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ORIGINAL ARTICLE

ADAPTATION AND PSYCHOMETRIC EVALUATION OF THE TURKISH VERSION OF THE MATCH SCALE: ASSESSING MOTIVATION AND ATTITUDES TOWARD CHANGING HEALTH BEHAVIOR IN OLDER ADULTS WITH TYPE 2 DIABETES

Abstract

Introduction: This study aimed to adapt the Motivation and Attitudes Toward Changing Health Scale into Turkish and to evaluate its validity and reliability in older adults with type 2 diabetes.

Materials and Method: This research was designed as a psychometric study. A total of 135 individuals aged 65 years and older with type 2 diabetes participated in the study. The scale was evaluated through various validity and reliability analyses. The language validity of the scale was confirmed through translation, back-translation, expert evaluation, and pre-application. Reliability and validity assessments included item analysis, criterion validity for construct validity, confirmatory factor analysis, and test-retest reliability.

Results: The content validity index was calculated at 0.91 based on expert evaluations. The three-factor structure of the scale explained 72% of the total variance. The statistical indicators used to evaluate the model fit showed that the model had an acceptable level of fit with the data. Specifically, the root mean square error of approximation was 0.11, the goodness of fit index was 0.90, the adjusted goodness of fit index was 0.82, the comparative fit index was 0.94, and the chi-square value was 66.18. These results were statistically significant ($p < 0.001$). The test-retest reliability result was statistically significant ($r:0.98$, $p<0.001$), indicating high reliability, with a Cronbach's alpha value of 0.85.

Conclusion: The scale is valid and reliable, making it an effective tool for measuring the motivation and attitudes of older adults with diabetes toward changing their health related behaviors.

Keywords: Motivation; Attitude; Health; Psychometrics; Aged.

INTRODUCTION

Diabetes, which is increasingly common worldwide, affects more individuals every day. Effective disease management is crucial in preventing diabetes related complications and achieving optimal health outcomes. Understanding diabetic patients' motivation and attitudes toward changing health behaviors plays a significant role in sustaining long-term self-management strategies (1,2). The management of diabetes is of paramount importance due to its rising prevalence, particularly among older adults, and the numerous acute and chronic complications it can cause. In aging individuals, diabetes not only contributes to increased mortality and morbidity rates but also exacerbates age-related health concerns, diminishes overall quality of life, and places a substantial burden on healthcare systems (1,2). The primary objective of diabetes management in older adults is to prevent both acute and chronic complications while maintaining functional independence and overall well-being. Older adults with diabetes should actively engage in self-management and integrate essential self-care practices into their daily routines to preserve their health and autonomy (3,4). Given the physiological changes associated with aging, such as altered metabolism, reduced physical mobility, and cognitive decline, maintaining motivation for self-care behaviors becomes even more critical. These behaviors include adopting a healthy lifestyle with a balanced diet, appropriate physical activity, and effective stress management strategies tailored to the needs and capabilities of older individuals (4,5). Achieving targeted health outcomes in diabetes management among older adults requires both optimal clinical care and the implementation of effective, individualized self-management strategies (6,7). In this population, both internal and external motivations play a crucial role in shaping diabetes-specific behaviors and maintaining glycemic control. However, diabetes management in older individuals presents additional challenges due to age related factors, making continuous self-regulation more complex. Therefore, structured support in the form of tailored education, motivation, and behavioral change interventions is of paramount importance (1,6,7).

A multidisciplinary approach is essential for preventing diabetes-related complications, enhancing self-management capabilities, and promoting sustainable lifestyle modifications in older adults (8-12). Education remains the cornerstone of effective diabetes self-management, as increased knowledge fosters meaningful behavioral changes that contribute to improved health outcomes and overall quality of life in this population (8-12).

The concept of empowerment has gained traction in contemporary diabetes care, emphasizing patient centered, collaborative processes. This approach enables individuals with diabetes to take an active role in their health, make informed decisions, and manage their condition more effectively while maintaining their independence (9,10,12). Older adults with diabetes can be empowered and motivated to overcome challenges in maintaining glycemic control, adapting to the complexities of disease management, implementing positive behavioral changes, and adhering to treatment recommendations despite age-related limitations (13). Motivation plays a crucial role in shaping effective self-management strategies, which in turn contribute to better metabolic outcomes, improved physical and mental well-being, enhanced quality of life, and reduced healthcare costs (13). Various theoretical models, including empowerment, health belief models, social support, and self-efficacy, can support diabetes self-management in older adults. While these models differ in their approach and terminology, they all emphasize personalized care tailored to diabetic patients' unique needs, expectations, and capabilities (14–17). However, despite the availability of evidence-based strategies for diabetes management, many older adults continue to struggle with glycemic control.

Sustaining positive lifestyle changes in older individuals can be particularly challenging due

to factors such as age-related cognitive and physical decline, long-standing habits, health beliefs, knowledge on diabetes, culture, language proficiency, health literacy, financial limitations, comorbidities, social support, lack of urgency, and fear of failure. These barriers can significantly impact treatment adherence and hinder effective self-management behaviors (16). To ensure effective diabetes management, support adaptation to treatment, and prevent complications in individuals, it is essential to assess their motivation and attitudes before implementing behavioral changes. Therefore, this study aims to adapt The Motivation and Attitudes Toward Changing Health (MATCH) scale into Turkish and assess its psychometric properties, including validity and reliability, among older individuals with type 2 diabetes.

MATERIALS AND METHOD

Study Design

This research was a psychometric study designed to evaluate the validity and reliability of the Turkish version of the Motivation and Attitudes Toward Changing Health (TR-MATCH) scale. The study was conducted at the Diabetes Education Unit of a hospital in western Türkiye. In scale development and validation studies, it is generally recommended that the sample size be at least 5 to 10 times the number of scale items (18). To form the sample for the research, 90 diabetic individuals were sufficient, and 135 individuals were reached. All participants were aged 65 years or older, lived independently in their own homes, and were able to communicate verbally. Individuals with any diagnosed neurological or psychological disorders were excluded. Participants reported no comorbid chronic conditions or medication use unrelated to diabetes. Demographic and clinical characteristics of the participants are summarized in Table 1.

Table 1. Demographic and Clinical Characteristics of the Participants (n = 135)

Characteristic	Value
Age (years) Mean ± SD / Range	71.4 ± 5.03 (Range: 65–85)
Gender n(%)	
Female	83(61.5%)
Male	52 (38.5%)
Living Status n(%)	
Living with spouse	111(82.2%)
Living alone or with others	24(17.8%)
Education Level n(%)	
No formal education	34(25.2%)
Primary school	68(50.4%)
Secondary school or higher	33(24.4%)
Income Status n(%)	
Lower than expenses	79(58.5%)
Equal to or higher than expenses	56(41.5%)
Diabetes Treatment n(%)	
Oral antidiabetic drugs	11(8.1%)
OAD + Insulin	88(65.2%)
Insulin	36(26.7%)
Duration of Diabetes (years) Mean ± SD / Range	12 (Range: 1–32)

OAD: Oral antidiabetic drugs

Data Collection Method

The data were collected through face-to-face interviews by a trained diabetes nurse educator in the diabetes education unit. All participants were volunteers. The MATCH scale is a self-report tool developed by Hessler et al. in 2018 to evaluate individuals' motivation and attitudes toward changing health behaviors (4). The MATCH scale focuses on three important points, which are often neglected, that prevents behavioral change in individuals: (1) willingness to make a change, (2) perceived ability to make or maintain a change, and (3) belief regarding whether or not a change is truly worthwhile. The items of the MATCH scale are scored between 1 to 5. Each MATCH subscale has a cut-off point (low = mean subscale score of 1.0 to 3.49; high = 3.5 to 5.0). In the analysis of this

nine-item scale, three consistent and significant factors were found, constituting 61.5% of the variance. Scoring of the MATCH scale: Willingness: Calculate the mean/average of items 1, 4, and 7. Ability: Calculate the mean/average of items 5, 9, and 2 (item 2: reverse-scored). Worthwhileness: Calculate the mean/average of items: 3, 6, and 8 (all three items are reverse-scored*) Total score: Calculate the mean/average of Willingness, Ability, and Worthwhileness (4).

Data Analysis

In this study, the data collected from diabetic patients were evaluated using the SPSS 22.0 statistical package software. The basic statistical analysis methods, including number, percentage, mean, standard deviation, minimum and maximum, were employed. The 95% confidence interval (CI) and $p < 0.05$ were considered significant. Validity and reliability analyses were applied for the TR-MATCH scale.

Validity Analysis

- **Language validity:** The TR-MATCH scale was translated and back-translated by two translators. The language of the TR-MATCH scale was evaluated by 10 experts, including academics, nurses, and doctors. No modifications were made to the original items during the translation and back-translation process. The wording was found to be culturally and linguistically appropriate by all experts.
- **Content validity:** Content validity was assessed by 10 experts who rated each item as "appropriate," "needs revision," or "not appropriate." Based on their evaluations, the Content Validity Ratio (CVR) and Content Validity Index (CVI) were calculated following Lawshe's method. Items marked as "needs revision" were revised accordingly. No items were rated as "not appropriate." Although the MATCH scale is a previously developed instrument, content validity analysis was applied in this study to ensure that the translated items retained conceptual relevance and clarity for the Turkish older adult population. The expert evaluations were used to assess the cultural and contextual appropriateness of the items in the target population.
- **Construct validity:** The adequacy of the sample size for factor analysis was determined using the Kaiser Meyer Olkin (KMO) test. Exploratory factor analysis was conducted to establish the construct validity of the TR-MATCH scale. Exploratory factor analysis was conducted using principal component analysis with Varimax rotation. Although EFA is commonly used during initial scale development, it was employed in this adaptation study to confirm whether the original factor structure was retained in the Turkish version and to explore any cultural variations that may affect the construct dimensionality. Compliance with the theoretical framework was evaluated through confirmatory factor analysis.

Reliability Analysis

- Internal consistency analysis: Item–total correlation coefficient analysis was employed, with each item being required to exceed 0.30. This analysis indicates the compatibility of each item in the TR-MATCH scale with the whole. The item discrimination was evaluated by comparing the 27% upper and lower groups. This analysis, although more commonly applied during development, was included to provide supporting evidence of how well each item differentiates between individuals with low and high motivation levels.
- Cronbach's alpha confidence coefficient: This coefficient serves as the most crucial indicator of scale reliability, with a recommended value exceeding 0.70.

- Test-retest: The MATCH scale was re-administered to the sample after 3 weeks, with the results being required to demonstrate statistical significance.

Ethical Considerations

Prior to the commencement of this study, ethical approval was obtained from the relevant ethics committee. In addition, institutional permission was obtained from the hospital authorities. Furthermore, permission for the use of the MATCH scale was obtained from the authors who developed it. Finally, informed consent was obtained from all diabetic patients participating in the study. This study adheres to the provisions of the Declaration of Helsinki.

RESULTS

Validity Analysis

Content Validity

The content validity ratio and content validity index of the TR-MATCH scale items were found to be higher than 0.62.

Construct-Concept Validity

The Kaiser Meyer Olkin (KMO) value of the TR-MATCH scale was determined to be 0.78. According to the Bartlett test results, it was established that the data were suitable for factor analysis ($p < 0.001$). In this study, both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) were conducted to examine the psychometric properties of the TR-MATCH scale. The EFA was initially used to explore the underlying factor structure of the Turkish version. Following this, CFA was performed using AMOS 24.0 with the maximum likelihood estimation (MLE) method to test the fit of the factor structure that emerged from the EFA. The model fit was assessed using the fol-lowing indices and cut-off values: Chi-square/df (<3), comparative fit index (CFI > 0.90), Tucker–Lewis index (TLI > 0.90), and root mean square error of approximation (RMSEA < 0.10). Although the original MATCH scale provided the conceptual foundation, the CFA focused on testing the structure derived from the EFA conducted with Turkish participants, rather than directly replicating the original structure. Although the RMSEA value exceeded the desired threshold, given the favorable results of the scale's factor loadings and explained variance analyses, the RMSEA value was deemed acceptable due to the sample size. The confirmatory factor analysis (CFA) results showed that the scale has a clear three-factor structure, with satisfactory factor loadings ranging from 0.67 to 0.97, and a total variance explained of 71.87%. Item 9 had a relatively low factor loading (0.30), which may suggest weaker representation of the underlying construct; this is also reflected in its lower squared multiple correlation (0.36). Results of the confirmatory factor analysis indicated that the structural equation model of the scale was significant, with a value of $p < 0.001$, and no improvements were required in the model (Table 2, Table 3, Figure 1).

Reliability Analyses

Internal Consistency Analysis

The item means of the TR-MATCH scale ranged from 2.91 to 3.45. Item-total score correlations were found to range between 0.36 and 0.74, and all correlation coeffi-cients were statistically significant. The item analysis results indicate good internal consistency for the TR-MATCH scale, with a total Cronbach's alpha of 0.85. Corrected item–total correlations ranged from 0.47 to 0.60, showing that all items contribute adequately to overall reliability. Among these, item 7 had the highest item–total correlation (0.60), while item 6 had the lowest (0.47). The "Cronbach's Alpha if Item Deleted" values varied slightly between 0.82 and 0.83, demonstrating that removing any item would not significantly improve internal consistency. Squared multiple correlations were moderate to high for most items, with item 1 (0.74) and item 4 (0.71) performing particularly well. In contrast, item 9 had a relatively low squared multiple correlation

Table 2. MATCH Scale Factor Analysis

Scale items	Willingness	Worthwhile	Ability
I am interested in finding new ways to better manage my health problems	.89		
I am ready to do more to better manage my health problems now.	.83		
I want to find a better way to take care of my health problems.	.87		
I see little or no benefit to putting time and energy into managing my health problems now (Reverse)		.88	
Working to manage my health problems has only a little payoff or benefit (Reverse)		.83	
It is not really worth it to do all the things that I am asked to do to manage my health problems (Reverse)		.79	
I don't have enough time to take care of my health problems the way I think I should (Reverse)			.97
I am able to make the changes in my life that are needed to improve my health.			.67
I am able to fit the tasks of managing my health problems into my life.			.30
Total Variance Explained: 71.87			

Table 3. MATCH Scale Multi-Factor Model Confirmatory Factor Analysis Fit Indices.

RMESA	NFI	CFI	IFI	GFI	TLI	AGFI	CMIN	CMIN/df
0.11	0.91	0.94	0.94	0.90	0.91	0.82	66.180	2.75

*RMSEA: Root mean square error of approximation; NFI: Normed fit index; CFI: Comparative fit index; IFI: Incremental fit index; GFI: Goodness of fit index; TLI: Tucker-Lewis index; AGFI: Adjusted Goodnees of fit index; CMIN:x^2; CMIN/df :x^2/ sd.

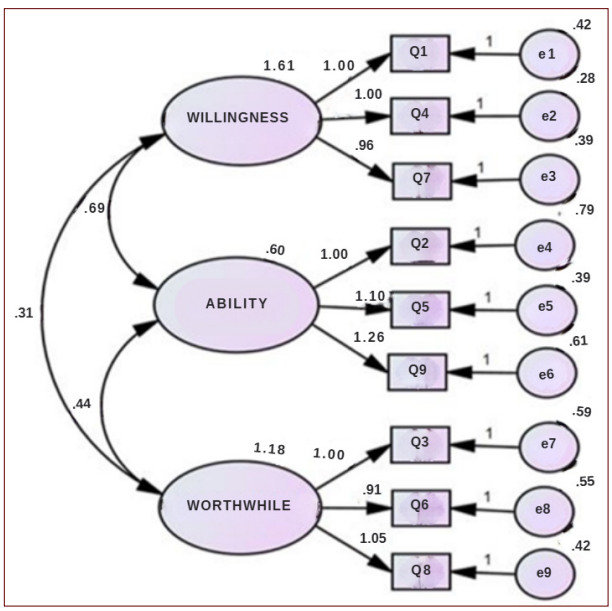

Figure 1. Confirmatory factor analysis model

(0.36), indicating that it may be less aligned with the underlying construct. Although all items met the accepted psychometric criteria, items 6 and 9 may require further investigation in future studies to optimize the scale's measurement properties. Additionally, there was a statistically significant difference between the upper and lower groups for each item on the scale ($p < 0.001$), indicating strong item discrimination (Table 4).

Test-Retest

The test-retest reliability of the TR-MATCH scale was assessed by re-administering the scale to 41 participants after a three weeks interval. The Pearson correlation coefficient between the two administrations was $r = 0.98$ ($p < 0.001$), indicating a strong positive correlation. Additionally, the intraclass correlation coefficient (ICC) was calculated

using a two-way mixed-effects model with absolute agreement. The ICC value was 0.978 (95% CI: 0.955–0.989), demonstrating excellent test-retest reliability.

DISCUSSION

Making and maintaining behavioral changes in diabetes management can prove challenging. Given that individuals with diabetes must contend with the condition for the duration of their lives, along with the associated responsibilities of effective disease management, it can become overwhelming. Diabetes distress encompasses the negative emotions experienced by people with diabetes, including emotional stress, behavioral difficulties, and ongoing concerns related to the burden of self-management. This can be particularly challenging for older individuals. Assessing diabetic patients' knowledge, distress levels, perceived abilities, attitudes, and motivation for behavioral changes is crucial to help them navigate this challenging process (4,14,17). The application of the TR-MATCH scale in an older adult population offers valuable insights into the motivational barriers that may hinder diabetes self-management in this age group. Older adults often face unique challenges, including physical limitations, cognitive decline, and long-standing habits, which can affect their readiness and ability to adopt behavioral changes (3,7–9). By assessing three critical components willingness, ability, and perceived worthwhileness the TR-MATCH scale helps identify specific motivational gaps that may not be readily observable in standard clinical assessments. For instance, an older adult may express willingness but score low in perceived ability due to age-related health concerns or past failed attempts at behavior change. Conversely, some may have the ability but question the value or relevance of new health behaviors at an advanced age. Understanding these nuances can allow healthcare providers to tailor interventions more effectively,

Table 4. Item Analysis Based on Lower and Upper Groups.

Scale items		n	Mean± SD	t (p)
Item 1	Lower group	37	2.13±1.20	-8.242
	Upper group	37	4.24±0.98	(p<0.001)
Item 2	Lower group	37	1.86±0.85	-8.233
	Upper group	37	3.67±1.02	(p<0.001)
Item 3	Lower group	37	2.10±1.17	-8.459
	Upper group	37	4.02±0.72	(p<0.001)
Item 4	Lower group	37	1.94±1.12	-9.819
	Upper group	37	4.13±0.75	(p<0.001)
Item 5	Lower group	37	1.89±0.77	-9.994
	Upper group	37	3.75±0.83	(p<0.001)
Item 6	Lower group	37	2.08±1.03	-8.934
	Upper group	37	3.97±0.76	(p<0.001)
Item 7	Lower group	37	1.83±0.98	-11.349
	Upper group	37	4.24±0.83	(p<0.001)
Item 8	Lower group	37	2.43±1.28	-7.869
	Upper group	37	4.29±0.66	(p<0.001)
Item 9	Lower group	37	1.70±1.05	-8.005
	Upper group	37	3.83±1.23	(p<0.001)

* p<0.001.

emphasizing realistic goal setting, supportive communication, and reinforcing the personal relevance of diabetes self-care. Therefore, the TR-MATCH scale not only serves as a psychometric tool but also enhances patient-centered care by aligning educational content with motivational readiness in older adults (19). This study conducted psychometric research on the Turkish Motivation and Attitudes Toward Health Changing Health scale to provide support by focusing on the motivation and attitude dimension of the challenging process experienced by diabetic patients. The language validity of the TR-MATCH scale was confirmed through translation, back-translation, expert opinion, and pilot testing.

The content validity of the TR-MATCH scale was assessed using expert opinions, confirming that the items effectively capture the relevant motivational constructs for health behavior change in individuals with diabetes. The high content validity index supports the scale's ability to accurately measure these factors, reinforcing its relevance and applicability for this population. Confirmatory factor analysis results provided empirical support for the theoretical structure of the scale, suggesting that the adapted Turkish version aligns well with the original conceptual framework. The KMO value of 0.78 indicates that the sample size was adequate for conducting factor analysis, albeit at a moderate level. This finding reinforces the statistical appropriateness of the dataset for structural modeling. Additionally, the significance of the Bartlett's test value ($p < 0.001$) confirmed the presence of sufficient correlations among the items to justify the use of factor analysis. Together, these results strengthen the construct validity of the TR-MATCH and support its use as a theoretically grounded tool for assessing motivational constructs in health behavior change. The three-factor structure identified in the Turkish adaptation of the MATCH scale explained 72% of the total variance, which indicates a strong representation of the construct by the scale items. This percentage is notably higher than that reported in the original study by Hessler et al., where the three-factor solution accounted for 61.5% of the variance and factor loadings ranged from 0.60 to 0.92 (4). The higher ex-plained variance in the current study suggests that the Turkish version of the scale may demonstrate a robust factor structure within this population, potentially reflecting a strong conceptual clarity and cultural relevance of the constructs in the Turkish context. This finding supports the cross-cultural applicability of the MATCH scale and its consistent dimensional integrity across different populations. The confirmatory factor analysis in this study indicated that the structural equation model of the TR-MATCH scale was meaningful and aligned with previous findings, supporting the validity of the scale. While the RMSEA value was slightly above the traditional cutoff, this may be influenced by the small sample size, as smaller samples tend to produce higher RMSEA values. Despite this, the other fit indices, such as CFI and SRMR, were at acceptable levels, suggesting that the model fit is still adequate. This reinforces the scale's robustness, even in the context of a smaller sample, and supports its applicability for further use in similar studies (19). In this study, the item–total score correlations of the Turkish version of the Motivation and Attitudes Toward Changing Health (TR-MATCH) scale were found to range between 0.36 and 0.74, with all correlations being statistically significant. Additionally, a significant difference was observed between the upper and lower groups of items on the scale ($p < 0.001$), indicating good discriminant validity. These findings are consistent with the results from Hessler et al.'s study, where correlations between the sub-dimensions of the scale ranged from $r = \pm 0.22$ to $r = \pm 0.35$. The Cronbach's alpha for the TR-MATCH scale in the current study was 0.85, suggesting good internal consistency. In comparison, Hessler et al. reported lower Cronbach's alpha values for the sub-dimensions, with 0.69 for the willing-ness sub-dimension, 0.74 for the ability sub-dimension, and 0.61 for the worthwhileness subdimension.

Despite these lower values, Hessler et al. (2018) recommended the scale's use in interventional studies aimed at improving motivation and attitudes in individuals with chronic diseases like diabetes, highlighting its utility in fostering behavioral change and promoting better disease management. The overall consistency of the TR-MATCH scale in this study supports its reliability and potential for use in similar contexts, includ-ing diabetes care.

Clinical Use of the TR-MATCH Scale

The Turkish version of the Motivation and Attitudes Toward Changing Health (TR-MATCH) scale offers valuable insights into the motivational factors that influence health behavior change in individuals, particularly those with chronic conditions such as diabetes. Given the challenges in diabetes self-management, especially in older adults, the TR-MATCH scale can be used in a variety of clinical settings to assess and address spe-cific barriers to motivation, attitudes, and readiness for change. Below follow some key practical applications of the scale in clinical practice.

Identifying Motivational Barriers in

The TR-MATCH scale helps healthcare providers pinpoint specific motivational factors that can either facilitate or hinder self-management behaviors in people with diabetes. It evaluates three core components: willingness, ability, and perceived worthwhileness. These dimensions can offer a deeper understanding of why a diabetic patient may be struggling with their diabetes care.

In case a healthcare professional encounters an elderly patient struggling to adhere to dietary recommendations, the TR-MATCH scale could be administered to assess the patient's motivation and attitudes toward behavior change, particularly in relation to diabetes management. The results could reveal that the diabetic patient is highly willing to make chang-es (high willingness score) but scores lower on ability due to physical limitations or lack of confidence in their ability to prepare meals. This insight allows the clinician to offer targeted support, such as providing meal planning tools or referring the diabetic patient to a nutritionist for tailored advice.

Tailoring Interventions Based on Motivational Readiness

With the results from the TR-MATCH scale, clinicians can tailor interventions to match the individual's specific motivational needs. For example, diabetic patients with low willingness but high ability may require interventions focused on increasing motivation, while those with high willingness but low ability may benefit from skill-building or confidence enhancing strategies.

In cases where a diabetic patient scores low on the "willingness" subscale, motivational interviewing (MI) may be utilized to explore the reasons behind their resistance to change and identify potential barriers to behavior modification. MI techniques can help the patient articulate their concerns and build motivation to engage in diabetes management behaviors, such as regular exercise and blood sugar monitoring.

Setting Realistic and Personalized Goals

The scale's ability to assess perceived worthwhileness can help clinicians understand whether diabetic patients view the proposed behavioral changes as worthwhile. This can be crucial in setting realistic and personalized goals that align with the patient's values and life circumstances.

For example, an elderly diabetic patient may feel that adopting a rigorous exercise regimen is not worth the effort due to age-related fatigue. A clinician using the TR-MATCH scale may learn that, while the diabetic patient does not value traditional exercise, they might be more open to light physical activities, such as walking or chair exercises. The clinician could set a goal for the diabetic patient

to engage in 10 min of walking daily, which is more feasible and personally meaningful for them.

Monitoring Progress over Time

The TR-MATCH scale can be used as a tool for tracking changes in motivation and readiness for health behavior change over time. By administering the scale at multiple time points, healthcare providers can assess the effectiveness of interventions and make adjustments as necessary.

In case an intervention (e.g., a diabetes education program or telehealth support) has been implemented, the clinician may reassess the diabetic patient using the TR-MATCH scale to evaluate any changes in motivation and attitudes toward health behavior. A positive shift in the willingness or ability scores may indicate that the diabetic patient is becoming more motivated and empowered to manage their condition, whereas stagnation in these scores may suggest that the intervention needs to be adjusted or intensified.

Identifying Psychological and Emotional Barriers

In addition to motivation, the TR-MATCH scale also provides insight into the psychological and emotional aspects of diabetes self-management. For example, older adults may experience diabetes distress, which can negatively impact their willingness and ability to engage in health behaviors. The scale can help identify such distress, which might not always be obvious during routine clinical assessments.

For example, a diabetic patient who reports chronic fatigue or feelings of helplessness regarding their condition might have a low perceived worthwhileness. The TR-MATCH scale would help the clinician identify these emotional barriers and prompt them to offer emotional support, such as counseling or mental health resources, to address these underlying issues.

Supporting Multidisciplinary Care Teams

The TR-MATCH scale can also serve as a tool for multidisciplinary healthcare teams working with patients who have diabetes. By using the scale's results, different team members such as endocrinologists, nurses, dietitians, and psychologists can develop a coordinated plan to address various aspects of the patient's self-management.

For example, if a diabetic patient exhibits low willingness to engage in insulin therapy but demonstrates high perceived ability, the healthcare team may involve a diabetes educator to enhance the diabetic patient's motivation and understanding of insulin usage. At the same time, a dietitian may focus on teaching the diabetic patient how to adjust their meals according to insulin therapy.

Improving Patient-Provider Communication

The TR-MATCH scale fosters open communication between diabetic patients and providers by offering a structured framework for discussing the barriers to behavior change. The scale's clear categorization of willingness, ability, and worthwhileness allows diabetic patients to express their concerns, and clinicians can respond more effectively to these concerns with empathy and specific solutions.

In case a clinician observes that a diabetic patient is very willing to improve their diet but has concerns about their ability to make those changes due to time constraints, they might ask, "I see that you're very willing to improve your diet but have concerns about your ability to make those changes due to time constraints. Let's talk about how we can work within your schedule to find a diet plan that fits your life." This approach demonstrates that the clinician is listening to the patient's concerns and is prepared to collaborate in creating a realistic plan.

In this context, the TR-MATCH scale offers a practical and patient-centered tool for understanding the motivational dynamics in chronic disease management, contributing to the development of personalized, multidisciplinary care

strategies and the support of sustainable health behavior change.

LIMITATION

There are several limitations in this study. First, the sample size used in this study may limit the generalizability of the findings. Future research with larger and more diverse samples could enhance the validity of the results. Additionally, the instrument was tested in a specific group, and it is possible that the results may differ in populations of varying age, gender, or socio-economic status. Therefore, it is recommended that similar analyses be conducted in diverse populations in future studies. This study was conducted in a specific geographical region, further research is needed to explore the applicability of the findings in other cultural contexts. A limitation of this study is the small sample size (n = 100), which may have contributed to the relatively high RMSEA value. RMSEA values tend to be higher in small samples (19). Despite other fit indices showing acceptable levels, the small sample size may limit the generalizability of the findings. Larger samples are needed for more robust conclusions. In addition, although modification indices were reviewed during confirmatory factor analysis, no error terms were correlated solely based on statistical criteria. To preserve the theoretical structure of the original scale, no post hoc modifications were applied. However, future studies with larger samples may consider correlating certain error terms based on strong conceptual justification to improve model fit. Also one limitation of this study is that, although participants were observed by the researchers for signs of cognitive impairment, no standardized cognitive screening tools were used. The lack of formal cognitive assessment may have influenced participants' responses related to motivation and should be addressed in future studies through the use of validated cognitive evaluation method. Cut-off values were adopted from the original scale. However, no ROC analysis was conducted to validate these thresholds within the Turkish context. This limits the cultural specificity of interpretations based on cut-off scores.

CONCLUSION

This study provides strong evidence for the validity and reliability of the Turkish version of the Motivation and Attitudes Toward Changing Health (TR-MATCH) scale in older individuals with type 2 diabetes. The scale's high internal consistency and test-retest reliability indicate its robustness for assessing motivation and attitudes toward behavioral change regarding health in this population. Additionally, the study contributes to the existing literature by adapting and validating a tool that can be used in clinical and outpatient settings to guide interventions for diabetes management in older adults.

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Institutional Review Board Statement: The study was conducted in accordance with the Decla-ration of Helsinki, and approved by the Ethics Committee of Dokuz Eylul University Non-Interventional Research (protocol code 2020/09-04 and date of approval 11.05.2020).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study. Written informed consent has been obtained from the patient(s) to publish this paper.

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