands the lowest(45.3 SD = 23.5). Subscales with more than 20 % of "does not apply to my job" or missing values were excluded. The subscale that most frequently obtained the answer "does not apply to my job" was physical demands. Floor effect was not observed in any subscales. Ceiling effect was the lowest in work scheduling & output demands(2.0%) and the highest in flexibility demands(6.0%). The Cronbach's alpha was 0.92 for the total scale. All subscales obtained Cronbach's alpha coefficients above 0.70 which is considered satisfactory.
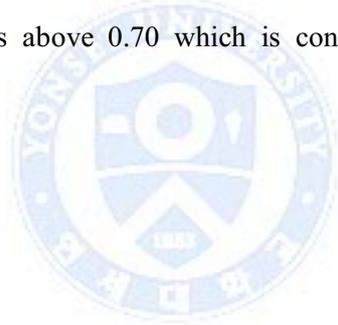
Table 2. Pre-test results with the Korean version of the Work Role Functioning Questionnaire (WRFQ) (n = 50)

	Valid	Mean	floor effect (0 %)	ceiling effect (100%)	Cronbach's alpha[‡]
	N(missing or not applicable)	(SD)	N(%)	N(%)	
Work scheduling & output demands	50 (0)	56.9 (21.9)	0 (0.0)	1 (2.0)	0.93
Physical demands	43 (7)	45.3 (23.5)	0 (0.0)	2 (4.0)	0.72
Mental & social demands	48 (2)	59.5 (24.7)	0 (0.0)	2 (4.0)	0.91
Flexibility demands	49 (1)	63.0 (26.1)	0 (0.0)	3 (6.0)	0.88
Total score	50 (0)	53.9 (18.2)	0 (0.0)	0 (0.0)	0.92

* Subscales with more than 20% of "does not apply to my job" or missing values were excluded

[†] Each subscale is scored from 0 to 100. Higher score indicates better work functioning

[‡] The value of ≥0.70 Cronbach's alpha coefficient was considered satisfactory

Table 3 shows the results of the test-retest reliability. The Intraclass Correlation Coefficients(ICC) for the test-retest reliability were ranged between 0.83(95% CI: 0.72-0.90, Physical demands) and 0.94(95% CI: 0.89-0.94, Flexibility demands). The ICC for the total scale was 0.90(95% CI: 0.83-0.94).

Table 3. Test-retest reliability

Subscales	Test-retest ICC	95% CI
Work scheduling & output demands	0.92	(0.87-0.96)
Physical demands	0.83	(0.72-0.90)
Mental & social demands	0.88	(0.80-0.93)
Flexibility demands	0.94	(0.89-0.96)
Total score	0.90	(0.83-0.94)

* Intraclass correlation coefficient : ICC

✝ ICC >0.70 : good, >0.90 : very good

Table 4 shows construct validity of WRFQ through statistical analysis by type of health problem. Each score was calculated by median value since the curves did not follow a normal distribution. Mann-Whitney non-parametric test was carried out to compare the variables of each subscale. The p-value less than 0.05 is considered statistically significant. High physical disorder group was defined as subjects with over than moderate level of pain on any body parts for at least 4 weeks. Having the score of CES-D $\geqq 21$ or BAI $\geqq 22$ classified into mental disorder group.

Construct validity was considered proper. The difference of physical demands scores between the two groups(low and high) were statistically significant($p<0.05$). On the other hand, the state of mental disorders strongly influences on overall subscales except physical demands. The difference of physical demands score according to mental disorder was not found.

Table 4. Subscale description by type of health problem

	Mental disorder			Physical disorder		
	No	Yes	P-value†	Low	High	P-value†
Work scheduling & output demands	68.8	33.8	<0.001	57.5	57.5	0.317
Physical demands	44.4	33.1	0.841	55.0	31.3	0.018
Mental & social demands	75.0	32.1	<0.001	67.9	71.4	0.244
Flexibility demands	81.3	40.6	<0.001	56.3	68.8	0.442

* Each score was calculated by median, scored from 0-100, the higher the better work functioning

† P-value by Mann-Whitney non-parametric test, p<0.05 is considered Statistically significant

‡ High physical disorder group : $\geq$ moderate level of pain on any body parts for at least 4 weeks

§ Mental disorder group : CES-D $\geq$ 21 or BAI $\geq$ 22

IV. DISCUSSION

The purpose of this study was to conduct the cross-cultural adaptation of the WRFQ to Korean and to assess its usability in Korean health care service field. Translation of questionnaires or instruments into other languages is not sufficient to just do a simple translation because of cultural differences. Therefore, a research was performed to establish a systematized standards for the cultural adaptation of instruments used in the occupational health field((Beaton DE et al., 2000). Cross-cultural adaptation of the WRFQ to Korean followed the guidelines and standards.

The translations were carried out with the assistance of multidisciplinary committee consisting of various occupational backgrounds. Issues discussed and solved by the committee led to the clarification of important issues and ensured that the questionnaire was understandable. In the process of consolidation, many changes were made to illuminate some uncertainties. We focused on the words that can be equivocal or ambiguous when translated into Korean. In the example at the top, the word "difficult" could be interpreted into two ways in Korean. The first meaning of it is "not easy to do, understand, or deal with". It also can be understood as the meaning of "strenuous activity action that involves a lot of energy or effort". So we decided to use both words using a bracket for more clarification on this point.

The forward translation was carried out without any trouble. Translaters tried to make a faithful translation of the original and to integrate them into a new version. Several discrepancies were found related to the idiomatic usage of words in items 1(get going easily), 19(losing my train of thought), 22(control my temper), 27(to show initiative), which were debated and reached into a consensus. However, we could not tell the difference between items 16(keep my mind on my work) and 18(concentrate on my work) at this point.

When the backward translation was done and compared with the original English version, some items were found to have a number of alternative meanings and required reconsideration by the committee of experts. They were items 1(get going easily), 3(extra breaks or rests), 4(stick to a routine), 11(lift, carry, or move), 12(stay in one position), 16(keep my mind on), 18(concentrate on), 19(losing my train of thought), 22(control my temper), 25(process incoming information), 26(perform multiple tasks).

A group of multidisciplinary committee of experts including three native English teachers consolidated all the discrepancies and changed some terminologies, word order, even the basic rules of grammar to consider the differences in nuance. After which, a pre-final version of the WRFQ in Korean(WRFQ-K) was administered to the subjects for the pre-test.

During the pre-test, person to person interviews were carried out with the participants to assess difficulties in filling out the questionnaire and to clarify any questions or terms that might have been unable or hard to understand. Most subjects did not have major difficulties with the questionnaire. Some minor problems were found and debated.

The physical demand subscale scored the lowest in this study, which coincides with previous studies(Ramada JM et al., 2013; Gallasch CH et al., 2007). We found that the difference between physical demand and the other subscales in this study is bigger than expected. It is because the proportion of manual workers in our study(80.0%) is much greater than in the other studies(17.1%, 42.5%). Generally, manual workers do physical activity using their hands or physical strength rather than the mind. So, they are more inclined to injuries or physical disorders than non-manual workers.

The results of the pre-test was quite competent. Completeness of item response was very high, percentages of the floor and ceiling effect were very low for each scale. The answer "not applicable to my job" was more frequently selected in Physical demands. The same pattern was observed in previous studies(Durand MJ et al., 2004; Abma FI et al., 2012). A likely cause is that these descriptions of the movements and tasks are somewhat specific to particular manual works. In contrast, the items from the other scales are more general in the sense that they are applicable to practically any type of job(Ramada JM et al., 2013).

Internal consistency was satisfactory for all subscales(Cronbach's alpha between 0.72 and 0.93), although it was a bit low in physical demands(Cronbach's alpha = 0.72) in comparison with other subscales. It is assumed that type of difficulties could be somewhat different depending on the aching part or characteristics of work. Test-retest reliability showed good stability, with intra-class correlation coefficients between 0.83 and 0.94 for all subscales.

The time between test and retest was at least 2 weeks, which considered sufficient to reduce recall bias. Some previous studies conducted the retest just

after 2days or 7days at least(Ramada JM et al., 2013; Gallasch CH et al., 2007). But, we tried to avoid the memory of responses as possible as we could.

Likewise, construct validity was considered high based on the comparison of median scores with different type of disorder groups. For the first time in this field, we adapted authorized tools such as NIOSH symptom criteria for musculoskeletal disorders(Korean version, KOSHACODE H-30-2003) and CES-D, BAI to clarify the working definitions used in this study. Since there have been no researches that subdivided aching parts by an authorized categorization, further researches will be able to study more correct correlations between aching parts of the body and each subscale score. Limitations of this study could be the small size of the sample in the pre-test and asymmetric proportion of jobs and the gender, although unavoidable.
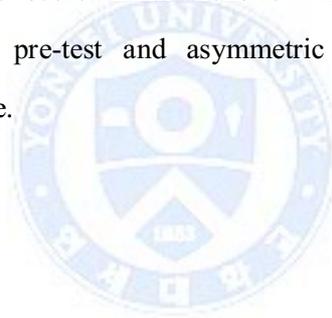
V. CONCLUSION

The translation and cross-cultural adaptation of the Work Role Functioning Questionnaire(WRFQ) was successful without major problems. The Korean version of the WRFQ (WRFQ-K) demonstrated excellent acceptability and psychometric properties. This study also proved its usefulness in terms of validity and reliability. Even though there are still some limitations that further studies should examine, we believe that our results can help researchers and clinicians to measure outcomes of work rehabilitation interventions and to evaluate return to work program of injured workers.
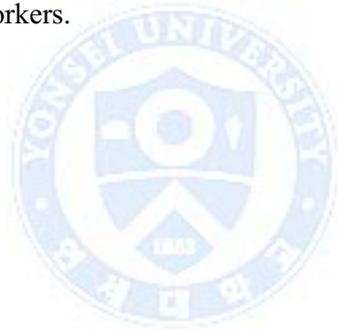
Appendix 1. Work Role Functioning Questionnaire 2.0_Korean

작업 기능 평가표 2.0

일과 건강

● 이 설문지는 지난 4주 동안 당신의 직장에서 일과 관련된 특정 부분에 대하여 힘들고 어려웠던 정도와 지속시간을 측정하여 평가하기 위한 것입니다.

● 근무 외의 시간에 발생한 어려움 및 증상은 해당되지 않습니다.

● 질문 내용이 본인의 업무와 관계없는 경우, '관련 없음'에 표시해 주시기 바랍니다.

● "나는....가 어려웠다(힘들었다)"라는 문항에 27항목을 넣어서 해당되는 부분에 ∨표를 해주십시오.

지난 4주 동안 직장에서 근무하는 중, 당신의 육체적인 혹은 정신적인 문제로 인하여 아래의 항목들을 수행하는데 있어 얼마만큼의 (오랜 시간 동안) 어려움을 느꼈습니까?

나는....가 어려웠다(힘들었다)	항상 (100%)	대부분	절반 (50%)	가끔	전혀 (0%)	관련 없음
1. 전반적인 일과를 쉽게 시작하기						
2. 나에게 주어진 업무를, 직장에 도착하자마자 바로 시작하기						
3. 규정된 휴식시간(점심시간 등) 외에 임의적인 휴식 없이 쉬지 않고 일하기						
4. 정해진 계획이나 통상적인 업무 순서에 맞춰 일을 하기						
5. 충분히 빠른 속도로 일하기						
6. 일을 제 시간에 끝내기						
7. 실수 없이 일을 하기						
8. 내 업무성과를 판단하는 사람을 만족시킬 만큼 일하기						
9. 내 일에서 성취감을 느끼기						
10. 내가 할 수 있는 최대의 능력을 다해서 일했다고 느끼기						

지난 4주 동안 직장에서 근무하는 중, 당신의 육체적인 혹은 정신적인 문제로 인하여 아래의 항목들을 수행하는데 있어 얼마만큼의 (오랜 시간 동안) 어려움을 느꼈습니까?						
나는....가(이) 어려웠다(힘들었다)	항상 (100%)	대부분	절반 (50%)	가끔	전혀 (0%)	관련 없음
11. 약 4.5kg 이상의 물건을 들어올리거나, 들어서 혹은 끌어서 운반하기						
12. 15분 이상 앉아있거나 서있기, 또는 같은 장소에서 계속 근무하기						
13. 같은 동작을 여러 번 반복하기						
14. 굽히거나 비트는 동작, 또는 팔을 뻗는 동작을 하기						
15. 소형 공구나 손에 쥐는 작은 도구(예: 전화기, 펜, 드릴 등)를 사용하기						
16. 업무에만 신경 쓰기						
17. 일을 꼼꼼히(신중하게) 하기						
18. 집중해서 일하기						
19. 정신을 딴 데 팔지 않고 일하기						
20. 필요한 정보를 쉽게 읽거나 처리하면서 일하기						
21. 사람들과 통화하거나 직접 만나서 대화하는 것						
22. 주변사람들에게 내 감정을 자제하며 일하기						
23. 내 일의 우선순위를 정하기						

24. 업무의 변화에 대처해가며 일하기						
25. 유입되는 정보들을(예: 이메일) 시간에 맞춰(늦지않게) 처리하기						
26. 다양한 종류의 많은 일들을 동시에 처리하기						
27. 주도적으로(솔선수범하여)일하기						

Appendix 2. Musculoskeletal symptoms questionnaire (KOSHACODE H-30-2003)

I. 지난 1년 동안 손/손가락/손목, 팔/팔꿈치, 어깨, 허리, 다리/발 중 어느 한 부위에서라도
귀하의 작업과 관련하여 통증이나 불편함(통증, 쑤시는 느낌, 뻣뻣함, 화끈거리는 느낌, 무감각 혹은 찌릿찌릿함 등)을 느끼신 적이 있습니까?

□ 아니오(수고하셨습니다. **II번, 정신건강 조사표**를 기입 해 주십시오)
□ 예("예"라고 답하신 분은 아래 표의 **통증부위**에 체크(∨)하고, 해당 통증부위의 **세로줄**로 내려가며 해당사항에 체크(∨)해 주십시오)

통증 부위	목( )	어깨( )	팔/팔꿈치( )	손/손목/손가락( )	허리( )	다리/발( )
1. 통증의 구체적 부위는?		☐ 오른쪽 ☐ 왼쪽 ☐ 양쪽 모두	☐ 오른쪽 ☐ 왼쪽 ☐ 양쪽 모두	☐ 오른쪽 ☐ 왼쪽 ☐ 양쪽 모두		☐ 오른쪽 ☐ 왼쪽 ☐ 양쪽 모두
2. 한번 아프기 시작하면 통증 기간은 **얼마 동안** 지속됩니까?	☐ 1일 미만 ☐ 1일 – 1주일 미만 ☐ 1주일 – 1달 미만 ☐ 1달 – 6개월 미만 ☐ 6개월 이상	☐ 1일 미만 ☐ 1일 – 1주일 미만 ☐ 1주일 – 1달 미만 ☐ 1달 – 6개월 미만 ☐ 6개월 이상	☐ 1일 미만 ☐ 1일 – 1주일 미만 ☐ 1주일 – 1달 미만 ☐ 1달 – 6개월 미만 ☐ 6개월 이상	☐ 1일 미만 ☐ 1일 – 1주일 미만 ☐ 1주일 – 1달 미만 ☐ 1달 – 6개월 미만 ☐ 6개월 이상	☐ 1일 미만 ☐ 1일 – 1주일 미만 ☐ 1주일 – 1달 미만 ☐ 1달 – 6개월 미만 ☐ 6개월 이상	☐ 1일 미만 ☐ 1일 – 1주일 미만 ☐ 1주일 – 1달 미만 ☐ 1달 – 6개월 미만 ☐ 6개월 이상
3. 그때의 아픈 정도는 **어느 정도** 입니까? (보기 참조)	☐ 약한 통증 ☐ 중간 통증 ☐ 심한 통증 ☐ 매우 심한 통증	☐ 약한 통증 ☐ 중간 통증 ☐ 심한 통증 ☐ 매우 심한 통증	☐ 약한 통증 ☐ 중간 통증 ☐ 심한 통증 ☐ 매우 심한 통증	☐ 약한 통증 ☐ 중간 통증 ☐ 심한 통증 ☐ 매우 심한 통증	☐ 약한 통증 ☐ 중간 통증 ☐ 심한 통증 ☐ 매우 심한 통증	☐ 약한 통증 ☐ 중간 통증 ☐ 심한 통증 ☐ 매우 심한 통증
	<보기>	**약한 통증** : 약간 불편한 정도이나 작업에 열중할 때는 못 느낀다 **중간 통증** : 작업 중 통증이 있으나 귀가 후 휴식을 취하면 괜찮다 **심한 통증** : 작업 중 통증이 비교적 심하고 귀가 후에도 통증이 계속된다 **매우 심한 통증** : 통증 때문에 작업은 물론 일상생활을 하기가 어렵다				
4. **지난 1년 동안** 이러한 증상을 얼마나 자주 경험하셨습니까 ?	☐ 6개월에 1번 ☐ 2-3달에 1번 ☐ 1달에 1번 ☐ 1주일에 1번 ☐ 매일	☐ 6개월에 1번 ☐ 2-3달에 1번 ☐ 1달에 1번 ☐ 1주일에 1번 ☐ 매일	☐ 6개월에 1번 ☐ 2-3달에 1번 ☐ 1달에 1번 ☐ 1주일에 1번 ☐ 매일	☐ 6개월에 1번 ☐ 2-3달에 1번 ☐ 1달에 1번 ☐ 1주일에 1번 ☐ 매일	☐ 6개월에 1번 ☐ 2-3달에 1번 ☐ 1달에 1번 ☐ 1주일에 1번 ☐ 매일	☐ 6개월에 1번 ☐ 2-3달에 1번 ☐ 1달에 1번 ☐ 1주일에 1번 ☐ 매일
5. **지난 1주일 동안**에도 이러한 증상이 있었습니까 ?	☐ 아니오 ☐ 예	☐ 아니오 ☐ 예	☐ 아니오 ☐ 예	☐ 아니오 ☐ 예	☐ 아니오 ☐ 예	☐ 아니오 ☐ 예
6. **지난 1년 동안** 이러한 통증으로 인해 어떤 일이 있었습니까 ?	☐ 병원·한의원 치료 ☐ 약국치료 ☐ 병가, 산재 ☐ 작업 전환 ☐ 해당사항 없음 기타 ( )	☐ 병원·한의원 치료 ☐ 약국치료 ☐ 병가, 산재 ☐ 작업 전환 ☐ 해당사항 없음 기타 ( )	☐ 병원·한의원 치료 ☐ 약국치료 ☐ 병가, 산재 ☐ 작업 전환 ☐ 해당사항 없음 기타 ( )	☐ 병원·한의원 치료 ☐ 약국치료 ☐ 병가, 산재 ☐ 작업 전환 ☐ 해당사항 없음 기타 ( )	☐ 병원·한의원 치료 ☐ 약국치료 ☐ 병가, 산재 ☐ 작업 전환 ☐ 해당사항 없음 기타 ( )	☐ 병원·한의원 치료 ☐ 약국치료 ☐ 병가, 산재 ☐ 작업 전환 ☐ 해당사항 없음 기타 ( )

Appendix 3. CES-D(Center for Epidemiological Studies-Depression Scale)

우울

아래에 있는 항목들은 지난 일주일 동안의 당신의 상태에 대한 질문입니다. 그와 같은 일들이 지난 1주일 동안 얼마나 자주 일어났었는지 답변해 주십시오.

극히 드물다.	가끔 있었다.	종종 있었다.	대부분 그랬다.
(1주일 동안 1일 이하)	(1주일 동안 1 – 2일)	(1주일 동안 3 – 4일)	(1주일 동안 5일 이상)

지난 1주일동안 나는	1일 이하	1~2일	3~4일	5일 이상
1. 평소에는 아무렇지도 않던 일들이 괴롭고 귀찮게 느껴진다.	☐	☐	☐	☐
2. 먹고 싶지 않고 식욕이 없었다.	☐	☐	☐	☐
3. 어느 누가 도와준다 하더라도 나의 울적한 기분을 떨쳐버릴 수 없을 것 같았다.	☐	☐	☐	☐
4. 무슨 일을 하든 정신을 집중하기가 힘들었다.	☐	☐	☐	☐
5. 비교적 잘 지냈다.	☐	☐	☐	☐
6. 상당히 우울했다.	☐	☐	☐	☐
7. 모든 일들이 힘들게 느껴졌다.	☐	☐	☐	☐
8. 앞일이 암담하게 느껴졌다.	☐	☐	☐	☐
9. 지금까지의 내 인생은 실패작이라는 생각이 들었다.	☐	☐	☐	☐
10. 적어도 보통 사람들만큼의 능력은 있었다고 생각한다.	☐	☐	☐	☐
11. 잠을 설쳤다(잠을 잘 이루지 못했다).	☐	☐	☐	☐
12. 두려움을 느꼈다.	☐	☐	☐	☐
13. 평소에 비해 말수가 적었다.	☐	☐	☐	☐
14. 세상에 홀로 있는 듯한 외로움을 느꼈다.	☐	☐	☐	☐
15. 큰 불만 없이 생활 했다.	☐	☐	☐	☐
16. 사람들이 나에게 차갑게 대하는 것 같았다.	☐	☐	☐	☐
17. 갑자기 울음이 나왔다.	☐	☐	☐	☐
18. 마음이 슬펐다	☐	☐	☐	☐
19. 사람들이 나를 싫어하는 것 같았다.	☐	☐	☐	☐
20. 도무지 뭘 해 나갈 엄두가 나지 않았다.	☐	☐	☐	☐

Appendix 4. BAI(Beck Anxiety Inventory)

불안

각 문장을 자세히 읽어보시고 오늘을 포함해서 지난 한 주 동안 자신의 상태를 가장 잘 나타낸다고 생각되는 곳에 표시하여 주십시오.

지난 1주일간 나는	전혀 느끼지 않았다	조금 느꼈다	상당히 느꼈다	심하게 느꼈다
1. 가끔씩 몸이 지리고 쑤시며 감각이 마비된 느낌을 받는다.	☐	☐	☐	☐
2. 흥분된 느낌을 받는다.	☐	☐	☐	☐
3. 가끔씩 다리가 떨리곤 한다.	☐	☐	☐	☐
4. 편안하게 쉴 수가 없다.	☐	☐	☐	☐
5. 매우 나쁜 일이 일어날 것 같은 두려움을 느낀다.	☐	☐	☐	☐
6. 어지러움(현기증)을 느낀다.	☐	☐	☐	☐
7. 가끔씩 심장이 두근거리고 빨리 뛴다.	☐	☐	☐	☐
8. 침착하지 못하다.	☐	☐	☐	☐
9. 자주 겁을 먹고 무서움을 느낀다.	☐	☐	☐	☐
10. 신경이 과민 되어 왔다.	☐	☐	☐	☐
11. 가끔씩 숨이 막히고 질식할 것 같다.	☐	☐	☐	☐
12. 자주 손이 떨린다.	☐	☐	☐	☐
13. 안절부절 못해 한다.	☐	☐	☐	☐
14. 미칠 것 같은 두려움을 느낀다.	☐	☐	☐	☐
15. 가끔씩 숨쉬기 곤란할 때가 있다.	☐	☐	☐	☐
16. 죽을 것 같은 두려움을 느낀다.	☐	☐	☐	☐
17. 불안한 상태에 있다.	☐	☐	☐	☐
18. 자주 소화가 잘 안되고 배 속이 불편하다.	☐	☐	☐	☐
19. 자주 얼굴이 붉어지곤 한다.	☐	☐	☐	☐
20. 가끔씩 기절할 것 같다.	☐	☐	☐	☐
21. 땀을 많이 흘린다(더위로 인한 경우는 제외).	☐	☐	☐	☐

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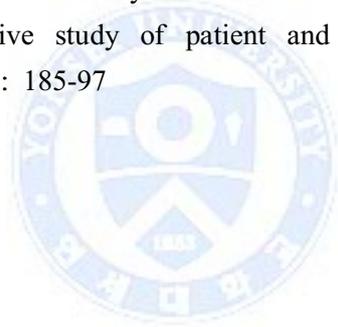
국문초록

비교 문화적 방법을 통한 Work Role Functioning Questionnaire 의 한국어 번역

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김정호

　Work Role Functioning Questionnaire(WRFQ)는 전 세계적으로 널리 사용되고 있는 평가도구이며, 주로 근로자의 작업 복귀를 판단하거나 재활치료 및 훈련의 효과를 평가하기 위하여 사용된다. 우리는 외국의 여러 나라에서 WRFQ를 번역하는데 사용된 가이드라인을 이용하여 이를 체계적이고, 정확하게정확하게 번역고자 하였다.

　번역 과정은 산업보건 분야에서 서로 다른 문화 간의 설문지 번역을 위해 제시된 방법을 이용하였다. 4명의 번역자들이 각각 영어 원문을 한글로 번역한 후 이를 취합하고 수정하였으며, 이 결과물을 두 명의 영어권 교포들이 다시 영어로 번역하는 작업을 하였다. 재 번역 결과 발견된 문제점들은 전문위

원회의 심의를 거쳐 최종 수정하였다.

 크론바흐 알파계수를 구하여 내적 일관성을 평가하고, 최소 2주간의 간격을 둔 재시험법을 통하여 급내상관계수를 구하였다. 바닥효과와 천장효과의 비율을 측정하여 내용타당도가 적절한지 보았다. 마지막으로, 구성타당도를 검증하기 위하여 검사의 결과가 실제 기대되는 방향과 일치하는지 확인하였다. 즉, 신체적 증상을 호소하는 정도에 따라 실제 설문의 신체증상과 관련된 세부항목들의 설문 결과에 통계적으로 유의한 차이가 있는지 보았고, 반대로 정신적 증상을 호소하는 그룹에서는 이러한 경향이 어떻게 나타나는지 연구하였다.

 설문 대상은 남자 36명, 여자 14명으로 남자가 더 많았으며, 20대가 46%, 생산직 근로자가 80%로 대부분을 차지하였다. 크론바흐 알파계수는 전체 영역에서 0.92의 높은 값을 보였으며, 모든 세부항목에서 0.70 이상의 결과를 보였다. 재검사법 결과 급내상관계수는 항목별로 0.83(95% CI: 0.72-0.90, Physical demands)에서 0.94(95% CI: 0.89-0.94, Flexibility demands)의 값을 가졌으며, 전체 영역에서는 0.90(95% CI: 0.83-0.94)의 결과를 나타내었다. 신체증상의 호소 정도에 따라 Physical demands 영역에서의 점수가 통계적으로 유의한 차이를 나타내었다($p > 0.05$).

 WRFQ의 원문 번역은 체계적인 과정을 통하여 성공적으로 이루어졌으며, 높은 신뢰도와 타당도를 보여주었다. 이 결과물이 우리나라의 보건의료와 관련된 많은 영역에서 충분히 활용되고, 또한 추후 다른 연구의 기반이 되었으면 한다.

핵심 되는 말: Work Role Functioning Questionnaire(WRFQ), 근골격계 질환, 작업 복귀, 근로자 재활