MaiValidation the Chinese Version of Work Motivation Scale for Health Workers

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Methodology

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Abstract

Background: The Work Motivation Scale for Health Workers (WMSHW) is a 15-item multidimensional scale developed to measuring health workers' motivation composition based on Self-Determination Theory. The objective of the present study is to translate, adapt, and validate the WMSHW among Chinese health workers.

Methods: The process of translation and cross-cultural adaptation followed the recommendations of international guidelines. Participants include 1341 health workers within 75 primary health institutions from 6 provinces in China. The reliability and validity of the scale was analyzed.

Results: Confirmatory factor analysis indicated that the modified five-factor model had better fit than the other models in accordance with the original English version. The factor loads were high and ranged from 0.70 to 0.94. Cronbach's alpha coefficients for five dimensions of the Chinese WMSHW ranged from 0.81 to 0.94, indicating the scale's high internal consistency.

Conclusion: The Chinese version of WMSHW showed satisfactory reliability and validity and can be used as an instrument for measuring the work motivation for Chinese health workers.

Introduction

The availability of motivated health human resources is critical for health system to high quality health care [1]. The health workers motivation was significant related to their turnover intention, job performance and service quality [2–4]. There is growing interest among researchers to study the motivating factors on performance[5]. Some people may more likely be motivated by the enthusiasm and interest of the task, while others may more likely be motivated by the external pressure and benefits. Different sources and levels of motivation may contribute to a completely different performance and outcome. However, the current study treated motivation as a whole and measure overall amount of motivation. Limited availability to directly measure different types of motivation is a major barrier to understand the different composition of motivation.

Self-Determination Theory (SDT) provide a way to measure motivation itself and distinguish different motivation composition. This theory was first described by Edward Deci and Richard Ryan in the mid-1980s, which conceptualize motivation as a continuum of self-determination representing different motivation dimensions with regulatory styles[6, 7]. The first dimension of motivation, which is labelled as intrinsic motivation, and mainly relates to pure enjoyment inherent in the activity itself. The second dimension of motivation is labelled as integrated regulation, which is driven by the congruence between one's behavior and values, identity and needs. The third dimension of motivation is labelled as identified regulation, which is derived form a conscious valuing of goals and values. The fourth dimension of motivation is labelled as introjected regulation, in which behaviors are undertaken to attain ego involvement or to avoid guilt such as pride. The fifth dimension of motivation is labelled as external regulation, which occurs when behaviors are performed for externally rewards or punishments[8].

SDT has become the mainstream motivation theory in the fields of education and sports and other life domains accompanied by the booming of well validated motivation scales development based on SDT [9–12]. In terms of work domain, the first motivation scale —“L’ Inventaire des Motivations au Travail de Blais” (Blais Inventory of Work Motivation) based on SDT was developed in France [13]. There has been a growing trend in development and evaluation of work motivation measurement such as Work Extrinsic and Intrinsic Motivation Scale [14] and Multidimensional Work Motivation Scale [15]. Most recent studies focus on the whole employees, while less attention is paid to the occupational particularity of health workers. The Work Motivation Scale for Health Workers (WMSHW) is a 15-item multidimensional scale developed to measure work motivation composition, which has been explicitly designed for use in the medical context [16].

There is growing need for a scale to foster future research that will assess relations between the different types of motivation and organizational level factors. Hence, a well-structured and psychometrically sound tool to measure work motivation of Chinese health workers could help further studies on predictors and outcomes of motivation in Chinese health care settings. To our knowledge, there are no validated instruments in China to measure health motivation among health workers. The WMSHW have only been available in the English language to date, there is a need to adapt and validate this tool within a Chinese-speaking population so as to investigate different composition of work motivation of health workers. This study aims to translate and evaluate the psychometric properties of a Chinese version of the WMSHW among Chinese health workers.

Methods

Measurement of motivation

Considering the specialty of in healthcare contexts, WMSHW has been developed tailored for health workers and has previously been applied and tested in 1142 nurses from government health institutions [16]. All respondent asked to answer the guiding question: “Why are you motivated to work?”, in order to capture their underlying motivation composition for hardworking. The original version of the WMSHW is a 15-item inventory that covers and assesses five dimensions of work motivation: 3 pertaining to intrinsic motivation (e.g. “Because I enjoy doing what I do at work every day”); 1 to integrated regulation (e.g. “Because being a health worker is a fundamental part of who I am.”); 2 to identified regulation (e.g. “Because my work is extremely important for my patients.”), 2 introjected regulation (e.g. “In order to feel good about myself.”) and 7 external regulation (e.g. “Because my supervisor recognizes and appreciates me.” or “In order to earn money”). All items are rated on a 11-point Likert scale ranging from 0 (“No, I disagree completely”) to 10 (“Yes, I agree completely”).

Translation and cross-cultural adaptation were carried out following the previously published international common guidelines [17]. To ensure an accurate translation process, the scale was translated in 4 steps: forward translation from English into Chinese, achieving consensus, back translation into English, and pretesting on health workers. Firstly, two bilingual academic who are familiar

with the health human resource management translated the original English version into Chinese respectively. Secondly, the English and the Chinese versions were discussed by the expert committee to achieve an exact translation. Thirdly, two language specialists who were blinded to the original English version translated the Chinese version into English respectively. Then, a panel of experts experienced in pediatric nursing was then asked to compare and examine discrepancies between these two versions (original English and back-translated English versions) until a unified Back translation scale formed through consensus discussion. Lastly, the Chinese version of the WMSHW was finalized after being well-tested in a representative piloted group of forty health worker.

Participants

A cross-sectional study was conducted for data collection in six provinces throughout the eastern, central and western region of mainland China. A stratified cluster sampling method was applied in this study. Data were collected from 76 primary health institutions (47 in urban area and 28 in rural area). All health workers present on the day of the investigation were invited to participate. Participation was informed that they were voluntary to participate in the study and their responses were anonymous questionnaires. The final sample was made up of 1341 health workers comprising 343 doctors, 317 nurses, 339 public health workers and 342 other medical technicians. 60.2% of health workers were selected from eastern region, 9.9% from central and 29.9% from western region of China.

Statistical analysis

Quantitative variables for scale description were expressed as item means, standard deviations (SDs), skewness and kurtosis. The structural validity and internal consistency of the WMSHW Chinese version were carried out to assess the psychometric properties of the tool.

Confirmatory factor analysis (CFA) with maximum likelihood was conducted to test how well that the items adequately represented their intended dimensions of the work motivation. Goodness-of-fit indices were assessed using the chi square (χ^2), degrees of freedom (df), the comparative fit index (CFI), the root mean square error of approximation (RMSEA), standardized root mean square residual (SRMR), and Akaike information criterion (AIC). For the CFI indices, values close to or greater than 0.95 are taken to reflect a good fit to the data. RMSEA values of less than 0.08 indicate a satisfactory fit, with values ranging to 0.10 representing a mediocre fit [18]. SRMR values of less than 0.08 indicate a good fit [19]. Pearson correlation coefficients was referred to explore intercorrelations among subscales. Internal consistency estimates for both total scale and subscales were evaluated using Cronbach's alpha. An alpha value between 0.70 and 0.90 was considered good and values greater than 0.90 was considered excellent [20].

Statistical analysis was conducted using STATA 14.0 for Windows, while CFA was performed through Mplus software version 7.0 [21]. All two-tailed *p* values less than 0.05 is considered as statistically significant.

Results

Scale description

Table 1 presents the mean scores, SDs, skewness, kurtosis and range of 15 scale items. All mean scores were above 5 (range = 6.39 to 8.13). The highest mean score was found for items Ext6 (8.13 ± 2.19) of external regulation-economic. However, all three items of intrinsic motivation (Im1-Im3) were found to be the lowest mean scores among 15 items. Skewness values ranged from - 0.36 to -1.24, indicating that all items were negatively skewed. None of the items showed extremely leptokurtic distribution as the kurtosis values ranging from 2.37 to 4.13.

Table 1
Item mean scores, standard deviations, ranges, skewness, and kurtosis.

Item	Mean	SD	SK	BK	Range
Intrinsic motivation (IM)					
Im1-Because I enjoy doing what I do at work every day.	6.60	2.66	-0.43	2.43	0–10
Im2-Because I enjoy my work tasks.	6.39	2.71	-0.36	2.37	0–10
Im3-Because the work that I do is very interesting.	6.65	2.65	-0.43	2.39	0–10
Integrated/identified regulation (IDEN)					
Iden1-Because being a health worker is a fundamental part of who I am.	7.50	2.48	-0.84	2.88	0–10
Iden2-Because my work is extremely important for my patients.	7.62	2.45	-0.84	2.86	0–10
Iden3-Because I want to make a difference in people's lives.	7.92	2.28	-1.05	3.50	0–10
Introjected regulation (INTRO)					
Intro1-In order to feel good about myself	7.72	2.31	-1.03	3.61	0–10
Intro2-Because my reputation depends on my work.	6.92	2.71	-0.69	2.73	0–10
External regulation-social (EXT-S)					
Ext1-Because of the appreciation I receive from my patients and the community.	7.02	2.70	-0.77	2.85	0–10
Ext2-So I do not let my team down.	7.43	2.44	-0.89	3.20	0–10
Ext3-Because my supervisor recognizes and appreciates me.	6.87	2.68	-0.69	2.79	0–10
External regulation-economic (EXT-E)					
Ext4-Because of the benefits that come with my job.	7.28	2.45	-0.77	2.99	0–10
Ext5-In order to be able to provide for my family.	7.86	2.32	-1.08	3.65	0–10
Ext6-Because of the financial security my job provides me with.	8.13	2.19	-1.24	4.13	0–10
Ext7-In order to earn money.	7.60	2.56	-0.99	3.28	0–10
SD: standard deviation; SK: Skewness; BK: Kurtosis.					

Structural validity

Five subscales including intrinsic motivation (IM), integrated regulation, identified regulation, introjected regulation (INTRO) and external regulation (EXT), supposed to be included in the WMSHW, which correspond to the five motivation dimensions postulated by SDT. As there is only one integrated regulation item (Iden1), four-factor model was created which combines the integrated and identified regulation dimensions as integrated/identified regulation (IDEN). In addition, two other alternative models were also tested for structural validation. The first alternative model dividing external regulation into a social and an economic subcomponent consists of five factors. The second alternative model consists of two factors where autonomous motivation (AUT) was a combination of IM and IDEN and controlled motivation (CTRL) was a combination of INTRO and EXT.

CFA were conducted to assess how well the three hypothesized models represented the data using maximum likelihood estimation method. The goodness-of-fit indices for three models present in Table 2. We found low goodness-of-fitness indices for both four factor structure and two factor structure, while the five-factor model yielded acceptable fit indices: $\chi^2(80) = 1015$, $p < 0.001$, CFI = 0.94, RMSEA = 0.093, and SRMR = 0.059. The result revealed that five-factor model proposed by the original authors [16] was accepted as the best-fitting model compared to other two models.

Table 2
Goodness-of-fit indices for different models

Model		χ^2	df	RMSEA	CFI	SRMR	AIC
Four-factor model	IM (Im1-Im3), IDEN (Iden1-Iden3), INTRO (intro1-intro2), EXT (Ext1-7)	3413***	84	0.172***	0.801	0.101	80610
Five-factor model	IM (Im1-Im3), IDEN (Iden1-Iden3), INTRO (intro1-intro2), EXT-S (Ext1- Ext 3), EXT-E (Ext4- Ext 7)	1015***	80	0.093***	0.944	0.059	78219
Two-factor model	AUT (Im1-Iden3), CTRL (intro1- Ext17)	4360***	89	0.189***	0.745	0.110	81547
*** $p < 0.001$; df: degrees of freedom; RMSEA: root mean square error of approximation; CFI: comparative fit index; SRMR: standardized root mean square residual; AIC: Akaike information criterion; IM: intrinsic motivation; IDEN: integrated/identified regulation; INTRO: introjected regulation; EXT: external regulation; EXT-S: external regulation-social; EXT-E: external regulation-economic; AUT: autonomous motivation; CTRL: controlled motivation.							

As seen in Fig. 1, all standardized factor loadings were over 0.5 and statistically significant, ranging from 0.69 to 0.94. The correlation among five factors ranged from 0.31 to 0.81, indicating that they are related, but measure different dimensions of work motivation. More specifically, the correlations between each

subscale followed the theory hypothesized as the less nonadjacent subscales are less strongly positive related.

Reliability

Cronbach's alpha coefficients were 0.93 for the total scale, 0.94 for the IM subscale, 0.89 for the IDEN subscale, 0.81 for the INTRO subscale, 0.82 for the external regulation-social (EXT-S) subscale and 0.88 for the external regulation-economic (EXT-E) subscale, showing that the Chinese version of the WMSHW demonstrated strong internal consistency.

Discussion

In the present study, we sought to examine the psychometric properties of a Chinese translation of the WMSHW. The current results provide supportive evidence regarding the cross-cultural reliability and validity of the inventory, so that WMSHW opens a new field of research in relation to work motivation of Chinese health workers by introducing a scale that measures motivation composition. Measuring and evaluating the work motivation of health workers could not only help improve their performance for patients in China, but also enable further internationally comparative studies.

The translated and cross-culturally adapted WMSHW demonstrated a good structural validity and internal consistency among Chinese sample. We used the well-established translation and back-translation guidelines to assure equivalence in varied aspects between source and target versions. During the translation of the English WMSHW into Chinese, a minor cultural discrepancy was encountered and one item of the WMSHW was modified accordingly: 'supervisor' was replaced with 'leader' as this word is closer to Chinese culture. Compared with previous studies that measure work motivation, this is the first study to confirm the structure of WMSHW with population working at health institutions in China without sacrificing any item.

The result of CFA showed that the modified five-factor model had better fit than the other models and selected as the best-fitting model, which was consistent with the original scales. In line with previous study testing the latent structure of work motivation based on SDT in seven languages[15], fit indices in the Chinese version demonstrated slightly lower than the original English version. Culture may have played a role in shaping the understanding of work motivation. Although values of RMSEA are barely within the scope of adequate model fit, our option was not to modify the model considering that the current results suggest that the five-factor model may be a theoretically adequate model for the data based on SDT. Therefore, the current results showed that a Chinese translation of the WMSHW demonstrates five-dimensional factor structure representing IM, IDEN, INTRO, EXT-S, EXT-E as hypothesized. Specifically, IDEN dimension combines integrated regulation and identified regulation which have proven difficult to separate in previous research [15, 22].

In line with previous studies (Maxime A Tremblay, 2009; Christina Moran et al., 2012), the correlation between both factors was identified as moderate, indicating that they are related but measure different

composition of work motivation. Furthermore, strong internal consistency of the Chinese WMSHW was demonstrated, as evidenced by all Cronbach's alpha coefficients over 0.8. In the Chinese WMSHW, the Cronbach's alpha for the total scale (0.94) were much higher than in the English (0.89) versions, and Cronbach's alpha for the five subscales was also higher than in the English version (0.92) [16].

The present study has several limitations that should be noted. First, this study adopted a convenience sampling method for province collection. Hence, bias in these measures may occur. The use of larger sample from various geographical locations is suggested to avoid misspecification of the model and bias in the existing scale. Secondly, the Chinese WMSHW has been tested only among health workers working at primary health care facilities, so further psychometric testing in secondary-level and third-level hospitals and other health settings would contribute to reject or confirm the generalizability of the instrument. Lastly, although our study translated and adapted the English-language scale into the Chinese language using standard procedures, the cultural differences between Western countries and China limit our ability to measure work motivation in Chinese culture contexts. Thus, further development that take culture differences into account is warranted.

Conclusion

In general, cross-cultural translation was successfully completed, and the Chinese version of WMSHW showed good reliability and validity. This inventory could be considered as an appropriate instrument for assessing work motivation of health workers from China. The self-determinant perspective provided insights into a broader set of measure work motivation composition that are associated with work performance as well as potential guidance for healthy workplace promotion. Our study opens a new field of research in relation to work-related behavior by introducing a scale that measures this work motivation.

Declarations

Ethics approval and consent to participate

Not applicable

Consent for publication

Not applicable

Availability of data and materials

The datasets used and analysed during the current study are available from the corresponding author on reasonable request.

Competing interests

The authors declared no potential conflicts of interest.

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Authors' contributions

Huiwen Li drafted the manuscript, designed the study, conducted data analysis and interpretation. Beibei Yuan designed the study, conducted data analysis and critical revision of article for important intellectual content. Yahang Yu and Menggen Yu collected data and did critical revision of article for important intellectual content. All authors gave final approval of the version to be published.

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Figures

Figure 1

Standardized parameter estimates for five-factor model Legend: Coefficients attached to arrows pointing at items from the right: residual variances (i.e. non-explained item variance, error terms); coefficients attached to arrows from factors to items: factor loadings; factor variances were fixed to 1 for model identification; coefficients attached to curved arrows represent factor correlations