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Research article

Multidimensional motivation scale for community health workers: Psychometric properties and validation in a Turkish population

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ABSTRACT

Aim: The aim of this study was to adapt the Multidimensional Motivation Scale for Community Health Workers (MCHW) developed by Gottert et al. (2021) to the Turkish population and to test its validity of inferences and reliability of scores.

Method: The study was completed by 220 health personnel serving in the field of public health. Data were collected face-to-face using the Descriptive Information Form and Multidimensional Motivation Scale for Community Health Workers. Exploratory factor analysis (EFA) was used to identify the motivation factors and confirmatory factor analysis (CFA) was then used to certify the elementary factors produced by EFA using Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR).

Results: After EFA and CFA, a 21-item scale with 4 factors (Quality of supervision, feeling valued and competent, peer respect and support, compensation and workload) was identified with fit index values that were acceptable. Cronbach's α value was found between 0.78 and 0.92 for the sub-dimensions of the study and α = 0.92 for the whole scale (>0.70). In the EFA with 21 items, the Kaiser–Meyer–Olkin value was 0.901, and the Barlett test result was 3385.63 ($p < .000$). In the test-retest analysis, no significant difference ($p > 0.05$) was found between the total mean scores, while the reliability correlation was found to be within the appropriate range (0.55–0.85). The scale demonstrated good test-retest reliability (ICC = 0.762, $p < 0.01$), indicating temporal consistency. CFA confirmed the results, showing acceptable model fit: CFI = 0.929, TLI = 0.916, RMSEA = 0.071, and SRMR = 0.079.

Conclusions: The results of the study show that the scale is a valid and reliable tool that can be used to determine the motivation of health personnel working in public health organizations in Turkish society.

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1. Introduction

Primary healthcare services encompass a holistic approach, including basic preventive health services, pre-diagnosis/treatment services, rehabilitation, education, and supervision services for individuals, their environments, and society [1]. Often referred to as a "gatekeeper" system, these services involve patients seeking care from primary healthcare providers, who evaluate their needs and devise intervention plans. The motivation of personnel in these institutions is crucial for effective performance [2,3]. The concept of motivation, rooted in the Latin word "movere, motum," encompasses willingness and mobilizing power, as expressed in Herzberg's "The Motivation to Work" and Maslow's "Hierarchy of Needs," which underscore motivation as an individual and developmental process [4].

Maslow and Herzberg provide a theoretical framework for understanding the concept of motivation at individual and organisational levels. According to Maslow, meeting the basic needs of individuals (physiological needs and safety) provides access to higher level motivation elements (belonging, appreciation and self-actualisation) [5]. In this framework, in order to increase the motivation of community health workers, it is important to meet both basic needs and to provide opportunities for personal development. Herzberg's theory divides the factors affecting motivation into 'hygiene' and 'motivator' elements. Although the lack of hygiene factors such as salary and job security decreases motivation, these factors alone do not increase motivation; motivators such as achievement, recognition and meaningfulness of work directly affect job satisfaction and performance [6]. These two theories constitute the theoretical underpinnings of a scale to be adapted to measure the motivation levels of community health workers and show that this measurement will guide the understanding of both individual and organisational needs.

Motivation holds significant importance in primary healthcare services, where human factors and high stress levels prevail [7,8]. Work commitment, motivation, and job satisfaction are pivotal for healthcare workers to deliver quality service. Motivated healthcare professionals are crucial for institutions, organizations, and society as a whole, ensuring quality care for patients and their families. Investing in healthcare worker motivation yields benefits for both their well-being and the quality of patient care, resulting in enhanced efficiency, productivity, and overall satisfaction [8,9]. Compared to the average data of OECD countries, Turkey has 1/3 of the average number of health personnel per capita. The health system needs to have a well-motivated and professional health workforce in addition to adequate personnel [10].

Health worker motivation is crucial for delivering quality healthcare, especially in rural areas, and for advancing Sustainable Development Goals [11] There's growing interest among policymakers and researchers in understanding motivation among health workers in low- and middle-income countries [12–14]. Assessing and addressing factors influencing motivation are vital for effective human resource strategies and policy decisions [12,15,16]. Therefore, evaluating the impact of national reforms and programs on health worker motivation is recommended [17–19].

The research has a strength in terms of multidimensional evaluation of motivation. In studies on motivation, there are many individual and environmental factors (such as job commitment, career opportunity, incentives, individual roles and support mechanisms) that reduce motivation [20,21]. Although these factors vary according to cultural, economic and social differences, it is thought that multidimensional scales are sufficient to evaluate motivation.

Community health workers have important roles in eliminating health service deficiencies and reducing health inequalities,

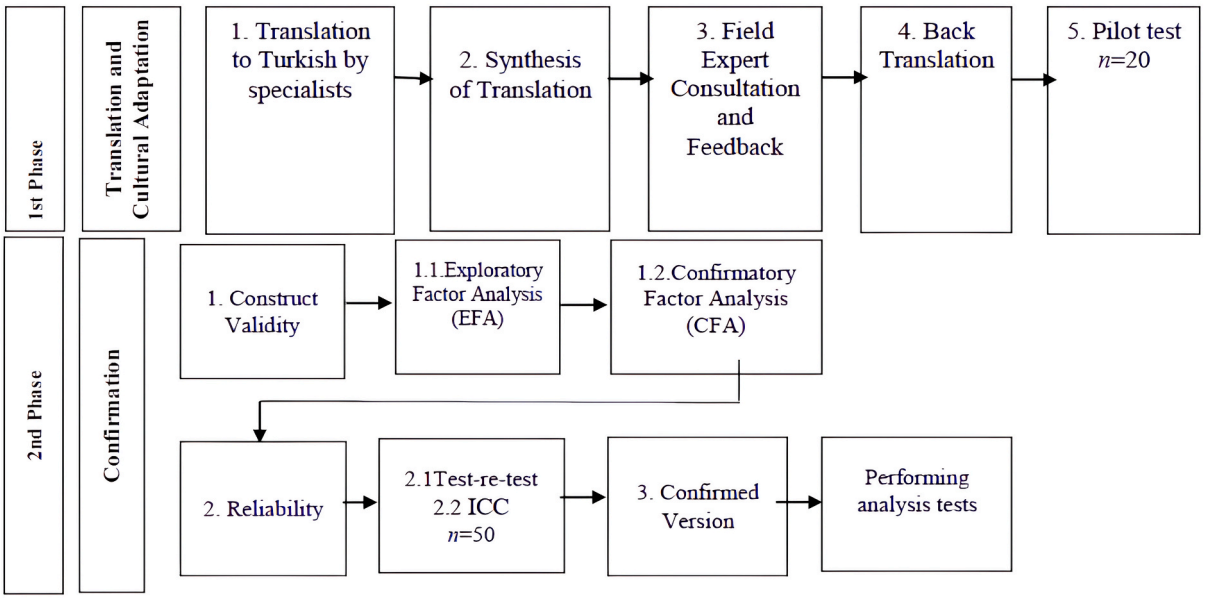


Fig. 1. General definition of the algorithma of the MCHW translation, cultural adaptation, and confirmation.

especially in rural areas. Highly motivated staff will prevent health inequalities [22,23]. Therefore, motivation needs to attract the attention of decision makers and policy makers, especially to support middle and low-income communities [24].

Looking at the literature, there are scales in Turkey to measure motivation among adults, employees, public service workers, academics, nurses (including psychiatric nurses), and other health-care workers [25–31]. However, there's a lack of a multidimensional measurement tool specifically for evaluating the motivation levels of community health workers. Developing a profession-specific tool can provide more objective results. Motivation is a complex construct requiring thorough examination [32]. The study examining the validity of the inferences of such a scale and the reliability of the scores may contribute to the development of policies to increase the motivation of community health workers.

2. Methods

2.1. Aim

With this scale, it is aimed to provide a robust tool for the integration of multidimensional motivation into health policies by adaptation a multidimensional scale specific to the Turkish society. Thus, we adapted the Multidimensional Motivation Scale for Community Health Workers developed by Gottert et al. [32] to the Turkish population and tested the validity of the inferences and the reliability of the scores.

2.2. Design

This study evaluated the psychometric properties of the Multidimensional Motivation Scale for Community Health Workers (MCHW) to assess its suitability for the Turkish population.

2.3. Study implementation plan

The stages of the methodological review are described in Fig. 1.

Phase 1: Translation and Cultural Adaptation of the Scale: The MCHW, developed by Gottert et al. [32] and consisting of 22 items, was translated from English to Turkish by two linguists who are native Turkish speakers. In order to eliminate inadequate parts and inconsistencies of the translation, the items of the scale were evaluated by three public health experts with experience in examining the agreement between English and Turkish languages. Some items in the original scale were edited to make them more easily understood by the Turkish population. For example: 'Total amount of financial incentives you receive' was explained to the participants as "Total amount of financial incentives you receive (salary + performance + additional payment, etc.)".

After the corrections in translation, the final Turkish language format of the MCHW was sent to the expert opinion of 10 faculty members to determine to what extent the items are relevant to the attribute to be measured and to what extent they represent its scope [33].

Adjustments were made taking into account the suggestions and evaluation scores of 5 faculty members who provided feedback (one measurement and evaluation specialist, four faculty members with the title of associate professor and professor of Public Health Nursing). After the expert evaluation, the term 'financial incentive or additional payment' was used instead of 'arrangement'. The Davis technique was used to evaluate the expert opinions and the content validity index of the scale items was found to be above 0.80 [34]. While the Davis Technique is a practical and useful tool in content validity assessments, its reliability and comprehensive validity were ensured by performing EFA and CFA to support it.

The Turkish version of the scale was back-translated from Turkish to English by two linguists and the agreement between the Turkish and English versions was ensured. After it was determined that the language and content equivalence of the scale was sufficient, a pilot study was conducted with 20 people who were not included in the study for the comprehensibility and readability of the MCHW. The final version of the scale was created and the World Health Organisation (WHO) translation guidelines were taken as reference in all processes [35].

Phase 2: Validity of inferences the Scale: Exploratory factor analysis (EFA) was applied to reveal item-factor relationships, and confirmatory factor analysis (CFA) was applied to test the appropriateness of the items and sub-dimensions to the structure of the original scale. Cronbach's alpha coefficient was used to determine the internal consistency of the scale and its sub-dimensions. Test-retest analysis was performed to test the consistency of the scale over time and the scale was finalized.

2.4. Population and sample

In the literature, it is recommended to perform EFA and CFA in separate samples [36]. However, due to the restrictions imposed during the COVID-19 pandemic, the targeted sample could not be reached and this situation created a limitation in sample determination. Therefore, the study was based on the criterion that the sample size should be at least 10 times the number of items [37].

The original MCHW scale used in this study consists of 22 items. In total, 235 individuals participated through a face-to-face questionnaire; after excluding invalid responses and outliers, 220 participants were included in the analyses. Factor loadings higher than 0.40 and communalities higher than 0.50 made this situation tolerable despite the relatively low sample size [36]. In addition, the KMO value was at an excellent level (.901), which supported that the sample size was suitable for factor analysis.

Monte Carlo simulation was also performed to determine the adequacy of the sample size to be used in this study. The simulation

was designed considering a structure with 4 factors and 5 items in each factor. The average factor loading was determined as 0.6, error variance as 0.4 and correlation between factors as 0.4. In the simulation, 1000 cycles were run for sample sizes ranging from 200 to 300, assuming that the RMSEA value is acceptable in the range of 0.05–0.08. According to the simulation results, 86.8 % of the RMSEA values were found to be acceptable in the sample of 200, while this rate was 85.9 % in the sample of 250. Accordingly, the appropriate sample range was determined as 200–250 people and it was concluded that this size was sufficient to reliably evaluate the expected construct fit [38].

The population of the study consisted of health personnel working in the Provincial Directorate of Public Health (DPH), Community Health Center (CHC), Family Health Center (FHC), Healthy Life Center (HLC), Migrant Health Center (MHC), and Tuberculosis Dispensary Units (TDU) in a province located in the Central Anatolia region of Turkey. In methodological studies, the sample is required to be at least 10 times the number of items [27]. The research data were collected through a face-to-face questionnaire.

Inclusion Criteria: People who were community health workers in DPH, CHC, FHC, HLC, MHC, TDU institutions, who were 18 years of age or older, who could read and write, who did not have mental disabilities and who agreed to participate in the study were included in this study.

2.5. The instrument

In this study, data were collected using the "Descriptive Information Form" and the "Multidimensional Motivation Scale for Community Health Workers (MCHW)" developed by Gottert et al. Expert opinions and scores were also determined using the expert evaluation form [32].

Descriptive Information Form: This form, which is based on the literature [32,39,40], includes questions that evaluate the descriptive characteristics of the participants regarding socio-demographic characteristics (6 questions) and motivation (5 questions). Descriptive information is provided in Table 1.

Community Health Worker Motivation Scale (MCHW): Gottert et al.'s scale was used because it is specific to community health workers and explains motivation in many dimensions [32]. The Multidimensional Motivation Scale for Community Health Workers (MCHW) was developed by Gottert et al. in 2021 by studying Mali and Bangladesh samples. The MCHW has four factors, 22 items and a four-point Likert scale. The increase in the score obtained from the scale indicates an increase in motivation. Cronbach's α value was between 0.78 and 0.92 for the sub-dimensions and $\alpha = 0.92$ for the whole scale. When scoring the scale, a three-point Likert scale of "not very important, important, very important" was used for the sub-dimensions and a four-point Likert scale of "not at all satisfied, dissatisfied, satisfied, very satisfied" was used for the items. Sub-dimensions are scored as 1,2,3 and items are scored as −2, −1, 1, 2. The average item score in each sub-dimension varies between −2 and +2 and the average score value is multiplied by the sub-dimension score. In other words, the minimum value for the sub-dimension is −6 and the maximum value is +6. When the scores calculated for each sub-dimension are summed in this way, the total score of the scale is obtained.

2.6. Data collection and analysis

Data were collected in the study settings between October 1, 2022 and December 31, 2022 through a face-to-face questionnaire in line with the inclusion criteria.

Table 1
Distribution of data obtained regarding demographic and occupational information of employees.

		TOTAL				TOTAL	
Variables	Groups	N	%	Variables	Groups	N	%
Gender	Male	47	21.4	**Working Year**	1–9	94	42.7
	Woman	173	78.6		10–19	67	30.5
Age	24–32	51	23.2		20–29	46	20.9
	33–41	72	32.7		30–39	13	5.9
	42–50	69	31.4	**Institution of Work**	DPH	111	50.5
	51–60	28	12.7		CHC	33	15.0
Marital status	Married	175	79.5		FHC	13	5.9
	Single	45	20.5		HLC	41	18.6
Income status	Income < Expense	125	56.8		MHC	13	5.9
	Income = Expense	82	37.3		TDU	9	4.1
	Income > Expense	13	5.9	**Job**	Doctor	18	8.2
Educational Status	High school	17	7.7		Nurse	56	25.5
	University	168	76.4		Midwife	54	24.5
	Postgraduate	35	15.9		Other	92	41.8
Reason for Working in the Unit	At my request	194	88.2	**Organizing Events in the Unit**	Yes	136	61.8
	Against my will	26	11.8		No	84	38.2
Total		**220**	**100**	**Participation in Events**	Yes	130	59.1
					No	90	40.9
				Total		**220**	**100**

Note: Provincial Directorate of Public Health (DPH), Community Health Center (CHC), Family Health Center (FHC), Healthy Life Center (HLC), Migrant Health Center (MHC), and Tuberculosis Dispensary Units (TDU).

In order to determine whether the data were normally distributed, the files were divided and normal distribution analysis was performed on a cell basis. The fact that the median, mode and arithmetic mean of the data are close to each other and the kurtosis-skewness coefficient values are in the range of +2 and −2 indicates that the data are normally distributed [37]. The Statistical Package for the Social Sciences (SPSS) 22.0 was used for descriptive and further analysis of the data and AMOS 21 was used for construct validity of inferences.

2.7. Ethics of the study

Permission was obtained from the responsible author for the validity of inferences and reliability of scores study of this scale in the Turkish population [32]. The study was approved by the authors' institutional ethics committee, and all participants provided informed consent.

3. Results

3.1. Exploratory factor analysis (EFA)

Exploratory Factor Analysis (EFA) was conducted using the SPSS 22.0 program to determine the construct validity of inferences of the scale. Normal distribution was analyzed by Barlett's test and sample size was analyzed by KMO test. KMO value should be greater than .05 for normal distribution condition and Barlett value should be less than .05 for sample adequacy [37]. As a result of the factor analysis, KMO value was .901 and Barlett value was 3385.63 ($p<.000$). These results show that the scale meets the necessary conditions for factor analysis. As a result of EFA, the Extraction value of each item in the scale should be above 0.3 and those below 0.1 should be removed [37]. All items in the scale meet this criterion.

Büyüköztürk [41] states that high variance provides detailed information about factor power. The variance explained by the factors should be more than 40 % of the total variance. And each factor should explain at least 5 % of the total variance [37]. As a result of the analysis, four factors with a total value higher than 1.0 were found and these four factors explain 66.48 % of the total variance. The factors up to the point where the scree plot starts to flatten are considered to contribute to the explained variance [42]. Fig. 2 shows the scree plot.

As a result of EFA, rotation was performed with Direct Oblimin since the Component Matrix values were greater than 0.3. As a result of the pattern matrix, the 12th item was seen under the peer respect and support factor (.318) and the feeling valued and competent factor (.369) and since the difference between them was less than one, it was accepted as an overlapping item and removed from the scale. As a result of the EFA (after the removal of the 12th item), no overlapping item was observed. The pattern matrix table resulting from EFA shows the distribution of item loadings under the factors. It is desired to have at least three items explaining at least 5 % of the variance under each factor (Table 2) [37]. The factor loading of the item under a factor must be at least 0.30 [31–43]. According to the pattern matrix result, it was determined that the number of items under the factors was more than three and the factor loadings were between 0.541 and 0.895. High factor loadings are considered as an indicator that the observed variable can be found under the specified factor [41].

As a result of the correlation matrix made to see the theoretical relationship between the sub-dimensions of the scale, low level correlation between factors was confirmed (f1-f2:.221; f1-f3:.380; f1-f4:.480; f2-f3:.225; f2-f4:.281; f3-f4:.263). As a result, items 1,2,3,4,5 and 6 were grouped under factor Quality of supervision; items 18,19,20,21 and 22 under factor Compensation and workload;

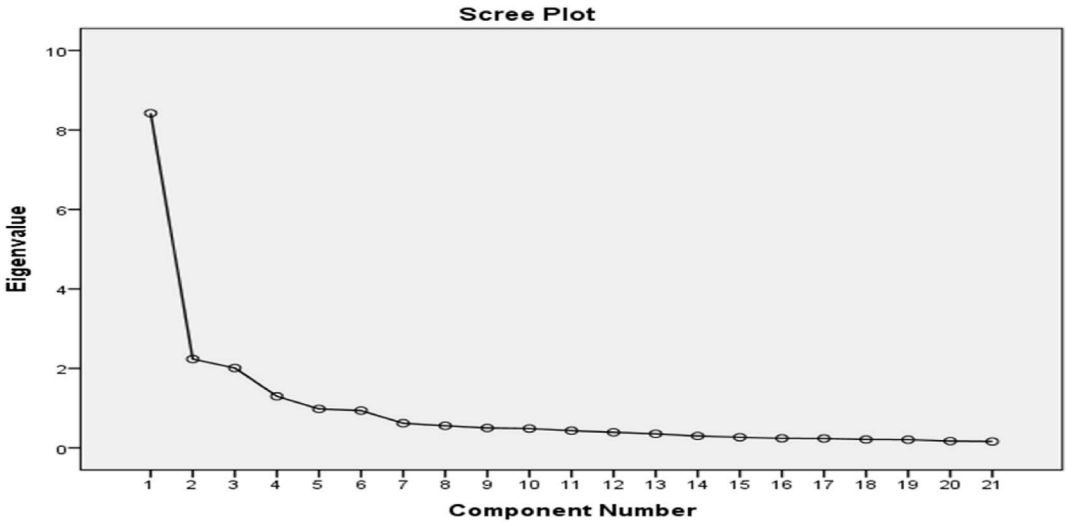


Fig. 2. MCHW Scale scree plot curve.

Table 2
MCHW scale pattern matrix table.

	Component			
	Quality of supervision	Compensation and workload	Peer respect and support	Feeling valued and competent
t1	,849			
t2	,874			
t3	,895			
t4	,604			
t5	,764			
t6	,848			
t7				,859
t8				,748
t9				,661
t10				,565
t11				,541
t13			,811	
t14			,817	
t15			,846	
t16			,653	
t17			,557	
t18		,769		
t19		,769		
t20		,801		
t21		,594		
t22		,594		

items 13,14,15,16 and 17 under factor Peer respect and support; and items 7,8,9,10 and 11 under factor Feeling valued and competent. As a result of the reliability analysis of the 21-item version of the scale after EFA, the Cronbach Alpha coefficient was .919 and it was seen that the scale was a reliable (>.70) measurement tool.

3.2. Confirmatory factor analysis (CFA)

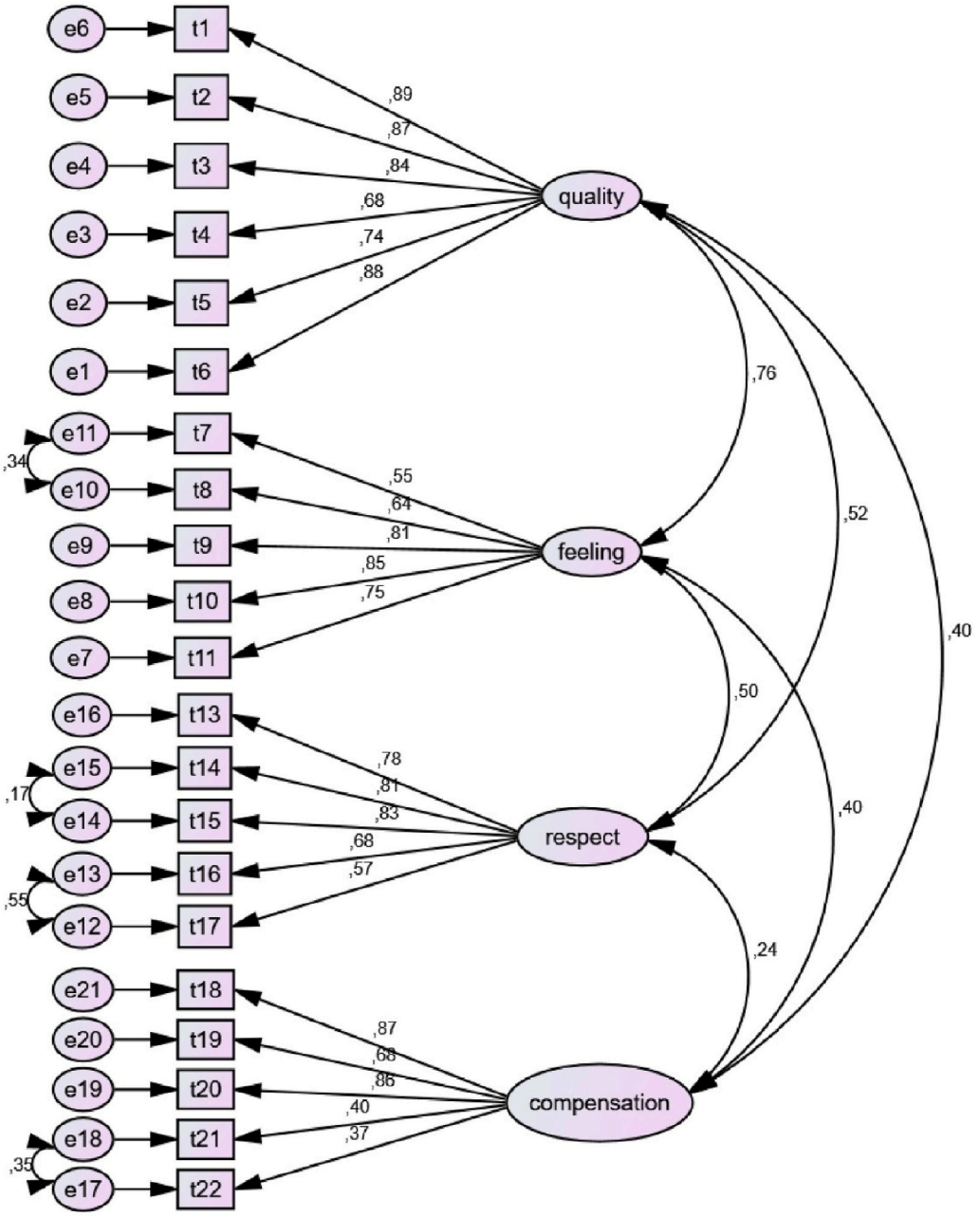
After the EFA process, all items of the 21-item scale were included in the CFA process. AMOS 21 application was used for the CFA process. The purpose of confirmatory factor analysis is to determine the conformity of the scale to the original structure [44]. After the first CFA, some fit tests were not as good as desired (RMSEA = 0.095, $\chi 2/df = 3$).Low model fit indices indicate that there may be inadequacies in explaining the relationship between items [45]. In this context, in order to increase the fit indices, the error covariances between the items were intervened in line with the modification suggestions. However, while performing these procedures, only the items in the same sub-dimension and in accordance with the theoretical framework were taken into consideration. This approach aims to maintain the validity of inferences and reliability of scores standards of the measurement tool. As a matter of fact, the application of the modifications suggested in the SEM process increases the parsimony level and fit indices of the model, allowing a more valid measurement model to be obtained [46]. At the same time, this process is planned in a way not to disturb the fit of the model with the theoretical framework [47]. In order to improve the fit, the 21st and 22nd item under factor Compensation and workload; the 14th and 15th item under factor Peer respect and support; the 16th and 17th item; the 7th and 8th item under factor Feeling valued and competent were modified and the required fit values were obtained. The path diagram of the scale after CFA is given in Fig. 3.

The item standardized solution values obtained in confirmatory factor analysis should be between zero and one. It is ideal for this number to be higher than 0.5 [32]. No item was removed in the CFA process. Table 3 shows the fit index values after CFA analysis. These indices should be evaluated as a whole. A poor fit of a single index does not necessarily mean that the model is poorly fit overall. CFI and RMSEA are generally considered the most critical fit indices. If CFI $\geq$0.90, TLI $\geq$0.90, RMSEA $\leq$0.08, SRMR $\leq$0.10, it can be said that the overall fit of the model is good [48].

According to the analysis of validity of inferences (AVE, ASV, MSV) and reliability of scores (CR), the majority of the structures are above the acceptable limits in terms of construct validity of inferences and the model is generally compatible (Table 4). However, a discriminant validity problem was found in the construct of “Feeling valued and capable” and a lack of AVE in the construct of “Compensation and workload”. This situation shows that the relevant structures should be examined in more detail [49].

3.3. Findings related to reliability

Reliability indicates how stable the measurement results are [44] The "Cronbach’s Alpha" reliability coefficient, which is frequently used to determine the internal consistency of the scale, is desired to be at a value of .70 and above [37]. Reliability, test-retest and intraclass correlation coefficient (ICC) analyses conducted after factor analysis are presented in Table 5. Reliability values for the 12th item removed from the scale are not given in the table below. Cronbach’s alpha coefficient of the overall scale was .919, quality of supervision sub-dimension was .922, feeling valued and competent sub-dimension was .852, peer respect and support sub-dimension was .862 and compensation and workload sub-dimension was .789. The accepted value for reliability is .70 and above [44]. For the



Chi-Square=377,809, df=179, p-value=0.000, RMSEA=0.071, p-close=0.00, CFI=0.929, TLI=0.916, SRMR=0.079

Fig. 3. Path diagram of the scale after CFA.

test-retest reliability of the study, data were collected from 50 randomly selected participants one month later. According to Bloxom and Knapp, the acceptable test-retest reliability correlation should be in the range of 0.55–0.85 [50]. In the statistical analysis, no significant difference was found between the test-retest total mean scores ($p > 0.05$). In our study, the ICC was used to measure the degree of correlation and agreement between the measures. The results were calculated as ICC = 0.762 (95 % CI: 0.583–0.864), indicating a good level of inter-rater reliability. The ICC value was found to be significant ($p < 0.01$) [51]. These results show that the scale has temporal consistency. There was no difference in measurement invariance between men and women and the AMOS model

Table 3
Confirmatory factor analysis fit index results.

Fit Index	Coefficients	Perfect fit limit	Accepted compliance limit	compliance status
CFI	.929	0.95 ≤ CFI	0.90 ≤ CFI	Acceptable
TLI	.916	0.95 ≤ TLI	0.90 ≤ TLI	Acceptable
RMSEA	.071	0.60 ≥ RMSEA	0.80 ≥ RMSEA	Acceptable
SRMR	.079		0.80 ≥ SRMR	Acceptable
χ2/df	2.11	The value found should be statistically insignificant and χ2/df ≤ 3.		Acceptable

Table 4
Validity and reliability statistics results.

Factor	CR	AVE	MSV	ASV
Accepted compliance limit	≥0,70	≥0,50	AVE ≥ MSV	AVE ≥ ASV
Quality of supervision	0.92	0.67	0.57	0.33
Feeling valued and competent	0.85	0.53	0.57	0.33
Peer respect and support	0.85	0.54	0.27	0.19
Compensation and workload	0.79	0.45	0.16	0.13

Table 5
Reliability analysis, test-retest results and Intraclass correlation coefficient.

Article	Corrected Item-Total Correlation	Reliability coefficient	Test x1 ± ss1	Retest x2 ± ss2	t	p Pearson Correlation (r)
Quality of supervision		.922	1.19 ± 3.02	0.68 ± 2.27	1.71	p: .094 r: .713
1	.842					
2	.829					
3	.804					
4	.654					
5	.717					
6	.829					
Feeling valued and competent		.852	0.36 ± 2.82	0.40 ± 2.35	-.144	p:.886 r: .665
7	.586					
8	.651					
9	.724					
10	.713					
11	.653					
Peer respect and support		.862	1.86 ± 2.34	1.52 ± 1.93	1.62	p:.103 r: .788
13	.648					
14	.742					
15	.707					
16	.716					
17	.619					
Compensation and workload		.789	−1.90 ± 2.72	−2.57 ± 2.74	1.46	p:.149 r: .314
18	.653					
19	.624					
20	.660					
21	.469					
22	.456					
Total Scale		.919				
Intraclass Correlation Coefficient						
Intraclass correlation	**95 %CI Lower Bound**		**95 %CI Upper Bound**		**p**	
.762	.583		.864		.000	

was found to work.

3.4. Findings related to descriptive and inferential analysis

In the descriptive statistics section, frequency and percentage distributions of the data, and in the inferential statistics section, independent sample *t*-test and one-factor analysis of variance test results were included.

In the score calculations, the total score of the scale is scored between −24 and + 24, and the sub-dimensions are scored between the lowest −6 and +6. The higher the total score obtained from the scale, the higher the motivation level. Scale total and subscale mean scores were categorised as very low, low, high and very high. In this study, it was determined that the motivation values of the participants were at a high level (3,43 ± 7,60) according to the total score of the scale. It was determined that the mean scores of the participants' quality of supervision (1,50 ± 2,74), feeling valued and competent (0,83 ± 2,44), peer respect and support (2,24 ± 2,05) sub-dimension scores were high, and the mean scores of the sub-dimension Compensation and workload (−1,15 ± 2,61) were low.

When Table 6 is analyzed, it is seen that there is no statistically significant difference between the mean MCHW total scores of the participants and age and marital status ($p > 0.05$). A statistically significant difference was found between the mean MCHW total score of the participants and gender ($p < 0.01$). It was observed that males had a higher mean MCHW score than females.

In Table 7, it is seen that there is no statistically significant difference between the mean total scores of the participants and their years of employment ($p > 0.05$). A statistically significant difference was found between the mean MCHW total scores of the participants and the institution and occupation status ($p < 0.01$). It was observed that the mean MCHW total scores of the employees working at the Provincial Directorate of Public Health Services were higher than those working at the Community Health Center. It was observed that the mean total score of the MCHW total score of the physicians was higher than that of the midwives.

4. Discussion

The original scale items were translated into Turkish by two English native linguists for cultural adaptation. Expert opinions from 5 faculty members ensured linguistic consistency, with adjustments made accordingly. The content validity index, evaluated using the Davis technique, exceeded 0.80 [34]. A pilot study with 20 participants confirmed the scale's comprehensibility and readability. Following the pilot study, both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to validate the finalized scale. The Kaiser-Meyer-Olkin (KMO) and Bartlett tests confirmed normal data distribution and sample sufficiency [27]. EFA revealed a four-factor structure explaining 66.48 % of the total variance. However, one item from the original scale was removed due to factor loading inconsistencies. After adjustments, factor loadings ranged from 0.541 to 0.895 [32]. Low correlations between factors were confirmed. CFA was then conducted to confirm the scale's structure, with modifications made for improved fit values. The resulting 21-item scale with four factors demonstrated acceptable fit index values. The Cronbach's alpha test showed reliability values between .919 and .789 for both the overall scale and its sub-dimensions, meeting the accepted threshold of .70. In a test-retest with 50 randomly selected participants, no significant difference was found in scale mean scores. The Pearson correlation value of .713 confirmed consistent results over time, aligning with the acceptable test-retest reliability correlation range. The scale developed by Gottert et al. in 2021 was found to be validity of inference and reliability of scores for community health workers over the age of 18 living in Turkey. This scale is an important tool for understanding the motivation of health professionals and improving the quality of health services.

Cronbach's α value was found to be between 0.78 and 0.92 for the sub-dimensions of the study and α = 0.92 for the whole scale. These coefficients are higher values compared to other instruments in the literature that measure the motivation of healthcare workers and include similar sub-dimensions. For example, in the study of Mbindyo et al. [52], Cronbach's α value was reported as 0.75 and in the range of 0.36–0.64 for sub-dimensions, while in the study of Prytherc et al. [53], Cronbach's α was found to be 0.87 and sub-dimensions were found between 0.37 and 0.76. Thanh et al. [54] reported Cronbach's α between 0.87 and sub-dimensions between 0.88 and 0.89. In the study of Vallieres et al. [55], Cronbach's α value was found to be 0.90 and the sub-dimensions were in the range of 0.53–0.82.

In studies conducted in different languages and countries on measuring multidimensional work motivation in the literature, it is seen that alpha coefficients and model fit indices are lower compared to this study [55–57]. The most similar fit indices and reliability coefficients with our study were found in Li et al. [58].

Among the main reasons for these differences, the socioeconomic level differences, income level and the effect of the participants' professional environment conditions stand out. In addition, the structural differences between the sub-dimensions of the scales and the

Table 6
Examination of MCHW according to socio-demographic characteristics of participants.

Variables	N = 220	%	MCHW	Mean	±sd
Age					
24-32	51	23.2		3.88	7.34
33-41	72	32.7	F: .745 p: 0.526	2.62	7.50
42-50	69	31.4		3.30	8.19
51-60	28	12.7		5.02	6.87
Gender					
Male	47	21.4	**t: 3.077**	6.40	7.85
Woman	173	78.6	**p: 0.002**	2.63	7.35
Marital Status					
Married	175	79.5	t: -.269	3.36	7.84
Single	45	20.5	p: 0.788	3.70	6.65

Note. MCHW = Multidimensional Motivation Scale for Community Health Workers, <.01 was considered statistically significant, a and b = Variables with statistically significant differences between them.

Table 7
Examination of MCHW according to participants' professional knowledge.

Variables	N = 220	%	MCHW	Mean	±Sd
Year of Operation					
1–9	94	42.7		3.49	7.41
10–19	67	30.5	F: .636 p: 0.593	3.23	7.31
20–29	46	20.9		2.85	8.63
30–39	13	5.9		6.10	6.78
Employed Institution					
DPH[a]	111	50.5		4.69	7.02
CHC[b]	33	15.0		-.52	9.70
FHC	13	5.9	**F: 3.119 p: 0.010**	4.16	3.71
HLC	41	18.6		3.99	7.77
MHC	13	5.9		.076	7.09
TDU	9	4.1		3.77	4.62
Profession					
Doctor[a]	18	8.2		6.20	9.78
Nurse	56	25.5	**F: 2.979 p: 0.032**	4.04	6.27
Midwife[b]	54	24.5		1.00	7.68
Other	92	41.8		3.95	7.58

Note: Provincial Directorate of Public Health (DPH), Community Health Center (CHC), Family Health Center (FHC), Healthy Life Center (HLC), Migrant Health Center (MHC), and Tuberculosis Dispensary Units (TDU).

cultural adaptation processes of the instruments used also play a decisive role in this situation. For example, some studies were applied in regions with lower economic levels, which led to a more predominance of external factors affecting motivation. In addition, the way the sub-dimensions are defined and their contents are also among the factors that increase the diversity in the results.

The motivation of healthcare professionals is very important for both themselves and their patients. In this study, it was determined that the motivation values of the participants were at a high level (3.49 ± 7.54). In the literature, in the study conducted by Naldöken and Sarıçoban [4] on the motivation levels of health workers, the motivation levels of community health workers were found to be at a medium level, while there were studies in which the motivation level was found to be high [21,59]. The motivation levels of healthcare workers vary depending on the structure of the healthcare system, the importance given to primary healthcare services, workload, working conditions, wage amount, career opportunities, education and support systems, and social and cultural differences.

In this study, the motivation levels of health workers differed according to gender, institution and occupation. As a result of the study, it was observed that men had higher motivation levels than women. Parallel and different results were found in the literature. For example, while some studies have shown that men have higher motivation levels [60–62], some studies have shown that women have higher motivation levels [4,59,63]. It is plausible that, in the Turkish context, prevailing gender norms allocate greater power and leadership responsibilities to men; consequently, male employees are more likely to hold managerial positions and encounter less discrimination, which may contribute to higher motivation [64,65]. Gender equality should be ensured by providing extra support to women working in the field of public health, especially in terms of work and life balance [66].

The findings of the study showed that doctors had higher motivation levels than midwives. This finding is consistent with some previous studies. Studies by Lambrou et al. [67], Orhaner & Mutlu [7] and Weldegebrial et al. [59] showed that motivation was higher in doctors. In the study conducted by Sheikh & Gele [60], it was stated that the motivation of midwives was lower. Unlike these data, in the study conducted by Uysal et al. [62], it was stated that the motivation levels of healthcare professionals did not vary according to professions. Differences stand out in the existing studies in the literature. These results, which vary according to regions, are thought to be due to social and cultural factors, management and support systems, workload and conditions, and the quality of health services. In addition, there are many reasons why physicians have high motivation. These reasons include professional satisfaction, social prestige, intellectual stimulation, financial gain, career opportunities, learning and development, autonomy and responsibility, teamwork, sense of achievement and helpfulness [68]. As the level of education increases, professional career and income also increase, which keeps the motivation levels of educated health personnel high [69].

It was found that health workers whose income was higher than expenses had higher levels of motivation. There is evidence that different types of incentives, such as direct payments and organizational rewards, contribute to improving the performance of health workers [70]. Adequate incentives and salaries make it easier for health workers to meet their basic needs, increase their standard of living, reduce anxiety about the future, and increase their sense of recognition and appreciation [71]. Therefore, it is thought that health workers with high income are more motivated at work. In the literature, although financial incentives and salary issues have been the focus on when examining the motivation of healthcare workers, non-financial incentives such as career development, professional satisfaction and improving the recognition scheme should also be recognized as important [72,73].

It was observed that the motivation levels of health personnel working at the provincial directorate of public health services were higher than those working at the community health center. It is thought that factors such as having greater responsibilities, having a wider sphere of influence and being closer to decision-making processes may be effective behind this situation. In addition, the fact that employees at the provincial directorate level are in closer cooperation with higher level managers and participate in policy-making processes may be factors that increase their motivation.

In the literature, motivation is addressed in individual, social and professional dimensions such as work/employee motivation, work motivation and general motivation (27–31). In this research, especially the studies that use classical theories such as Herzberg's

and Maslow's more effectively and examine motivation specific to the field of study draw attention. Since the tools developed to evaluate the motivation of community health workers in the literature are limited, it is assumed that this study will fulfil this need.

5. Conclusion

The study presents a motivation scale whose inferences are valid and scores are reliable for Turkish community health workers aged 18 years and older. Participants' motivation levels were affected by factors such as gender, organisation and occupation. In general, men, doctors and those working in provincial directorates exhibited higher levels of motivation. These findings underscore the need for tailored strategies to enhance healthcare quality and optimize health worker performance. The use of the multidimensional motivation scale in the field and studies investigating the long-term effects of motivation are recommended. It is recommended that the scale be studied with larger and different groups to provide more reliable scores and more valid inferences.

6. Limitations

The limitations of the study are that both EFA and CFA were conducted in the same sample group, the sample was limited to a single city and did not include health personnel in family health centres or rural workers, which potentially affected the generalisability of the findings. External factors such as the COVID-19 pandemic and high inflation during data collection may have negatively affected the motivation of healthcare workers and affected the study results. Future research with larger and more diverse samples collected in different time periods may yield more accurate results.

CRediT authorship contribution statement

Hakan Çelik: Writing – original draft, Visualization, Validation, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Mustafa Özer:** Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Betül Özen:** Resources, Methodology, Conceptualization, Data curation, Formal analysis, Investigation, Project administration, Validation, Visualization, Writing – original draft.

Data availability statement

The data supporting the findings of this study will be made available upon reasonable request from the corresponding author.

Ethics statement

This study was approved by the Cukurova University Faculty of Medicine Non-Interventional Clinical Research Ethics Committee on 11 June 2021 under Meeting No. 112. All participants provided written informed consent.

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.heliyon.2025.e44177.

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