# Designing key performance indicators (KPIs) for decent work in the pharmaceutical supply chain of Iran

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| CHRONICLE | ABSTRACT |
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| | While decent work has emerged as the central theme of the psychology of work theory and a global concept and directive for promoting social, political, and economic justice, it has garnered increasing scientific and political attention in the past two decades. However, until now, no defined measurement scale for the pharmaceutical supply chain exists. The present study aims to design and validate key performance indicators (KPIs) for 'decent work' in the pharmaceutical industry supply chain of Iran, using the Decent Work Daffi Scale (2017) as a reliable framework with five sub-scales and 15 items, tested and validated. For the validation of the Decent Work Scale, a quantitative survey study was conducted among selected pharmaceutical industry experts with a sample size of 228 individuals in the year 2023. The current study adopted an exploratory factor analysis approach using SPSS software and a confirmatory factor analysis through AMOS version 24 software. In this context, the factor structure, convergent validity, discriminant validity, and Cronbach's alpha coefficients were examined. The results showed that the five-factor structure outperforms the one-factor model with evidence supporting the convergent, discriminant, and predictive validity of the five-factor scale. Thus, the measurement of decent work in the pharmaceutical industry of Iran comprises five sub-scales: occupational safety conditions, access to healthcare, adequate remuneration, Free time and rest, and alignment of organizational values with family and societal values. This scale can serve as a useful tool for industrial and organizational psychology research, as well as for studies on the sustainability of social supply chains. |
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## 1. Introduction

Supply chains are one of the most critical drivers of businesses, and in recent decades, with the emergence of the concept of sustainability, companies have been motivated even more to achieve sustainable development goals (Zimon et al., 2020). While the economic and environmental aspects of supply chains are undeniable (Cai & Choi, 2020), there has been a growing emphasis on considering social dimensions and humanizing supply chains in recent studies (Soundararajan et al., 2021; Aguiñaga & Leal, 2021; Rai et al., 2019). Managing working conditions in supply chains has become a compelling subject in both research and supply chain operations. However, up until now, the focus has primarily been on auditing suppliers and adhering to supply chain ethical codes, with a lack of effective guidelines and general regulations (Reinecke & Donaghey, 2021). In contrast, decent work has gained significant scientific and political attention as a vital concept and global directive for promoting justice in social, political, and economic development over the past 20 years (Silva, 2021), and supply chains in various industries are no exception to this rule (Aguiñaga & Leal, 2021). In 1999, the International Labour Organization (ILO) introduced the term "decent work" as an initiative to ensure dignified employment, providing a safe, stable, and joyful life for all workers (Ma et al., 2023). Nowadays, the concept of decent work has become an intriguing scientific subject for studying the psychological impact of work to motivate employees in organizational settings (Su et al.,

2022). Decent work directly addresses the satisfaction of basic human needs and, in turn, contributes to the overall well-being (Dodd et al., 2019). The Decent Work Declaration recognizes the role of work and related areas in giving meaning, offering development and growth opportunities to employees who eagerly engage in their work (Sanhokwe & Takawira, 2021). The concept of decent work, within the framework of work psychology theory, provides a lens to address interindividual barriers or factors to enhance equal access to work (Su et al., 2022), and recently, there is a growing interest in empirical studies within professional psychology to understand the antecedents and outcomes of decent work (Ma et al., 2023).

With a focus on assessing working conditions, the psychological perspective laid the foundation for conceptualizing and operationalizing decent work by Daffi and colleagues (2016, 2017), offering insights into psychological-social perspectives with interpersonal relationship features (Rossier and Ouedraogo, 2021; Seubert et al., 2021). The Decent Work Scale (DWS) is a metric commonly used by organizations to measure important aspects of decent work (Sanhokwe & Takawira, 2021). However, limited research has examined the measurement model's quality of the Decent Work Scale (DWS) in developing countries (Sanhokwe & Takawira, 2021), and more studies have been dedicated to developed countries.

In a research, five key factors of decent work were introduced as essential measurement components in the United States, including safe working conditions (e.g., absence of physical, mental, or emotional abuse), sufficient time and rest breaks, access to healthcare, adequate compensation, and alignment and congruence between organizational, family, and societal values (Ma et al., 2023; Duffy et al., 2016). In another study, the Decent Work Scale (DWS) was developed to assess this construct better and subsequently applied in various countries, such as Switzerland (Masdonati et al., 2019), Portugal (Ferreira et al., 2019), the United Kingdom (Dodd et al., 2019), Italy (Di Fabio & Kenny, 2019), and France (Vignoli et al., 2020). While the concept of decent work originated in Western societies, it has been addressed in various Asian countries since the early 2000s, including China (Cooke et al., 2019; Yang et al., 2019), Hong Kong (Su et al., 2022), and South Korea (Nam & Kim, 2019). Due to the emphasis on decent work in developed countries and diverse industries, its measurement scales have been applied to the fisheries supply chain in India (Rajeev, M & Bhandarkar, 2022), and the importance of decent work and digitization in the pharmaceutical industry (Griffin, 2018) and pharmaceutical supply chain with a human-centric approach (Gobbi, 2022) has been studied. Researchers have proposed that worker-centric governance in supply chains can contribute to achieving decent work through democratic participation of workers and their representatives in supply chain governance systems (Reinecke & Donaghey, 2021). Others emphasize a humanistic supply chain management approach to promote responsible production and enhance green innovations within the supply chain through the use of the Decent Work Scale and worker participation (Aguiñaga, E., & Leal, 2021). However, despite scientific papers presenting decent work measurement scales (Chen et al., 2020; Ma et al., 2020b; Ma et al., 2020c; Wang et al., 2019), no known study has explicitly validated the Decent Work Scale within the pharmaceutical supply chain. Furthermore, there is growing concern for investigating decent work in supply chains (Rajeev, M & Bhandarkar, 2022; Reinecke & Donaghey, 2021), and understanding and studying these concerns can guide pharmaceutical supply chains towards sustainable development goals (Gobbi, 2022; Griffin, 2018). The research path to explore working conditions in supply chains based on decent work is still considered underdeveloped, requiring further qualitative and quantitative examination (Soundararajan et al., 2021). Therefore, this study was conducted with the aim of designing and validating the Decent Work Scale in the pharmaceutical industry supply chains of Iran.

## 2. literature review

### 2.1 Defenition of Decent work

The term "decent work" was first introduced by the International Labour Organization (ILO) in 1999 as a reference for evaluating working conditions at a macro level, covering topics such as labor unions, occupational safety, legal protection for workers, social security availability, and more (Su et al., 2022). Decent work has a multidimensional nature and aims to create a fairer economic space where all workers can enjoy job security, freedom, dignity, and social justice (Bob, 2020). According to the ILO's definition, decent work is perceived as quality work that includes safe working conditions, fair wages, adequate health insurance, sufficient leave, and alignment with family values (Wei et al., 2022).

The Psychological Theory of Work (PWT) considers decent work as a fundamental concept in a broad social context and analyzes and examines human development from the perspective of social class and economic status (Duffy et al., 2016; Ribeiro et al., 2019). Therefore, the current research framework is based on the Psychological Theory of Work.

### 2.2 Dimensions of assessing decent work

Until 2016, there was no tool that could comprehensively assess and measure all dimensions of decent work from a psychological perspective. However, Duffy and colleagues (2016, 2017) decided to develop such a tool and design a valid measurement scale. Based on the psychological perspective of work, they created the Decent Work Scale (DWS) consisting of five factors: Safe working conditions, access to healthcare, adequate compensation, Free time and rest, and organizational values aligned with family and societal values (Wan & Duffy, 2022; Ferreira et al., 2019; Su et al., 2022).

1- Safe and Interpersonal Working Conditions: This dimension includes a legal framework for managing the physical, environmental, and psychological aspects of the work environment, such as safety and health measures (Jamea & Rabbani, 2020).

2- Access to Healthcare: In organizations, there is a strong relationship between economic activity, healthcare, and access to healthcare facilities (Corsi et al., 2019). Having adequate healthcare facilities in organizations can have an impact on the job performance of employees. Organizations that provide an environment with minimum healthcare facilities observe higher job performance from their employees (Abedini Velamdehy, 2021).

3- Adequate Compensation: Adequate compensation means that organizations provide their employees with income that allows them to meet their living expenses in the face of changing environmental conditions. Employees seek jobs where their wages and earnings align with their expertise and efficiency (Cram et al., 2017).

4- Free time and rest: Recent studies on work-life balance have reported positive attitudes from employees. Research has shown that managerial positions have less Free time and rest compared to operational levels, as managers are constantly engaged in organizational decision-making (Abedini Velamdehy, 2021).

5- Alignment of Organizational Values with Family and Social Values: Complementary values refer to employees' interest in joining an organization where their personal priorities and actions align with organizational priorities (Abedini Velamdehy, 2021).

While the framework proposed by Duffy et al. (2017) provides a useful tool for evaluating decent work and some recent empirical studies (Di Fabio and Kenny, 2019; Masdonati et al., 2019; Ribeiro et al., 2019; Vignoli et al., 2020) have confirmed the significance of Duffy's five dimensions through quantitative findings, the development of conceptualization and operationalization of decent work and its capacity building in promoting positive work outcomes and widespread employment in various industries is still evolving (Ferraro et al., 2018; Seubert et al., 2021). The present study focuses on the pharmaceutical supply chain in Iran to provide a standardized basis for measuring and promoting locally adapted decent work.

### 2.3 Background of Empirical Research

In Table 1, a review of previous research related to the measurement and assessment of decent work in various societies is presented.

**Table 1**
A review of previous research related to the measurement and assessment of decent work

| Authors | year | Research objective | Fundings |
| --- | --- | --- | --- |
| Ma et al. | 2023 | Redesign and validation of the Decent Work Scale in China | Five factors including safe working conditions, access to healthcare, adequate compensation, time and rest, and value congruence were identified, and it was shown that the proposed scale has high validity. |
| Lee et al. | 2023 | Validation of the measurement scale of decent work and investigation of the relationship between decent work and work engagement | Decent work has a positive relationship with work engagement. However, three of the indicators are very similar to another indicator in the same dimension, meaning that these indicators are not able to differentiate between individual characteristics effectively |
| Su et al. | 2022 | Design and validation of a scale for measuring decent work with a social cognition component among social workers in Hong Kong | Decent work, along with the sub-scale of social cognition and the indicators of job demands, job resources, and work engagement, is positively correlated. The results of extracted analysis of variance indicate the discriminant validity of the 6-factor scale of decent work along with social cognition |
| Sanhokwe & Takawira | 2022 | Multidimensional Structure of the Decent Work Scale (DWS) through Two-Factor Modeling | The Predictive Validity of the Decent Work Scale: Confirmatory Factor Analysis Using Covariance-Based Structural Modeling is Supported, and Two-Factor Analysis Remains Consistent across Gender Groups. Moreover, Decent Work Shows a Positive and Significant Relationship with Organizational Learning and Work Participation |
| Işık et al. | 2019 | Psychometric Properties of the Turkish Version of the Decent Work Scale (DWS) | The Two-Factor Model of the Five Components Demonstrates the Best Fit with the Data. The Proposed Structure Remains Consistent Across Gender, Income, and Socioeconomic Groups |
| Ferraro et al. | 2018 | Assessment of Decent Work with Development and Validation in Two Samples of Knowledge Workers | Exploratory and Confirmatory Factor Analyses, Convergent and Discriminant Validity, and Desirable Reliability Coefficients were used to develop a reference version for the concept of Decent Work, which can be utilized at an individual analysis level |

Based on the presented empirical background, researchers have made significant progress in the domain of decent work, using various approaches, tools, and analytical methods. Decent work has been developed in Western cultural contexts such as Switzerland (Masdonati et al., 2019), Portugal (Ferreira et al., 2019), England (Dodd et al., 2019), Italy (Di Fabio &

Kenny, 2019), and France (Vignoli et al., 2020). It has also been studied in different Asian countries, including China (Cooke et al., 2019; Yang et al., 2019), Hong Kong (Su et al., 2022), and South Korea (Nam & Kim, 2019).

On the other hand, most of the studies on the Decent Work Scale (DWS) are based on the version provided by Duffy and colleagues (2017). However, there is no standardized scale for Iran, particularly in the pharmaceutical supply chain and logistics industry. From another perspective, the individual-level measurement of decent work lacks a rich literature, and this study helps fill the theoretical gap by providing a tested and validated framework for the pharmaceutical industry cluster in Iran. Fig. 1 represents the Decent Work Scale used in the current study, which has been previously validated by Duffy and colleagues (2017).
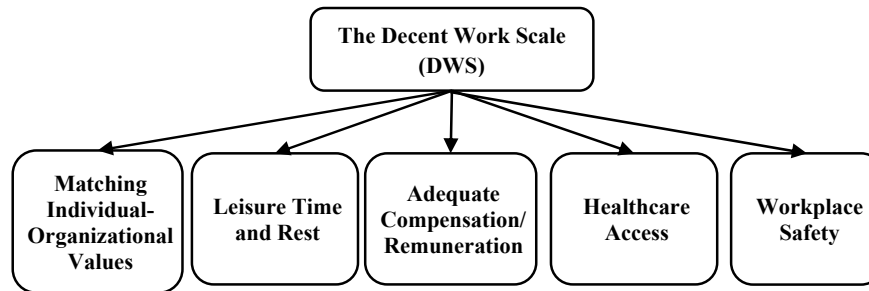


**Fig. 1.** Assessment Model of Decent Work in the Pharmaceutical Industry based on the Daffy et al. (2017) Scale.

## 3. Research methodology

The research population includes all supply chain experts of Razi Pharmaceutical Company in Tehran, which consists of a total of 557 individuals according to the received statistics. Out of the population, 228 individuals were selected using the probability-based cluster random sampling method, based on the Cochran formula. First, a list of all experts related to the fields of raw material suppliers, drug manufacturers, wholesale drug distributors, and retail pharmacies was prepared. Then, individuals were randomly selected from each cluster based on the frequency of each cluster. The inclusion criteria for participants in the study were full satisfaction, voluntary participation, and accuracy in answering the questions. The exclusion criteria were incomplete responses in less than 95% of the questions and bias in answering the questions.

The current study utilizes the Decent Work Scale (DWS), which consists of five subscales: Safe Working Conditions, Access to Healthcare, Adequate Compensation, Leisure Time and Rest, and Alignment of Organizational, Family, and Community Values. Each subscale comprises three items, resulting in a total of 15 items for the entire Decent Work Scale. The DWS was developed based on the validated tool by Duffy (2016, 2017), and respondents rate each item on a seven-point Likert scale ranging from 1 (completely disagree) to 7 (completely agree).

Sample questions for each subscale include: "I feel emotionally secure in my interactions with people at work", "I receive satisfactory health benefits from my job", "I am fairly compensated for my work", "I have sufficient time for non-work activities", and "The values promoted by my organization align with my family values". The questionnaire's items were randomly ordered to minimize response bias, a common issue in surveys. Four out of the 15 questions were designed with reverse phrasing, and their scores were appropriately reversed during data analysis.

The subscales' internal consistency, as measured by Cronbach's alpha, was found to be satisfactory in the current study: Safe Working Conditions ($\alpha = 0.78$), Access to Healthcare ($\alpha = 0.81$), Adequate Compensation ($\alpha = 0.85$), Leisure Time and Rest ($\alpha = 0.79$), and Alignment of Organizational, Family, and Community Values ($\alpha = 0.76$).

In this study, 35% of the initial responses were randomly selected for Exploratory Factor Analysis (EFA), while the remaining 65% were used for Confirmatory Factor Analysis (CFA) (Kline, 2015). EFA was conducted using SPSS version 26, and CFA was performed using structural equation modeling based on AMOS software with the maximum likelihood method.

## 4. Results

Table 2 presents descriptive information about the demographic characteristics of the study sample.

**Table 2**
Descriptive information about the demographic characteristics

| Demographic characteristics | | Frequency and percentage of study in the pharmaceutical supply chain | | | | |
|---|---|---|---|---|---|---|
| | | Supplier | Producer | Distributor | Retailor | Total |
| **Gender** | Male | 30 (13%) | 42 (18%) | 44 (19%) | 29 (13%) | 145 (64%) |
| | Female | 15 (7%) | 22 (10%) | 28 (12%) | 18 (8%) | 83 (36%) |
| | Total | 45 (20%) | 64 (28%) | 72 (32%) | 47 (21%) | 228 (100%) |
| **Age group** | Under 30 | 8 (4%) | 10 (4%) | 11 (5%) | 17 (7%) | 46 (20%) |
| | Between 30 and 40 | 20 (9%) | 18 (8%) | 17 (7%) | 33 (14%) | 88 (39%) |
| | Between 40 and 50 | 14 (6%) | 10 (4%) | 21 (9%) | 9 (4%) | 54 (24%) |
| | Over 50 | 8 (4%) | 11 (5%) | 14 (6%) | 7 (3%) | 40 (18%) |
| | Total | 50 (22%) | 49 (21%) | 63 (28%) | 66 (29%) | 228 (100%) |
| **Level of education** | Associate's degree and | 2 (1%) | 1 (0.5%) | 1 (0.5%) | 2 (1%) | 6 (3%) |
| | Bachelor' | 38 (17%) | 21 (9%) | 17 (7%) | 41 (18%) | 117 (51%) |
| | Master | 9 (4%) | 25 (11%) | 5 (2%) | 26 (11%) | 65 (29%) |
| | PhD | 3 (1%) | 14 (6%) | 2 (1%) | 21 (9%) | 40 (18%) |
| | Total | 52 (23%) | 61 (27%) | 25 (11%) | 90 (39%) | 228 (100%) |
| **Occupation** | Senior manager | 5 (2%) | 4 (2%) | 3 (1%) | 2 (1%) | 14 (6%) |
| | Middle manager | 8 (4%) | 6 (3%) | 8 (4%) | 4 (2%) | 26 (11%) |
| | Operation manager | 23 (1%) | 28 (12%) | 17 (7%) | 13 (6%) | 81 (36%) |
| | Marketing expert | 7 (3%) | 25 (11%) | 10 (4%) | 22 (1%) | 64 (28%) |
| | Sale expert | 8 (4%) | 11 (5%) | 6 (3%) | 18 (8%) | 43 (19%) |
| | Total | 51 (22%) | 74 (32%) | 44 (19%) | 59 (26%) | 228 (100%) |

The descriptive findings for each of the subscales and their items, including the mean, standard deviation, skewness, and kurtosis, are presented in Table 3.

**Table 3**
Descriptive information of the subscales and their mesures

| Number | Question | Average | Standard deviation | Skewness | kurtosis |
|---|---|---|---|---|---|
| 1 | I feel emotional security from interacting with people in my workplace | 3.96 | 0.521 | -1.325 | 1.788 |
| 2 | At my workplace, I feel safe from any kind of emotional or verbal harassment | 4.04 | 0.714 | -1.249 | 1.187 |
| 3 | I feel physically safe from any interactions with people at my workplace | 3.36 | 1.038 | -0.585 | -0.975 |
| Safe Working Conditions | | 3.785 | 0.6035 | -1.152 | 1.189 |
| 4 | I receive good healthcare benefits at my workplace | 3.18 | 1.277 | 0.136 | -1.586 |
| 5 | I have good healthcare programs at my workplace | 3.63 | 0.874 | -0.955 | 0.951 |
| 6 | At my workplace, acceptable options for healthcare have been provided | 3.61 | 0.901 | -0.423 | -0.593 |
| Access to healthcare | | 3.473 | 0.8742 | -0.270 | -0.818 |
| 7 | I am not receiving a fair salary for the work I am doing. (R) | 3.56 | 0.962 | -0.447 | -0.849 |
| 8 | I feel that I am not receiving sufficient compensation based on my qualifications and experience. (R) | 3.50 | 0.912 | -0.443 | -0.803 |
| 9 | I receive sufficient rewards for my work. | 3.63 | 0.788 | -1.204 | 0.350 |
| Adequate compensation | | 3.561 | 0.7415 | -0.631 | -0.057 |
| 10 | I do not have enough time for my non-work activities (R) | 3.19 | 0.773 | 0.115 | -0.499 |
| 11 | I do not have time to rest during the workweek (R) | 3.33 | 0.920 | 0.052 | -0.888 |
| 12 | I have free time for recreation during the workweek | 3.35 | 0.933 | -0.251 | -1.113 |
| Free time and rest | | 3.289 | 0.7476 | -0.352 | -0.901 |
| 13 | The values of my organization align with my family values | 3.39 | 0.865 | -0.590 | -1.011 |
| 14 | The values of my organization are in harmony with my family values | 3.43 | 1.024 | -0.194 | -1.190 |
| 15 | The values of my organization are aligned with societal values | 3.22 | 0.992 | -0.462 | -1.053 |
| Complementrary values | | 3.346 | 0.8784 | -0.553 | -1.406 |
| **The entire questionnaire (Decent work)** | | **3.491** | **0.6487** | **-0.403** | **-0.448** |

The results presented in Table 3 indicate that the highest mean scores are related to question number 2, and the lowest mean score is related to question number 4. Furthermore, the results show that the highest dispersion (standard deviation) is related to question number 4, and the lowest dispersion is related to question number 2. Additionally, the descriptive statistics show that the absolute values of skewness and kurtosis coefficients for all questions and subscales are less than 2, indicating that the data are normally distributed. Therefore, the data are suitable for confirmatory and exploratory factor analysis. Exploratory factor analysis was performed on 35% of the sample responses (n = 80) using SPSS version 26 software. As a

prerequisite for exploratory factor analysis and to assess the adequacy of sampling, the Kaiser-Meyer-Olkin (KMO) test and Bartlett's sphericity test were conducted, and the results are shown in Table (4).

**Table 4**
Kaiser-Meyer-Olkin (KMO) Test and Bartlett's Test.

| Test KMO | Bartlett's Test of Sphericity | Degrees of freedom | P value |
|---|---|---|---|
| 772.0 | 625.323 | 105 | 000.0 |

Based on the information in Table 4, the Kaiser-Meyer-Olkin (KMO) value is 0.772, and the Bartlett's test of sphericity is significant with a value of 323.625 ($p < 0.01$). Therefore, considering the high KMO value and the significance of Bartlett's test, the collected data from 35% of the sample (n = 80) are appropriate and sufficient for conducting exploratory factor analysis. Before performing exploratory factor analysis, the criteria for determining the number of factors (subscales) include eigenvalues greater than 1, as demonstrated in the scree plot (Fig. 2). Additionally, the acceptance criterion for the exploratory factor loadings is values greater than 0.30. Furthermore, the cross-loadings of items on multiple factors were examined to identify items that load significantly higher on more than one factor (loading > 0.30).
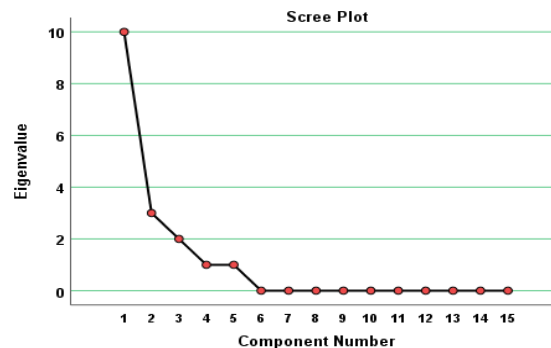


**Fig. 2.** Scree plot for exploratory factor analysis of the Decent Work Scale

Table 5 presents the information related to the extracted factors from exploratory factor analysis, including the eigenvalues for each factor, the amount of variance explained by the factors, and factor loadings of the items. The results indicate that the eigenvalues for the five factors are higher than 1, and these five factors account for approximately 74.839% of the total variance of the Decent Work Scale. Additionally, the steepness of the scree plot also confirms the extraction of five factors, suggesting that the five-factor structure can best fit the research data with the theoretical structure of the Decent Work Scale.

**Table 5**
Identified Factors, Factor Characteristics, and Factor Loadings of Items in Exploratory Factor Analysis

| The values examined in the exploratory factor analysis | Factor 1: Safe Working Conditions | Factor 2: Access to Health Care | Factor 3: Adequate Compensation | Factor 4: Free time and rest | Factor 5: Complementrary values |
|---|---|---|---|---|---|
| Factor eigenvalue | 10.783 | 3.082 | 2.290 | 1.930 | 1.372 |
| $R^2$ percentage | 41.474 | 11.852 | 8.808 | 7.723 | 5.279 |
| Reliability (Cronbach's alpha coefficient) | 0.924 | 0.929 | 0.900 | 0.905 | 0.940 |
| Question 1 | 0.764 | | | | |
| Question 2 | 0.858 | | | | |
| Question 3 | 0.747 | | | | |
| Question 4 | | 0.832 | | | |
| Question 5 | | 0.731 | | | |
| Question 6 | | 0.711 | | | |
| Question 7 | | | 0.704 | | |
| Question 8 | | | 0.686 | | |
| Question 9 | | | 0.617 | | |
| Question 10 | | | | 0.830 | |
| Question 11 | | | | 0.752 | |
| Question 12 | | | | 0.707 | |
| Question 13 | | | | | 0.620 |
| Question 14 | | | | | 0.617 |
| Question 15 | | | | | 0.612 |
| Percentage of $R^2$: 74.839 | | | | | |

The findings indicate that the five extracted factors form a cohesive and unified structure. Additionally, the factor loadings of the items in each subscale are high, and similar to the Decent Work Scale by Dafi and colleagues (2017), each of the three items describes its corresponding subscale. In other words, all the factor loadings of the items on their respective factor have obtained coefficients greater than 0.3.

To examine whether the five factors obtained from the exploratory factor analysis can be replicated, 65% of the remaining data (148 = n) were used for cross-validation using maximum likelihood covariance estimation. For this purpose, both a one-factor model and a five-factor model were run in the software. In the one-factor model, all items were grouped under one factor (Decent Work). In the five-factor model, three items were considered for each of the subscales of Safe Working Conditions, Access to Health Care, Adequate Compensation, Leisure and Rest, and Alignment of Organizational Values.

To evaluate the one-factor and five-factor models, the chi-square ($\chi^2$) test, Comparative Fit Index (CFI), Incremental Fit Index (IFI), Standardized Root Mean Square Residual (SRMR), and Root Mean Square Error of Approximation (RMSEA) were examined. Table 6 displays the fit indices for the confirmatory factor analysis of the one-factor and five-factor models of the Decent Work Scale.

**Table 6**
Fit Indices for Confirmatory Factor Analysis of One-Factor and Five-Factor Models of Decent Work Scale

|  | ($\chi^2$) | (df) | df / $\chi^2$ | IFI | CFI | SRMR | RMSEA |
|---|---|---|---|---|---|---|---|
| Acceptable range | - | - | < 3 | < 0.9 | < 0.9 | 0.1 < | 0.1 < |
| Single-factor model | 335.71 | 97 | 3.46 | 0.67 | 0.58 | 0.137 | 0.206 |
| Five-factor model | 152.91 | 89 | 1.72 | 0.91 | 0.89 | 0.075 | 0.081 |

As the results in Table 6 demonstrate, most of the fit indices for the one-factor model are weak, indicating that the one-factor model needs modification. Specifically, the values of IFI, CFI, and RMSEA in this model are far from acceptable thresholds for fit; therefore, model adjustments were made using AMOS software. These adjustments revealed significant covariances between the error of item 6 with item 14, item 7 with item 9, and item 12 with item 15, and by including these covariances, the model will have a reasonable fit.

Fig. 3 illustrates the one-factor structure of the Decent Work Scale. As can be seen from Fig. 3, item 7 does not have a proper factor loading, as its factor loading is less than 0.3 and non-significant, while the rest of the items significantly load on the one-factor of Decent work. The highest factor loading is associated with item 5 with a loading of 0.81, and the smallest factor loading is linked to item 7 with a loading of 0.28. Since one item failed to obtain a desirable factor loading, it is not appropriate to consider the Decent Work Scale in the pharmaceutical industry as a one-factor model.
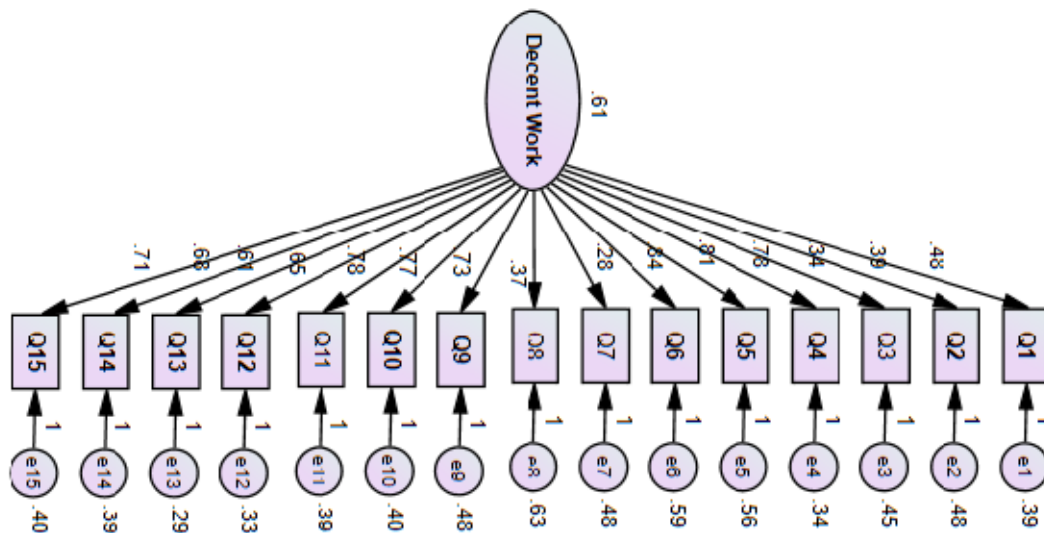


**Fig. 3.** Confirmatory Factor Analysis of the Single-Factor Model of Job Desirability in the Pharmaceutical Industry

Based on the study by Davy et al. (2017), three models (correlated factor model, higher-order factor model, and bifactor model) were evaluated. In the higher-order factor model, the items were loaded on the same five factors present in the correlated factor model, and each factor was also loaded on a higher-order factor of Decent work. In the bifactor model, the items were loaded both on the general Decent work factor and on the five separate subscale factors, allowing for more versatility in modeling. Therefore, in the current study, the five-factor structure of Decent work was computed using confirmatory factor analysis with the covariance-based approach, and the results in Table 6 indicate that the five-factor model based on the correlation between the subscales has a better fit, with IFI, CFI, and RMSEA values closer to the fit indices' criteria. Fig. 4 illustrates the five-factor structure of the Decent Work Scale, where the largest factor loading for the subscales is related to the Safe Working Conditions subscale (item 3 with a factor loading of 0.73), followed by the Access to Health Care subscale (item 5 with a factor loading of 0.75), Adequate Compensation subscale (item 8 with a factor loading of 0.83), Leisure and Rest subscale (item 11 with a factor loading of 0.84), and Complementray values subscale (item 13 with a factor loading of 0.86). Therefore, it can be interpreted that the Decent Work Scale in the pharmaceutical

industry of Iran consists of five independent factors: Safe Working Conditions, Access to Health Care, Adequate Compensation, Leisure and Rest, and Complementrary values.
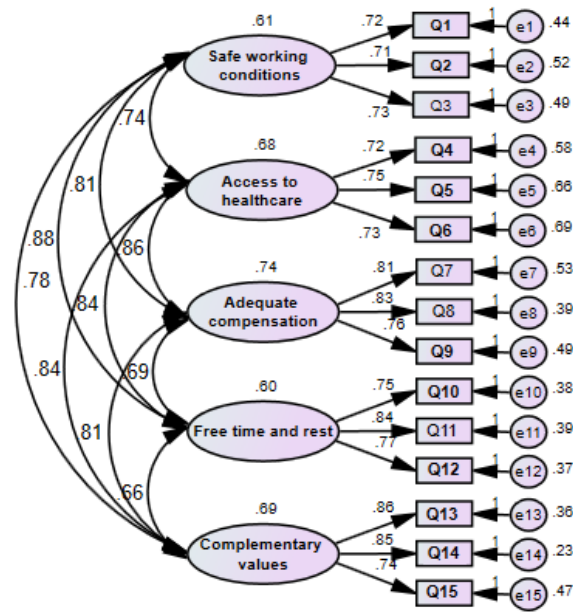


**Fig. 4.** Confirmatory Factor Analysis of the Modified Five-Factor Model for Job Desirability in the Pharmaceutical Industry

In continuation, to ensure that the five identified factors are distinct and not overlapping, discriminant validity between the two-factor models was examined. By comparing the single-factor and five-factor models using the difference in chi-square ($\Delta\chi^2$) and degrees of freedom (df) and their significance, it was determined that the chi-square and degrees of freedom for the single-factor model were 335.71 and 97, respectively, and for the five-factor model were 152.91 and 89, respectively. The reduction in the chi-square value and the decrease in the ratio of df/$\chi^2$ from 3.46 to 1.72 indicate the superiority of the five-factor model. Table 7 displays the correlation coefficients between Decent Work and its subscales, including Safe Working Conditions, Access to Health Care, Adequate Compensation, Free time and rest, and Complementrary values, Family, and Community Values.

**Table 7**
Correlation Coefficients and Composite Reliability (CR) of Job Desirability

| Subscales of Decent work | Sample | Correlation coefficient ($r^2$) | Composite Reliability (CR) | p-value |
|---|---|---|---|---|
| Safe working conditions | 148 | 0.61 | 0.811 | 0.0001 |
| Access to Health Care | 148 | 0.68 | 0.832 | 0.0001 |
| Adequate Compensation | 148 | 0.74 | 0.769 | 0.0001 |
| Free time and rest | 148 | 0.60 | 0.795 | 0.0001 |
| Complementrary values | 148 | 0.69 | 0.883 | 0.0001 |

As evident from the information in Table 7, Decent Work has a strong correlation with Safe Working Conditions (0.61), Access to Health Care (0.68), Adequate Compensation (0.74), Leisure and Rest (0.60), and Alignment with Organizational, Family, and Community Values (0.69), indicating significant convergence with the five identified factors. Finally, to assess the reliability of each of the current model's factors, the Composite Reliability (CR) index was utilized, and the results obtained from examining the composite reliability of the factors are presented in Table (8). The coefficients for these five factors range from 0.769 to 0.883, indicating desirable reliability for these factors.

**Table 8**
Correlations between Current Variables of the Decent Work Scale

| Subscales of Decent work | Safe working conditions | Access to Health Care | Adequate Compensation | Free time and rest | Complementrary values |
|---|---|---|---|---|---|
| Safe working conditions | 1 | | | | |
| Access to Health Care | 0.81 | 1 | | | |
| Adequate Compensation | 0.88 | 0.86 | 1 | | |
| Free time and rest | 0.84 | 0.84 | 0.69 | 1 | |
| Complementrary values | 0.78 | 0.84 | 0.81 | 0.66 | 1 |

## 5. Conclusion and Suggestions

### 5.1 Concusion

When Decent Work is measured as a single-factor model, it does not have a good fit. Additionally, in this situation, Question 7 has a weak factor loading (less than 0.3) and is not significant. However, in the five-factor model, Decent Work shows a good fit, and none of the items need to be removed; they even exhibit high factor loadings. Moreover, the five-factor structure based on confirmatory factor analysis and exploratory factor analysis has relatively desirable fit indices. Therefore, the Decent Work scale in the Iranian pharmaceutical industry, using the five-factor model proposed by Davy et al. (2017), demonstrates the necessary validity and reliability, and it can be used to measure this construct. This scale can have numerous applications in management research for the social sustainability of pharmaceutical supply chains, as well as in industrial and organizational psychology studies. It is recommended to use this scale in related research to enhance the richness of the findings.

The findings of this study can serve as a guiding tool for policymakers in providing sufficient conditions for Decent work. Furthermore, the results can contribute to expanding the concept of Decent work, offering new directions for improvement, creating Decent work conditions, providing important implications for the development of work psychology theory, and fostering a suitable environment to enhance workplace well-being. The results show that employees seek jobs with minimum basic facilities, and these standards may vary in each country and industrial context. However, according to the Decent Work scale, these standards can be classified into five categories: Safe Working Conditions, Access to Health Care, Adequate Compensation, Leisure and Rest, and Complementrary values

### 5.2 Suggestions

Pharmaceutical industry managers must ensure that their facilities and operations maintain safe working conditions for employees. This includes implementing appropriate safety protocols, providing necessary safety equipment, and addressing any occupational hazards related to their role in the supply chain. Additionally, they should strive to provide access to quality healthcare, including medical insurance coverage, regular medical check-ups, and necessary treatment, for their employees. They can collaborate with local healthcare providers or create employee health programs to enhance workforce well-being. Managers should also endeavor to offer Decent and competitive wages to their employees. Adequate compensation may include benefits such as retirement plans, performance bonuses, or profit-sharing programs based on the supplier's size and capacity. Furthermore, suppliers should implement policies that promote work-life balance for their employees. This may involve creating reasonable working hours and providing encouraging rest and leave policies

### 5.3 Limitations of the Study

There are several limitations in this study that should be addressed in future research. Firstly, a cross-sectional design was adopted, meaning that the data was collected at a specific time interval, and therefore, no causal relationships can be established among the variables. Secondly, there is a potential for single-method bias in the current study, whereas using mixed methods could enhance the richness of the Decent Work Scale.

In general, there are multiple directions for future research on Decent Work. Conducting longitudinal studies or experimental designs on Decent Work in future investigations could reveal causal inferences between variables. Future research could provide a more comprehensive and detailed description of the implications and outcomes of Decent Work by employing qualitative or mixed-method approaches and utilizing field surveys or in-depth interviews. Additionally, selecting larger and more diverse samples could be considered in future research endeavors.

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