

# Psychometric Properties of Persian Version of Organizational Diagnosis Questionnaire in Small-Scale Industries

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## A-R-T-I-C-L-E-I-N-F-O

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## A-B-S-T-R-A-C-T

**Background & Aims of the Study:** Investigating and recognizing effective internal factors of organizations has always been one of the concerns in pursuit of organizational goals and to raise level of personnel's safety, welfare and job performance. This study was aimed to evaluate psychometric characteristics of Organizational Diagnosis Questionnaire (ODQ) in small-scale industries in Hamedan province in Iran, 2016.

**Materials and Methods:** This analytical study was conducted among 397 employees who were selected by simple random sampling. The ODQ questionnaire contains 35 questions, which consists of seven factors. A demographic questionnaire and Paterson's job performance questionnaire were used too. Confirmatory factor analysis (CFA), convergent, and face validity, internal reliability, and test-retest were used to analyze data through SPSS V20 and LISREL V8.5.

**Results:** The mean of total questionnaire was  $3.1 \pm 1.08$ . Cronbach's alpha was 0.96. Results of CFA supported seven dimensions model. Pearson's analysis also showed a correlation between ODQ's factors and job performance ( $p < 0.001$ ). Rewards as a motivational factor was inferior to the other factors. However, relationships, supervisory and purposes were acceptable.

**Conclusion:** The Persian version of ODQ is appropriate for assessing internal conditions in Persian language organizations and it was related to job performance.

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## Background

The development of organizations is synonymous with the evolution of the demands, needs, interests and aspirations of humans. Today, the creation of change in organizations is necessary and inevitable because societies, organizations, rivals, etc. are all changing and any organization that does not follow these changes and also it is stagnant and calm, but is

not in harmony with its own outside environment is doomed to death.

Investigating and recognizing the effective internal factors of organizations has always been one of the concerns of managers and employees in pursuit of organizational goals. It is clear that identification of factors affecting on the organization's internal environment and the quality of interaction of these factors with each other and with the external environment factors, enables the organization to help its

growth and its survival in the area of competition and the accelerated growth of information technology, production, service technologies and leads to the future changes in the organization. Meanwhile, this recognition will significantly help to raise the level of personnel's welfare and safety (1). As Nadler and Tushman (1980) have argued, failure in matching of key components has implications that are reflected in system behavior such as conflict, performance and stress (2). On the other hand, organizational diagnosis is associated with success of the organization and predicts it (3) and is related to the organization performance (4,5).

Ahuja and Narula quoted Raduan and also Cole mentioned that if staff is considered and opportunities are captured for future growth the quality of organization working environment is good; and better performance could be achieved by giving staff facilities and job satisfaction (4). One of the main responsibilities of the managers is to be aware of weaknesses and strengths of the organization by carefully evaluating the organization and analyzing the relationships between variables and then planning and implementing necessary corrective actions. From the ergonomics point of view, having a comprehensive approach to an organization-related issue can provide useful information for improving the organization's conditions. From the perspective of macroergonomics, safety and quality can be improved with proper design of the work system (6). In order to identify organizational issues and move towards improvement, there are several ways that in the organization diagnosis models are among these methods. Examples of the most commonly used organization diagnosis models by the organization's improvement consultants are Nadler and Tushman (1980) (2) Weisbord (1976) (7), Burk and Litwin (1992) (8) and Tichy (1983) (9).

Weisbord describes six factors including purpose, structure, relationships, leadership, rewards and helpful mechanisms in his model. In his opinion, the purpose is the mission and goal of the organization; recognized the structure as the organizing manner, which can be based on the position of the specialists, based on the product or project or team. Relationships is the way people or unites interact also including the way people interact with technology. The rewards are the inherent and external rewards of personnel's work; the next one refers to the style of leadership in the organization. Finally, helpful mechanisms mean budget planning, control and information systems that are essential to achieve organizational goals (10). From time to time, organizations consider their conditions analysis to be necessary. In order to a valid analysis, besides other methods it is necessary to consider the comments of the organization's employees and examine them. Questionnaire is one of the tools and techniques to measure the perceptions of people in the organization.

The macroergonomic surveys of the organization by questionnaire is one of the common methods in macroergonomics that can be a suitable tool at different stages such as the identification of deficiencies, organization's analysis in terms of key characteristics, assessing the impact of changes on the key characteristics and monitor employees feedback when implementing changes (11). The organization's macroergonomic surveys by a questionnaire gathers information about the various dimensions of the work system, including the tasks in the work system, organizational conditions, environmental issues, tools, technologies and individual characteristics (12).

Organization Diagnosis Questionnaire (ODQ) was designed by Preziosi based on the Six-Dimensional Weisbord's model (13); the six components of purpose, structure, relationships, rewards, leadership, and helpful mechanisms

are derived from the Weisboard's model. The only difference with the mentioned model is adding the "Attitude on Change" component to increase the comprehensiveness of the model to the questionnaire. The purpose of this questionnaire is to provide the appropriate data for extensive pathology and can be applied along with other techniques such as observation and interview to identify the strengths and weaknesses of the organization, also provides appropriate feedback resulted from the collected data in order to better diagnosis of the organization (14). This tool has been utilized in organizations in the fields of university (3), sport (15), healthcare (16), service (17), and police (18), but no reports are available in industrial organizations.

#### **Aims of the study:**

This study was aimed to evaluate the psychometric characteristics of Organizational Diagnosis Questionnaire (ODQ) in manufacturing industry in Hamedan province in Iran, 2016.

#### **Materials & Methods**

This analytical study was conducted among 397 employees who were selected by random sampling. The ODQ questionnaire has a total of 35 questions, which consists of seven factors, purpose, structure, relationships, leadership, rewards, helpful mechanisms, and attitudes toward change, and also each factor includes five questions. Responses are also designed in the form of a seven-choice Likert range (strongly agree (7) to strongly disagree (1)); and score 4 indicates a neutral state, and a higher score indicates problem in organizational performance, and score 1 represents optimal performance (19). Initially, the questionnaire was translated to Persian language by the relevant experts along with English expert. After obtaining a unique translation based on the consensus of the experts, the text was translated into English by English fluent in Farsi and has been verified

through comparing with the original version. Then, it was approved in a panel of five experts, and in a preliminary study and through test-retest the validity of the tool was tested. In addition to the Organization Diagnosis Questionnaire, a questionnaire on demographic factors including age, sex, education, work experience, and Paterson's job performance questionnaire was used with four sub-scales of discipline, responsibility, work improvement and collaboration, whose validity and reliability were confirmed (20) and respondents were self-declaration and semi-supervised to answer questions.

#### **Analysis**

Analyzes regarding the validity and reliability of the ODQ were performed using the tests presented below through SPSS V20 and LISREL V8.5.

#### **Reliability**

ODQ's reliability was assessed applying internal consistency analysis using Cronbach's alpha test as well as construct/Composite reliability. Internal consistency reliability defines the consistency of the results delivered in a test, ensuring that the various items measuring the different constructs deliver consistent scores.

#### **Test-retest reliability**

The questionnaire was distributed in two weeks intervals between 30 employees and the correlation between the two rounds responses of individuals was measured.

#### **Validity**

##### **Convergent validity (CV)**

CV depicts the degree to which two measures of constructs that theoretically should be related are in fact related. Convergent validity is a subtype of construct validity (21). There are two critical point regards to CV evaluation. First, indicators loading for each of the latent variables must be greater than 0.5. Second, the Average Variance Extracted (AVE) must be greater than 0.5. Second criterion is a statistic

shows that how much variance captured by the latent variable in a structural equation model which, is shared among other variables. AVE for a latent variable is sum of squares for the indicators loading on the latent variable divided by the number of the questions of the hidden variable.

**Confirmatory Factor Analysis (CFA)**

This kind of FA was used to examine if it measures of the questionnaire were consistent with a researcher's understanding of the nature of that factor/construct. Investigation and confirmation of the seven factors model of the tool was verified using LISREL V8.5.

**Results**

Totally, 321 valid questionnaires were used in the analysis process. Single male and married female were as 234 (72.9%) and 242 (75.4%) respectively.

The least of them had an upper secondary education (9.9%) and most of them had a bachelor's or higher degree (49.4%). The age of the participants was 34.07±7.65 (range 21 to 60) and their working experience was 8.74±7.31 years. Table 1 provides descriptive information.

**Table 1) Data about workers' education level and shift working**

Variable (N)	Frequency (%)
<b>Education level (314)</b>	Up to diploma 59 18.8
	Diploma 69 22.0
	Associate's degree 31 9.9
	Bachelor and higher 155 49.4
<b>Shift Working (311)</b>	Yes 121 38.9
	No 190 61.1

The mean and standard deviations of the subscales of ODQ as well as each of the 35 questions are presented in Table 2.

**Reliability**

The reliability of the tool was calculated by internal correlation and the Cronbach's alpha value of all questions was obtained 0.96. The alpha was calculated for each of the seven factors and varied between 0.69 (relationships) and 0.81 (rewards), which is depicted in Table 2. The reliability of the questionnaire was

measured by test-retest in a two-week intervals and the correlation coefficient was 0.89.

**Convergent Validity**

In this questionnaire, all factors' loads were higher than 0.5, except for questions 10 (from the rewards section) and 28 (from the attitude toward change). As well, convergent validity for this questionnaire was obtained using this hypothesis that the higher questionnaire score, the lower the job performance. Therefore, the correlation between ODQ score and job performance score were tested and significantly reverse-related (P=-0.22, p<0.001).

**Table 2) Mean, Standard Deviation and Cronbach's alpha**

Questions	Mean	SD	Internal consistency
<b>Q1</b>	2.7	1.4	
<b>Q8</b>	2.8	1.5	
<b>Q15</b>	2.6	1.4	
<b>Q22</b>	3.2	1.5	
<b>Q29</b>	3.2	1.5	
<b>Purposes</b>	2.9	1.08	0.77
<b>Q2</b>	3.1	1.5	
<b>Q9</b>	3.2	1.5	
<b>Q16</b>	3.4	1.7	



Q23	3.3	1.6	
Q30	2.9	1.5	
Structure	3.2	1.1	0.78
Q3	2.9	1.6	
Q10	3.04	1.6	
Q17	2.8	1.6	
Q24	2.8	1.5	
Q31	2.8	1.5	
Leadership	2.9	1.2	0.69
Q4	2.8	1.6	
Q11	3.4	1.7	
Q18	2.3	1.3	
Q25	2.5	1.3	
Q32	3.6	1.5	
Relationships	2.9	1.07	0.73
Q5	3.4	1.8	
Q12	4.3	2.08	
Q19	3.6	1.8	
Q26	4.3	1.9	
Q33	3.8	1.7	
Rewards	3.9	1.4	0.81
Q6	3.03	1.5	
Q13	2.9	1.5	
Q20	3.3	1.5	
Q27	3.6	1.7	
Q34	3.04	1.6	
Helpful Mechanisms	3.2	1.1	0.76
Q7	3.4	1.6	
Q14	3.07	1.5	
Q21	3.4	1.7	
Q28	2.7	1.4	
Q35	3.04	1.7	
Attitude Toward Change	3.1	1.1	0.78
Total OD	3.1	1.08	0.96

The correlation coefficient between subscales of two questionnaires was also obtained, and findings depicted reverse correlation between them ( $P < 0.001$ ). So, the above hypothesis was confirmed and ODQ had a desirable convergent validity (Table 3).

Factors	Discipline	Responsibility	Work	Collaboration	Job
Purposes	-0.239	-0.191	-0.175	-0.197	-0.224
Structure	-0.234	-0.128	-0.118	-0.136	-0.155
Leadership	-0.298	-0.265	-0.231	-0.195	-0.278
Relationships	-0.255	-0.202	-0.223	-0.205	-0.240
Rewards	-0.101	-0.009	-0.013	-0.098	-0.059
Helpful Mechanisms	-0.184	-0.166	-0.165	-0.178	-0.195
Attitude Toward	-0.237	-0.187	-0.197	-0.231	-0.237
OD	-0.224	-0.177	-0.186	-0.194	-0.220

**Table 3) Inter-correlations among Studied Variables**

**Table 4) Confirmatory Factor Analysis Results**

Model	$\chi^2$	df	$\chi^2 / df$	RMSEA	SRMR	CFI	NFI
7-factor	1554.8	539	2.8	0.08	0.07	0.95	<b>0.93</b>

### Confirmatory factor analysis

The present study also offered various fitness parameters: ratio, Comparative Fit Index (CFI), Standardized Root-Mean-Square Residual (SRMR), Root-Mean-Square Error of Approximation (RMSEA), Goodness of Fit Index (GFI) and Normed Fit Index (NFI). The ratio equals to 2.0 would be desirable. Also, CFI higher than 0.9 indicates a good fit. SRMR less than 0.08 and RMSEA 0.05 are acceptable (22). NFI defines zero models as a model that all correlations equal zero (23), and when it is more than 0.9 is acceptable (22). The results of the considered model in the CFA are presented in Table 4.

### Discussion

There are different ways to find out about organizations as complex phenomenon. Various models have been developed in the field of organization diagnosis to recognize the organizational structure, processes and culture status. The aim of this study was to evaluate the reliability and validity of the Persian version of Organization Diagnosis Questionnaire (ODQ) provided by Preziosi (1980) which was conducted among workers of industrial section in Iran. Total internal consistency reliability for ODQ was obtained to be equal to 0.96 using Cronbach's alpha test and compared to reference value of 0.7 that was considered appropriate (11).

Measured alpha was higher than one reported about Pakistanis version (24) (0.96 vs. 0.783). Also, it was more than another Persian version in educational organization (25) (0.96 vs. 0.9047). On the other hand, correlation coefficient between test and retest data depicted Persian version of ODQ has desirable stability

reliability (repeatability). As the tool's validity it should be said that CFA findings supported the model containing seven factors; it was in line with findings reported about Australian version (26). Results of convergent validity illustrated that all seven factors of ODQ were in relation with job performance and its sub-scales. Among all factors, leadership had the highest correlation with individual job performance (-0.278); it means the better organizational leadership is the better job performance by employees. Meanwhile, organization diagnosis had the highest correlation with discipline factor in job performance questionnaire (-0.227). It could be interpreted in this way that personnel would have higher discipline in their job when known their organization positive in different elements. Calculating ODQ's factors showed their means were between 2.9 to 3.9 that compared with past research in hotel industry were higher (4). More inherent complexity in industrial and production organization can be a reason for that outcome. But, findings were in line with that was reported by VatanKhah et al. in hospitals (16).

As it is obvious that all factors had a mean lower than 4, as neutral score, and were in acceptable level (19). However, rewards' mean (3.9) like Ahuja et al. (4), Afia and Usman (24) and Moghadam et al. (25) had the highest mean. It depicted that this factor was in a lower level comparison with other components and employees were not sure about the equitability of pay scale and benefits of the organization, existence of the opportunity for promotion in the organization, being the salary commensurate with the job that was performed, and totally about essential incentives to do the works. Only two questions had scores higher

than 4 and both were located in rewards section: The pay scale and benefits of this organization treat each employee equitably (Q12). The salary that I receive is commensurate with the job that I perform (Q26).

It is evidence that studied people were not satisfied about payment system of the organization. It must be noted that salary and financial issues, as one of the critical factors in motivational hierarchy in different models such as Maslow's, has a key role in job performance. So, weakness in this field would lead to reduction in their performance quality especially in long term. Motivational factors such as job security and salary are among safety needs of people (26,27). Motivation at work is in relationship with job accidents and its promotion would enhance safety level of employees (28,29).

As a result, the organization's management system should pay more attention to its reward policies. They were in alarming level. Ineffective payments policies would result to high levels of intention to turnover among personnel (24). As an action all policies, criteria, or any other organizational aspect that probably had effects on reward system of the organization and moved it to be ineffective should be under more studies to make it better. In addition, rewards incongruence with people input and output resulted in employees' poor motivation in the banking sector of Pakistan (30) and resulted in decline performance of Nigerian bankers (31). Three subscales of purposes, leadership and relationships had the lowest mean (2.9) that was in line with past researches (4, 24). So, respondents had opinion that organizations' goals were clearly mention and they understood it. Also, supportive role of supervisors and acceptable communication and relationship between supervisors and employees were confirmed. Stating organization's purposes and supervisors' goals more clearly and understandable, personnel' job

performance would be improved (32) and then some ergonomics and occupational health issues like work related musculoskeletal disorders (WRMSDs) would decrease (33). Findings of this part was against what was reported about hospitals that rewards had the lowest mean score and relationships, attitudes toward change and purposes had the highest scores respectively (16). Inter personnel relationships and supervisory manner in the workplace could result in occupational accidents occurrence by affecting on employees' safety behavior (34). Along with reduction in work related accidents, turnover intention would decrease if relationships, supervisory and leadership in organization especially in the realm of safety get better (35). Goals clarity has positive effects on organization health and therefore employees' health (36). On the other hand, ambiguity was related to job tension, lower satisfaction and lower self-confidence (37-39). Since, respects to the finding of the present study, the organization was in acceptable condition and it could help to personnel safety improvement.

### Conclusion

The results of this study supported the reliability and validity of the Persian version of ODQ in industrial organization and it can be applied as a fit tool to recognize about internal conditions of Persian language industrial organizations. However, it was revealed that reward system in the organization especially in the equality of performance and payment had problems so, needs precise studies to recognize more about its causes. This questionnaire can be used as an effective tool in macroergonomics studies and helps managers and decision makers of occupational health and safety to find more about organizational factors affecting on such safety performance e.g. reduction in occupational accidents and its

costs, employees' health and welfare promotion.

## Footnotes

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### Conflict of Interest:

The authors declared no conflict of interest.

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