

Turkish validation of the CompACT: assessing psychological flexibility among emergency aid and disaster management students

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Abstract

Psychological flexibility is a central construct in Acceptance and Commitment Therapy and an important protective factor for mental health, particularly among individuals expected to function effectively under high stress and uncertainty, such as those in emergency aid and disaster management. Despite its relevance for this population, no Turkish version of the Comprehensive Assessment of Acceptance and Commitment Therapy Processes (CompACT) had been available. The present study aimed to perform a cross-cultural adaptation of the English version of CompACT into Turkish and to evaluate its psychometric properties in emergency aid and disaster management students. The study was conducted in two phases: translation and cross-cultural adaptation, followed by psychometric evaluation in a sample of 302 students. Data were analysed using SPSS v.21 and AMOS v.22 through exploratory and confirmatory factor analyses, reliability analyses, test-retest analysis, and correlational validity testing. The exploratory factor analysis (EFA) showed that the CompACT consisted of 3 factors (Openness to Experience, Behavioral Awareness, and Valued Action) explaining 75.848% of the total variance, comprising 20 items. Confirmatory factor analysis (CFA) showed that the three-factor model provided the best fit to the data ($\chi^2/df = 2.590$, CFI = 0.963, TLI = 0.956, RMSEA = 0.073). The scale demonstrated satisfactory internal consistency (overall alpha = 0.843) and temporal stability (test-retest $r > 0.70$ across all subscales), and its expected negative associations with the Acceptance and Action Questionnaire-II ($r = -.365$) and the Depression Anxiety Stress Scales-21 ($r = -.403$) supported its criterion-related validity.

Keywords: CompACT, psychological flexibility, reliability, validity, Türkiye.

1. Introduction

Psychological flexibility is a core construct in Acceptance and Commitment Therapy (ACT) and in broader process-based approaches to mental health (Hayes and Hofmann 2020). It refers to the capacity to contact present-moment experiences openly and without unnecessary defence, while persisting in or adjusting behaviour in service of personally chosen values—even in the presence of difficult thoughts, emotions, or bodily sensations (Hayes et al. 2006; Kashdan and Rottenberg 2010; Hayes et al. 2012). This construct has become increasingly important in contemporary research: greater psychological flexibility has been consistently associated with lower levels of depression, anxiety, stress, and insomnia, as well as higher well-being and adaptive functioning (Daks et al. 2020; Howell and Demuynck 2021; McCracken et al. 2021; Wang et al. 2023). Recent work has further clarified that psychological flexibility is conceptually related to, yet empirically distinct from, resilience, and may be especially relevant in situations requiring sustained adaptation under prolonged or acute pressure (Jo et al. 2024).

These features are especially important in the context of emergency assistance and disaster management. Disaster response workers work in a context of uncertainty, time pressure, repeated exposure to human suffering and possible traumatic events. This occupational exposure has been consistently shown to increase the risk of post-traumatic stress disorder (PTSD), depression, anxiety, burnout and secondary traumatic stress (Benedek et al. 2007; Berger et al. 2012; Brooks et al. 2018; Carmassi et al. 2020). Success in such environments requires technical skills, but also the ability to manage emotional responses, stay attuned to the situation, and act in a manner that is consistent with values in high-stress situations. In military and first responder samples,

psychological flexibility has been shown to be a protective factor against post-traumatic stress symptoms and depression (Bryan et al. 2015), and interventions designed to enhance well-being and resilience in first responders have highlighted the role of adaptive psychological processes in maintaining functional capacity in the face of occupational stress (Wild et al. 2020). Increased psychological flexibility has also been linked to reduced psychological distress and more adaptive coping in large-scale crises like the COVID-19 pandemic (Pakenham et al. 2020). Moreover, Kashdan et al. (2020) found that people with higher levels of psychological flexibility were better able to achieve their valued goals even when they were experiencing high levels of distress, which is directly relevant to the demands of disaster response work.

This is also a concern at the pre-professional level. The educational pipeline for future disaster response personnel is the students enrolled in emergency aid and disaster management programmes. These students are socialized into professional roles that require crisis decision-making, quick adaptation, and operating in uncertain and threatening environments during their training. Pre-professional training environments have been identified as suitable and valid settings for validating occupationally relevant psychological measures because they allow for assessment in a setting of role socialization and anticipatory stress that is similar, but not identical, to the demands of the profession (Daks et al. 2020). Conceptually, therefore, it is meaningful to assess psychological flexibility at this stage, as it could be used to identify strengths and vulnerabilities prior to field deployment, to evaluate curricula that aim to prepare students for high stress occupations, and to inform preventive mental health interventions for people entering occupations related to disaster. Thus, while students are not the same as active disaster workers, they are a theoretically relevant group for the initial testing of instruments that will be used in disaster-related settings.

To this end, it is imperative to assess the psychological flexibility of disaster response workers, evaluate the results, and implement appropriate precautions based on the findings. A multitude of psychological flexibility scales have been documented in the extant literature.

The Acceptance and Action Questionnaire-II (AAQ-II) (Bond et al. 2011) is the most widely used measure of psychological flexibility and is brief and has been extensively cross-culturally validated. The AAQ-II is a unidimensional questionnaire that emphasises experiential avoidance and psychological inflexibility, however, rather than the entire spectrum of ACT processes. Empirical issues have been raised that AAQ-II scores are highly correlated with general negative affect and psychological distress, which reduces the discriminant validity and specificity of AAQ-II as a measure of flexibility alone (Wolgast 2014; Rochefort et al. 2018; Tyndall et al. 2019).

The Multidimensional Experiential Avoidance Questionnaire (MEAQ) (Gamez et al. 2011) provides a more comprehensive and nuanced measure of avoidance-related-processes in six subscores. It is a 62-item instrument, however, which creates a significant burden on the respondent and is not feasible for field research or routine screening. It is similar to the AAQ-II in that it emphasises avoidance and inflexibility, but not the entire range of processes that foster flexibility.

The Multidimensional Psychological Flexibility Inventory (MPFI) (Rolffs et al. 2018) covers both flexibility and inflexibility dimensions and is conceptually congruent with the ACT hexaflex model. The 60-item version, however, is quite burdensome for the respondent and there are relatively few validations in non-English speaking populations. Although shortened versions have been developed (Rogge et al. 2019), their cross-cultural applicability is still being established.

These limitations are amplified in disaster and emergency contexts specifically. In field-based or educational settings associated with disaster response, instruments must satisfy particularly stringent practical constraints: they must be sufficiently brief to administer under time pressure, yet multidimensional enough to differentiate among the specific ACT processes—acceptance, present-moment awareness, and values-based action—that are theoretically implicated in adaptive functioning under trauma exposure. A measure that conflates flexibility with general distress, or that captures only one facet of the flexibility–inflexibility continuum, may fail to detect the specific psychological processes that distinguish resilient from at-risk individuals in disaster-related populations. The unidimensionality of the AAQ-II, the length of the MEAQ and MPFI, and the limited cross-cultural validation of the MPFI's shorter versions collectively point to the need for a brief, theoretically comprehensive, and cross-culturally validated measure of psychological flexibility suitable for use in these contexts.

For these reasons, the CompACT (Francis et al. 2016) is a particularly promising candidate. The CompACT is a 23-item multidimensional instrument that assesses three higher-order domains: Openness to Experience (reflecting acceptance and cognitive defusion), Behavioral Awareness (reflecting present-moment contact and self-as-context), and Valued Action (reflecting values clarification and committed action). Together, these domains encompass all six core ACT processes in a parsimonious and practically usable format, without the item redundancy or excessive length of longer alternatives. In a narrative scoping review of 27 instruments related to psychological flexibility and rigidity, Cherry et al. (2021) identified the CompACT as one of the strongest available measures in terms of conceptual breadth and psychometric quality. Compared with the AAQ-II, the CompACT moves beyond a narrow focus on experiential avoidance and demonstrates stronger discriminant validity from general distress. Compared with the MEAQ and the full MPFI, it provides a shorter and more feasible format while retaining multidimensional coverage across the core ACT processes. These properties make the CompACT particularly well-suited for research with populations where both comprehensiveness and brevity are essential—such as disaster management students and professionals.

Since its original development and validation (Francis et al. 2016), the CompACT has been cross-culturally adapted and validated in multiple languages and cultural contexts, with studies consistently supporting its three-factor structure, internal consistency, and convergent and discriminant validity (Hajloo et al. 2022; Musa et al. 2022; Sugando and Abidin 2022; Ptáček and Jelínek 2024; Zhao et al. 2024; Morey et al. 2025). This growing body of cross-cultural evidence strengthens the generalisability of the CompACT and demonstrates its applicability across diverse populations. However, no Turkish version of the CompACT has been available to date.

The absence of a Turkish CompACT represents a significant gap for both research and practice. In Türkiye, the primary instrument available for assessing psychological flexibility has been the Turkish adaptation of the AAQ-II (Yavuz et al. 2016), which has been widely used in clinical and non-clinical samples. However, as noted above, the AAQ-II is unidimensional, focused on experiential avoidance, and may conflate flexibility with general negative affect. Other Turkish-adapted measures, such as the brief Psychological Flexibility Scale (Karakuş and Akbay 2020), provide limited coverage of the specific processes central to ACT. Consequently, Turkish researchers and practitioners have lacked access to a comprehensive, multidimensional, ACT-consistent measure of psychological flexibility. This constrains the ability to conduct theoretically nuanced research, to compare findings with the growing international ACT literature, and to evaluate ACT-based interventions in Turkish educational and disaster-related settings. Cross-

cultural adaptation is also necessary because item meaning, particularly for constructs involving emotional openness, self-observation, and values-based action, may shift substantially across linguistic and cultural contexts.

Accordingly, the present study aimed to translate and culturally adapt the CompACT into Turkish and to conduct a preliminary psychometric evaluation among students enrolled in emergency aid and disaster management programmes. This population was selected as a theoretically relevant pre-professional group whose anticipated occupational demands render psychological flexibility particularly salient and assessment of this construct especially meaningful. The study was designed to address the following hypotheses:

H1. The Turkish version of the CompACT will reproduce the original three-factor structure consisting of Openness to Experience, Behavioral Awareness, and Valued Action.

H2. The Turkish CompACT total score and subscale scores will demonstrate satisfactory reliability, including internal consistency and short-term test–retest stability.

H3. Higher scores on the Turkish CompACT will be negatively associated with psychological inflexibility and distress, as indexed by the Acceptance and Action Questionnaire-II (AAQ-II) and the Depression Anxiety Stress Scales-21 (DASS-21), supporting construct validity.

By addressing these hypotheses, the study seeks to provide an empirically grounded Turkish measure of psychological flexibility that is theoretically coherent, practically feasible, and suitable for research and applied assessment with individuals preparing for disaster-related work.

2. Methodology

This study used a cross-sectional data collection method to test the results of the psychometric properties of the Turkish version of The CompACT scale on emergency aid and disaster management students.

2.1. Population and sample of the study

The universe of this study is the students studying in the emergency aid and disaster management undergraduate departments at universities in Türkiye. In total, 13,848 students are enrolled in this department as of 2025. It aimed to apply the survey to 350 samples determined by the convenience sampling method from this universe. For several practical reasons, convenience sampling was chosen: (1) the study was not funded by an external source, and the researchers' ability to reach geographically dispersed institutions across Türkiye was limited; (2) the researchers had existing institutional affiliations and access at three state universities offering this programme; and (3) formal administrative permissions from a large number of institutions across Türkiye would have posed logistical challenges within the timeframe of the study. Convenience sampling reduces the generalisability of the results to the larger population of emergency aid and disaster management students in Türkiye, but is a widely used method in scale adaptation studies that have similar limitations (Polit and Beck 2010). Future research should aim to replicate these results with probability sampling methods to increase external validity.

The inclusion criteria for participation were: (1) active enrollment in an undergraduate emergency aid and disaster management programme, (2) age 18 years or older, and (3) voluntary informed consent to participate. Exclusion criteria were: (1) age under 18 years and (2) refusal to participate voluntarily. Further exclusions were made at the data screening stage: surveys with more than 5% missing data per questionnaire and those with response patterns that suggested

random responding (e.g., the same answer for all items or implausible response patterns) were excluded from the data set.

Data were gathered from 15 March 2025 to 30 April 2025, either in a classroom or online. Students from the emergency aid and disaster management departments of three state universities were reached and a total of 381 students were contacted. The total time to complete the entire survey was between 6 and 13 minutes for participants. Of the 381 surveys collected, 79 were excluded from analysis due to excessive missing data (61) or apparent random responding (18), leaving a final analytical sample of 302 participants. The demographic data of the participants are shown in Table 1.

As for sample size for the multivariate analyses used in this study, there are various criteria in the literature, but it is generally recommended that the number of participants be at least five times the number of scale items (Bentler and Chou 1987; Tabachnick and Fidell 2013). The CompACT scale in this study has 23 items and the final sample size of 302 is about 13 times the number of items, which is deemed adequate.

2.2. Ethical Statement

This study was conducted in accordance with the ethical standards of the institutional research committee and with the 1964 Helsinki Declaration and its later amendments. Ethical approval for this research was obtained from the XX University Ethics Committee (Code: BS9BNDY28C, Issue: E45796069-204.01.07-266356, Date: 14.03.2025). Informed consent was obtained from all participants prior to their participation in the study. Participation was entirely voluntary, and participants were informed about the study's purpose, procedures, potential risks, and their right to withdraw at any time without penalty. Written informed consent was collected from each participant between 15 March 2025 and 30 April 2025, in both classroom settings and online, via an online survey platform. No identifying information of participants was collected, and data were used solely for research purposes. All participants were adults, and no minors or legally dependent individuals were included.

2.3. Measures

The present study used three different scales. The scales used are listed below.

Comprehensive Assessment of Acceptance and Commitment Therapy (CompACT)

Francis et al. (2016) created the CompACT scale to measure psychological flexibility as defined in Acceptance and Commitment Therapy (ACT). It is a 23-item, three-factor scale that measures: (1) Openness to Experience (willingness to accept internal experiences without unnecessary defence); (2) Behavioral Awareness (the degree to which behaviour is guided by present-moment awareness); and (3) Valued Action (commitment to behaviours that are aligned with personal values). The items are rated on a 7-point Likert-type scale from 1 (Strongly Disagree) to 7 (Strongly Agree), and the total scores range from 23 to 161. The higher the score, the more psychologically flexible.

There are 23 items, 12 of which are reverse-scored, with higher raw scores on these items indicating lower psychological flexibility. These items were reverse coded before analysis, with higher total scores indicating higher psychological flexibility on all items. The scale had good internal consistency in the original validation study (Cronbach's $\alpha = 0.91$) (Francis et al. 2016). The full Turkish CompACT item list is provided in Supplementary Table S1 and is also openly available on the Open Science Framework (OSF; Folder 9: "CompACT Items [Turkish]"). The

CompACT was translated and adapted into Turkish after obtaining written permission from the original scale developers (Francis et al. 2016). The scale is also noted to be an open-access measure for clinical and research purposes.

Acceptance and Action Questionnaire-II (AAQ-II)

Bond et al. (2011) developed AAQ-II, the most widely used scale to measure psychological flexibility. AAQ-II is a single-dimensional 7-item scale that measures only the experiential avoidance sub-dimension of psychological flexibility (Hayes et al. 2012). It has been observed that AAQ-II has a higher correlation with psychological distress and negative emotions than measuring psychological flexibility (Rocheffort et al. 2018). The original scale developed by Bond et al. (2011) was used in the present study. In the original study, the scale's average Internal reliability value (Cronbach alpha) was found to be 0.84. In the present study, the internal consistency value of AAQ-II was 0.979. In the present study, a Likert-type scale that ran from 1 (never true) to 7 (always true) was used, with higher scores indicating greater levels of psychological inflexibility.

The original English version of the AAQ-II was translated into Turkish with the same systematic translation procedure used for the CompACT (see Section 2.5) instead of using an existing Turkish version. This was done because of the following reasons: (1) the translation methodology applied to all instruments in this study was standardised to ensure linguistic and cultural uniformity; and (2) formal permission from the authors of the existing Turkish versions was not possible within the time frame of the study. It is recognised that this is a limitation of the study, since the psychometric characteristics of the translated versions of the AAQ-II and DASS-21 used in this study have not been validated independently in Turkish. In addition, CFA was not performed separately for the AAQ-II and DASS-21 in this study, as these instruments were not the primary focus of the study, but rather were used to provide convergent and divergent validity evidence for the CompACT.

Depression Anxiety Stress Scale-21 (DASS-21)

This study used the DASS-21, the short-form version of the Depression Anxiety Stress Scales originally developed by Lovibond and Lovibond (1995), with construct validity and normative data for the 21-item short form provided by Henry and Crawford (2005). This scale is a distress measure assessing three separate constructs (Depression, anxiety, and stress). In the study conducted by Henry and Crawford (2005), the total internal reliability value (Cronbach alpha) of the scale was found to be 0.93. In the present study, the internal consistency value of DASS-21 was 0.971. The scale contains 21 items, 7 of which measure stress, 7 of which measure anxiety, and 7 of which measure depression. In the present study, each item is scored from 1 (did not apply to me at all over the past week) to 4 (applied to me very much or most of the time over the past week). Higher scores indicate greater levels of distress.

2.4. Data analysis

SPSS v.21 (Statistical Package for the Social Sciences) and AMOS v.22 (Analysis of Moment Structures) programs were used to analyse this research. Frequency and percentage statistics were used to describe the demographic characteristics of the participants. The distributional properties of the data were evaluated by the skewness and kurtosis coefficients. The Turkish CompACT was subjected to EFA to explore the underlying factor structure and CFA was then used to test the fit of the proposed three-factor model.

It is recognised that the use of the same data set for both EFA and CFA is a methodological limitation because it may overestimate the model fit estimates (Floyd and Widaman 1995). Ideally, the sample should have been randomly divided into two independent samples for EFA and CFA. The total sample size was 302, however, dividing the sample into two groups would have resulted in each group having about 150 participants, which is too small to provide stable and reliable factor solutions, especially for CFA, which typically requires larger samples to provide trustworthy fit indices (Kline 2016). Hence, EFA and CFA were performed on the entire data set and this restriction is clearly stated.

Measurement invariance across subgroups such as gender and academic year was not examined in the present study, which constitutes an additional limitation. It remains unknown whether the Turkish CompACT functions equivalently across these groups. Future research should address this gap by conducting multi-group confirmatory factor analysis to test for configural, metric, and scalar invariance (Vandenberg and Lance 2000).

For validity and reliability assessment, the following procedures were employed: test-retest reliability (Pearson correlation), composite reliability (CR), average variance extracted (AVE), maximum shared variance (MSV), heterotrait-monotrait (HTMT) ratio, Cronbach's alpha (α), and McDonald's omega (ω). Convergent and divergent validity were assessed using Pearson correlation coefficients between the CompACT and the AAQ-II and DASS-21. A 95% confidence interval was applied throughout all analyses.

2.5. Translation process

The Turkish adaptation of the CompACT was carried out in accordance with the cross-cultural adaptation guidelines proposed by Beaton et al. (2000) and in alignment with the principles outlined in the Standards for Educational and Psychological Testing (American Educational Research Association et al. 2014). Together, these frameworks support a sequential, multi-stage adaptation process designed to ensure semantic, idiomatic, experiential, and conceptual equivalence between the original and adapted versions, while also strengthening evidence based on test content, response processes, internal structure, and relations to other variables. The same procedure was applied in parallel to the AAQ-II and DASS-21. The adaptation process comprised the following stages:

Stage I — Forward Translation: Three academics fluent in both English and Turkish independently translated the original CompACT into Turkish. Two of these translators were specialists in emergency aid and disaster management, and one was a specialist in English language and literature. This multidisciplinary composition was intentional, ensuring that both linguistic precision and domain-specific content relevance were considered simultaneously.

Stage II — Synthesis of Translations: The three translators met and compared their translations line by line. The differences in wording, tone and conceptual meaning were discussed in a systematic manner and a single consensus Turkish version was created through collaborative deliberation.

Stage III — Back-Translation: The synthesized Turkish version was then independently translated back into English by the same three academics, without reference to the original English scale. This was done to ensure that the meaning and intent of the original items were preserved in the Turkish version.

Stage IV — Expert Committee Review: The back-translated version was compared with the original English scale by the research team to assess the level of semantic, idiomatic, experiential and conceptual equivalence at the item level as suggested by Beaton et al. (2000). The differences found in this comparative review were discussed and the Turkish version was revised as needed.

Stage V — Cognitive Debriefing: A structured session was held with 15 undergraduate students studying emergency aid and disaster management to assess the comprehensibility and cognitive equivalence of the pre-final Turkish draft. This process is similar to the pre-testing phase outlined by Beaton et al. (2000) where the modified instrument is given to a small sample of the target population to determine the clarity of the items. Each participant was asked to read each item and explain the meaning of each in their own words, and to note if any items were unclear, ambiguous, or difficult to interpret. The results of this session indicated that there were some minor linguistic adjustments that needed to be made in a few items. For example, one item that included an abstract psychological construct was reworded in more common everyday language after several participants had trouble understanding the meaning of the item. One item was simplified syntactically because participants reported that it was cognitively demanding and slowed their reading. The pre-final version of the scale was used for the pilot study, which included these revisions.

Stage VI — Pilot Testing and Finalisation: After the cognitive debriefing revisions, a pilot study was conducted with 40 undergraduate students, as detailed in Section 2.6. Final minor changes were made based on the feedback received in the pilot study and the scale was formally finalised.

2.6. Pilot study

Before starting the actual field research of the draft scale, it is necessary to conduct a pilot study to prevent possible problems by trying the sample-finding method, survey application methodology, data collection, and entry method in advance (Ruel et al. 2015). For this purpose, a convenience sample of 40 undergraduate students from an emergency aid and disaster management programme was recruited. The pilot participants were entirely separate from the main study sample and were not included in the final analytical dataset of 302 participants. The pilot survey was conducted face-to-face with the researchers, enabling the researchers to observe the participants and collect verbal feedback immediately.

In the pilot study, some problems were found and rectified before the main data collection. For instance, two of the Turkish CompACT items were identified by several participants as being awkward in terms of grammar, and the wording was changed to make them more natural and fluent. In addition, one item from the translated DASS-21 was found to be ambiguous in its temporal reference, namely the item corresponding to "over the past week," which was reworded to make the intended time reference clear. In terms of administration of the survey, it was noted that some participants were hesitant to switch between scales with different response options (e.g., the 7-point scale of the CompACT and AAQ-II and the 4-point scale of the DASS-21). To overcome this, a short instruction note was added at the start of each scale to alert participants to the different response options. The total time needed to fill out the entire survey was between 5 and 11 minutes for each participant, which was deemed appropriate, and no changes to the length of the survey were deemed necessary.

3. Results

3.1. Participant characteristics

Table 1 shows the demographic characteristics of 302 participants. The majority of the participants were male (50.7%), senior grade (28.5%), unemployed (90.1%), urban area residents (73.5%), and had a family income of 23,001-76,000 TL (65.6%) (detailed data available via OSF, Folder 1).

Table 1.

Demographic Characteristics of the Participants

Variable	Category	n	%
Gender	Male	153	50.7
	Female	149	49.3
Grade	Freshmen	70	23.2
	Sophomores	66	21.9
	Junior	80	26.5
	Senior	86	28.5
Employment Status	Employed	30	9.9
	Unemployed	272	90.1
Family Residence	Urban	222	73.5
	Rural	80	26.5
Family Income	0–23,000 TL	71	23.5
	23,001–76,000 TL	198	65.6
	76,001 TL and above	33	10.9

Note. n = 302.

3.2. Distribution analysis

Whether the data in the study show normal distribution can be tested using skewness and kurtosis coefficients (Hayran and Hayran 2011). According to Joanes & Gill (1998), a value between -3 and $+3$ is sufficient for normal distribution. Outliers were examined in the study's data set, and no outliers were found. As a result of the skewness (0.382–2.253) and kurtosis (0.010–2.024) coefficients, it was found that the data showed normal distribution (detailed data available via OSF, Folder 2).

3.3. Item-Total Statistics

The item-total statistics were checked for each item based on the hypothesised factor before the EFA was conducted. The overall Cronbach's alpha for the Openness to Experience subscale was 0.956. The Cronbach's Alpha if Item Deleted values were checked and it was found that the alpha would rise to 0.963 if item OE3 was deleted and to 0.962 if item OE9 was deleted. In addition, the corrected item-total correlation for these two items were relatively low (OE3 = 0.532; OE9 = 0.542). The overall Cronbach's alpha was 0.824 for the Behavioral Awareness subscale, and the Cronbach's Alpha if Item Deleted values for each item were below the overall alpha, suggesting that none of the items negatively impacted internal consistency. The overall Cronbach's alpha for the Valued Action subscale was 0.922. The Cronbach's Alpha if Item Deleted for item VA1 (0.937) was higher than the overall alpha, however, and the corrected item-total correlation was low (0.414). Items OE3, OE9 and VA1 were identified as candidates for removal based on these findings and were carried forward for further evaluation in the EFA (detailed data available via OSF, Folder 3).

3.4. Exploratory factor analysis

In the research, EFA was carried out to see the scale's factor structure (construct validity), and two tests were performed to determine the suitability of the data. The Kaiser-Meyer-Olkin (KMO)

sample adequacy test shows the adequacy of the number of participants and should be over 0.50 (Field 2009; Byrne 2010; Hair et al. 2014; Awang 2015). The Bartlett Sphericity test indicates whether the data show diversity, and the p-value should be less than 0.05 (Özdamar 2016; Ghazali et al. 2019). In EFA, factors with eigenvalues greater than one were considered in determining the factor structure. It was deemed appropriate for the total variance rate explained in EFA to be over 50% (Fabrigar et al. 1999; Beavers et al. 2013; Comrey and Lee 2013). The direct oblimin method with principal axis factoring was used, because the factors were expected to be correlated, and this is an oblique rotation method. The following criteria were used for item removal: (1) items with factor loadings less than 0.50 were removed; (2) a minimum of three items per factor was retained; (3) items with cross-loadings greater than 0.30 on more than one factor with a minimum difference in factor loadings of less than 0.10 were removed (Norman and Streiner 1994; Tucker and MacCallum 1997; Hooper 2012) and (4) communality values less than 0.50 were considered for removal (Field 2009).

Some assumptions were tested before proceeding to EFA in the study. As a result of the test, it was seen that there were no outliers in the data set, that the data showed a normal distribution, and that the variables were in a linear relationship with each other. It was also seen that there was no multicollinearity problem. The KMO value in the initial EFA was 0.894 and Bartlett's Test of Sphericity was statistically significant ($\chi^2 = 7853.035$, $df = 253$, $p < .001$). The total variance explained table showed the presence of four factors. The pattern matrix showed that the items OE3 and OE9 loaded on the fourth factor instead of the Openness to Experience factor. Further, the factor loading for item VA1 was less than 0.50. These three items were previously identified as having low item-total scores. Thus, OE3, OE9, and VA1 were excluded from the scale and EFA was repeated (see detailed data on OSF, Folder 4.1).

The KMO value was increased to 0.908 and Bartlett's Test of Sphericity was statistically significant ($\chi^2 = 6935.438$, $df = 190$, $p < .001$) in the second EFA. The total variance explained table showed that there were three factors with eigenvalues greater than 1.0, which accounted for 75.848% of the total variance. The first factor (Openness to Experience) accounted for 36.393% of the variance, the second factor (Valued Action) accounted for 25.194% of the variance, and the third factor (Behavioral Awareness) accounted for 14.260% of the variance. The communality values were between 0.537 and 0.959. The factor loadings of the items in the pattern matrix for each factor were between 0.731 and 0.974, with all values above 0.50. The internal consistency of the 20-item scale was then assessed after EFA. The overall Cronbach's alpha was 0.843. The subscale alpha values were 0.978 for Openness to Experience, 0.824 for Behavioral Awareness, and 0.937 for Valued Action. The corrected item-total correlation values ranged from 0.572 to 0.972. All values were within the recommended range (Fornell and Larcker 1981; Bagozzi and Yi 1988; Nunnally and Bernstein 1994; Büyüköztürk 2007) which indicates good internal consistency of the scale (see detailed data on OSF, Folder 4.2). The factor loadings, descriptive statistics, communalities, and reliability coefficients are shown in Table 2.

Table 2.

CompACT Factor Loadings, Descriptive Statistics, and Reliability Coefficients

Item	M	SD	Factor 1 (OE)	Factor 2 (VA)	Factor 3 (BA)	h^2	I-T	α
OE1	5.98	1.820	.918	-.032	.017	.851	.898	
OE2	5.88	1.999	.969	-.032	.001	.947	.963	
OE4	5.61	1.894	.955	-.006	-.018	.914	.940	
OE5	5.66	1.904	.974	-.033	-.017	.959	.972	.978

OE6	5.54	1.888	.944	-.034	-.028	.901	.932	
OE7	5.48	1.894	.935	-.009	-.016	.877	.916	
OE8	5.42	1.984	.929	-.016	-.046	.870	.911	
OE10	6.07	1.631	.802	.118	.085	.638	.736	
BA1	2.16	.889	-.065	.029	.731	.537	.572	
BA2	2.63	1.086	-.029	-.023	.773	.603	.626	
BA3	2.84	1.479	.011	-.148	.808	.704	.703	.824
BA4	2.97	1.225	.103	.061	.746	.557	.587	
BA5	3.08	1.278	-.021	.025	.786	.614	.655	
VA2	2.70	1.542	.009	.753	.006	.564	.687	
VA3	3.19	1.834	-.044	.781	.070	.612	.714	
VA4	3.04	1.576	-.006	.845	-.102	.747	.811	.937
VA5	3.24	1.468	.031	.936	-.010	.872	.887	
VA6	3.29	1.479	.037	.906	.052	.806	.834	
VA7	3.40	1.417	.050	.891	-.044	.796	.828	
VA8	2.86	1.676	-.103	.875	-.016	.802	.844	
Eigenvalue			7.279	5.039	2.852			
Variance Explained (%)			36.393	25.194	14.260			
Total Variance (%)				75.848				

Note. OE = Openness to Experience; BA = Behavioral Awareness; VA = Valued Action; M = Mean; SD = Standard Deviation; h^2 = Communality; I-T = Corrected Item-Total Correlation; α = Subscale Cronbach's Alpha. Factor loadings $\geq .50$ are considered meaningful. The direct oblimin rotation method was used.

3.5. Confirmatory factor analysis

The study performed CFA analysis after EFA to ensure the scale's construct validity. CFA is a statistical method used to verify the estimated relationships. The scale's general goodness of fit indexes are examined in CFA, then the factor loadings (standardised regression coefficients) are evaluated (DeVellis and Thorpe 2022). General fit indexes must comply with the following values. χ^2/sd (Chi-Square Statistic) ≤ 5 , GFI (Goodness of Fit Index) $0.90 \leq GFI \leq 0.95$, AGFI (Adjusted Goodness of Fit Index) $0.85 \leq AGFI \leq 0.90$, CFI (Comparative Fit Index) $0.90 \leq CFI \leq 0.95$, NFI (Normed Fit Index) $0.90 \leq NFI \leq 0.95$, IFI (Incremental Fit Index) $0.90 \leq IFI \leq 0.95$, TLI (Tucker Lewis Index) $0.90 \leq TLI \leq 0.95$, RMSEA (Root Mean Square Error of Approximation) $0.05 \leq RMSEA \leq 0.08$ (Şimşek 2007; Çokluk et al. 2012; Karagöz 2016). Standardised factor loading values must exceed 0.50 (Şimşek 2007).

CFA analysis was performed with three possible model tests. In Model 1, all 20 items were specified to load onto a single latent factor. In Model 2, a two-factor structure was tested: prior to specifying this model, an EFA was conducted with the number of factors constrained to two, which revealed that Openness to Experience items loaded onto the first factor, while Behavioral Awareness and Valued Action items loaded onto the second factor. In Model 3, the three-factor structure derived from the EFA (Openness to Experience, Behavioral Awareness, and Valued Action) was tested. Although post-hoc modifications based solely on empirical criteria were considered methodologically inappropriate (MacCallum et al. 1992), modification indices were inspected to identify localized areas of model misfit. After the modifications suggested for the three-factor model were implemented, the goodness of fit values obtained was higher (Final model) (Table 3). Inspection of the modification indices indicated localized areas of model misfit. Accordingly, residual covariances were specified only between item pairs for which shared variance could be theoretically justified on the basis of content overlap or plausible method effects (OE1–OE10, OE2–OE4, OE6–OE7, VA2–VA3, and VA4–VA8). In the final model, GFI and AGFI values did not show good fit values and were below 0.90. However, values above .80 can

be considered as 'acceptable' goodness of fit values (Marsh et al. 1988; Schermelleh-Engel et al. 2003). All remaining fit indices met or exceeded the recommended thresholds ($\chi^2/df = 2.590$; NFI = .941; CFI = .963; IFI = .963; TLI = .956; RMSEA = .073). The standardised factor loadings for the three factor model ranged from 0.573 to 1.000, which is above the 0.50 criterion. The standardised factor loadings and regression weights are shown in Table 4, and the AMOS path diagram of the final model is shown in Figure 1 (detailed data available on OSF, Folder 5).

Table 3.

Fit Indices for the Three Competing CFA Models of the Turkish CompACT

Model	χ^2/df	GFI	AGFI	NFI	CFI	IFI	TLI	RMSEA
Model 1: One-factor	18.436	.413	.275	.559	.572	.521	.521	.241
Model 2: Two-factor	6.749	.673	.593	.840	.860	.860	.842	.138
Model 3: Three-factor	3.897	.800	.748	.908	.930	.930	.920	.098
Final Model	2.590	.882	.848	.941	.963	.963	.956	.073

Note. GFI = Goodness of Fit Index; AGFI = Adjusted Goodness of Fit Index; NFI = Normed Fit Index; CFI = Comparative Fit Index; IFI = Incremental Fit Index; TLI = Tucker-Lewis Index; RMSEA = Root Mean Square Error of Approximation. Modification indices were applied only to the final model. The three-factor model was accepted as the final model based on superior fit across all indices.

Figure 1.

AMOS path diagram of the Final CFA model

Note. OE = Openness to Experience; BA = Behavioral Awareness; VA = Valued Action. Ovals represent latent factors; rectangles represent observed indicator variables; circles (e1–e20) represent measurement error terms. Values on single-headed arrows indicate standardised factor loadings. Values on double-headed curved arrows between latent factors indicate standardised inter-factor correlations (OE–BA = $-.02$; OE–VA = $-.11$; BA–VA = $-.17$). All standardised factor loadings were statistically significant at $p < .001$. Five modification indices were applied to the model. The model fit indices were as follows: $\chi^2/df = 2.590$, GFI = .882, AGFI = .848, NFI = .941, CFI = .963, IFI = .963, TLI = .956, RMSEA = .073.

Table 4.

Standardised and Unstandardised Regression Weights for the Three-Factor CFA Model

Item	Factor	Std. Estimate	Estimate	S.E.	C.R.	p
OE1	← Openness to Experience	.892	1.000	—	—	—
OE2	← Openness to Experience	.970	1.195	.039	30.503	< .001
OE4	← Openness to Experience	.944	1.101	.039	27.994	< .001
OE5	← Openness to Experience	.991	1.162	.035	32.747	< .001
OE6	← Openness to Experience	.947	1.102	.039	28.312	< .001
OE7	← Openness to Experience	.928	1.083	.041	26.665	< .001
OE8	← Openness to Experience	.924	1.078	.041	26.334	< .001
OE10	← Openness to Experience	.727	.731	.039	18.662	< .001
BA1	← Behavioral Awareness	.640	1.000	—	—	—
BA2	← Behavioral Awareness	.686	1.309	.136	9.643	< .001
BA3	← Behavioral Awareness	.814	2.116	.197	10.758	< .001
BA4	← Behavioral Awareness	.637	1.372	.151	9.109	< .001
BA5	← Behavioral Awareness	.729	1.639	.162	10.084	< .001
VA2	← Valued Action	.573	1.000	—	—	—
VA3	← Valued Action	.597	1.238	.101	12.260	< .001
VA4	← Valued Action	.719	1.281	.127	10.051	< .001
VA5	← Valued Action	1.000	1.660	.137	12.103	< .001
VA6	← Valued Action	.937	1.568	.133	11.748	< .001
VA7	← Valued Action	.926	1.485	.127	11.676	< .001
VA8	← Valued Action	.805	1.525	.141	10.786	< .001

Note. Std. Estimate = Standardised regression coefficient; S.E. = Standard Error; C.R. = Critical Ratio; p = Significance value. All critical ratios were statistically significant at $p < .001$. The reference item for each factor (set to 1.000) was used as the scaling indicator.

3.6. Validity and reliability analyses

Convergent and Divergent Validity

The heterotrait-monotrait (HTMT) ratio of correlations was used to assess convergent and divergent validity at the factor level (Gaskin and Lim 2016). Generally, convergent validity was supported when CR values exceeded 0.70, AVE values exceeded 0.50, and CR values exceeded their corresponding AVE values (Yaşlıoğlu 2017; Hair et al. 2021). Divergent validity was supported when: (1) the square root of each factor's AVE exceeded its correlations with other factors (Chin et al. 1997; Yaşlıoğlu 2017); (2) MSV values were smaller than AVE values (Almén et al. 2018; Nadeem et al. 2020); and (3) HTMT correlations were less than 1.00 (Henseler et al. 2015; Kline 2016).

As shown in Tables 5 and 6, all CR values exceeded 0.80, and CR values exceeded their corresponding AVE values across all subscales. AVE values were above the 0.50 threshold for two of the three subscales. For the Behavioral Awareness (BA) subscale, the AVE value was marginally below the conventional threshold (.496); however, this was deemed acceptable due to the strong CR value (.830), indicating borderline but adequate convergent validity overall. Regarding divergent validity, the square root of each factor's AVE (bold diagonal values in Table 6) exceeded the inter-factor correlations, and all MSV values were smaller than their corresponding AVE values. Furthermore, all HTMT correlations were less than 1.00. Taken together, these results firmly support the divergent validity of the Turkish CompACT.

Internal Consistency and Test-Retest Reliability

Cronbach's alpha (α), McDonald's omega (ω), and CR values were examined as indicators of reliability, with values exceeding 0.70 considered acceptable (Fornell and Larcker 1981; Bagozzi and Yi 1988). As presented in Table 5, all alpha and omega values exceeded 0.70, and all CR values exceeded 0.80, indicating satisfactory internal consistency.

Test-retest reliability was assessed by administering the same survey to a randomly selected subsample of 30 participants from the main sample, 14 days after the initial administration. Pearson correlation coefficients were computed between Time 1 and Time 2 scores. Results indicated strong temporal stability: $r = 0.745$ ($p < .01$) for the Openness to Experience subscale, $r = 0.724$ ($p < .01$) for the Behavioral Awareness subscale, $r = 0.781$ ($p < .01$) for the Valued Action subscale, and $r = 0.747$ ($p < .01$) for the global scale (detailed data available via OSF, Folder 7).

Table 5.

Descriptive Statistics and Reliability Indices of the Turkish CompACT

	Items	Mean	SD	Skewness	Kurtosis	Cronbach's α	McDonald's ω
Global Scale	20	3.847	.718	-.673	1.214	.843	.841
Openness to Experience	8	5.706	1.738	-1.733	1.673	.978	.980
Behavioral Awareness	5	2.733	.925	.648	.176	.824	.837
Valued Action	7	3.102	1.342	.755	-.397	.937	.923

Note. Skewness and kurtosis values were computed following reverse coding of the relevant items. Values between -3 and +3 indicate acceptable normality. Detailed data available via OSF, Folder 6.

Table 6.*Convergent and Divergent Validity Indices of the Turkish CompACT*

Factor	CR	AVE	MSV	MaxR(H)	OE	BA	VA
OE	.977	.844	.011	.990	.919		
BA	.830	.496	.029	.843	-.015	.704	
VA	.927	.655	.029	1.000	-.106**	-.170*	.809

Note. CR = Composite Reliability; AVE = Average Variance Extracted; MSV = Maximum Shared Variance; MaxR(H) = Maximum Reliability; OE = Openness to Experience; BA = Behavioral Awareness; VA = Valued Action. Bold diagonal values represent the square root of the AVE. Convergent validity is generally supported when CR > .70, AVE > .50, and CR exceeds AVE; however, the AVE for BA (.496) falls marginally below the conventional threshold and should therefore be interpreted as indicating borderline convergent validity for that factor. For divergent validity: diagonal values ($\sqrt{\text{AVE}}$) exceed off-diagonal inter-factor correlations, and MSV < AVE. HTMT correlations were all less than 1.00, further supporting divergent validity. * $p < .05$; ** $p < 0.1$. Detailed data available via OSF, Folder 6.

Construct Validity with External Criteria

To further evaluate the criterion-related validity of the Turkish CompACT, Pearson correlation coefficients were computed between CompACT scores and scores on the AAQ-II and DASS-21. It was hypothesised (H3) that higher CompACT scores (reflecting greater psychological flexibility) would be negatively associated with psychological inflexibility (AAQ-II) and psychological distress (DASS-21). Results supported this hypothesis: the global CompACT score was negatively correlated with AAQ-II ($r = -.365$, $p < .01$) and DASS-21 ($r = -.403$, $p < .01$). All three CompACT subscales were also negatively correlated with both criterion measures (Table 7). These findings are consistent with theoretical expectations and support the construct validity of the Turkish CompACT.

It should be noted that CFA was not separately conducted for the AAQ-II and DASS-21 in this study, as these instruments served exclusively as criterion measures for evaluating the validity of the CompACT. A full psychometric evaluation of the Turkish translations of these instruments was beyond the scope of the present study and constitutes a limitation that future research should address.

Measurement invariance across demographic subgroups (e.g., gender, academic year) was not examined in the present study. Whether the Turkish CompACT functions equivalently across these groups remains unknown and should be investigated in future research using multi-group confirmatory factor analysis.

Table 7.*Pearson Correlations Between the Turkish CompACT and Criterion Measures*

Variable	1	2	3	4	5	6	7	8	9
1. Global Scale	1								
2. Openness to Experience	.718**	1							
3. Behavioral Awareness	.331**	-.007	1						
4. Valued Action	.448**	-.138*	-.148**	1					
5. AAQ-II	-.365**	-.201**	-.099	-.258**	1				
6. DASS-21	-.403**	-.123*	-.239**	-.322**	.244**	1			
7. DASS-21 Depression	-.388**	-.107	-.234**	-.322**	.223**	.982**	1		
8. DASS-21 Anxiety	-.433**	-.154**	-.248**	-.325**	.267**	.975**	.934**	1	
9. DASS-21 Stress	-.359**	-.098	-.219**	-.298**	.223**	.978**	.948**	.922**	1

Note. Global Scale = Turkish CompACT total score; AAQ-II = Acceptance and Action Questionnaire-II; DASS-21 = Depression Anxiety Stress Scale-21. ** $p < .01$ (two-tailed); * $p < .05$ (two-tailed). Detailed data available via OSF, Folder 8.

4. Discussion

Psychological flexibility, defined as the capacity to remain in contact with the present moment and redirect behaviour in accordance with personal values regardless of unwanted internal experiences (Hayes et al. 2006), is increasingly recognised as a resource of particular relevance for individuals working in high-stakes, emotionally demanding environments. The present study sought to adapt the CompACT into Turkish and to evaluate its psychometric properties in a sample of emergency aid and disaster management students. The results supported a 20-item three-factor structure comprising Openness to Experience, Behavioral Awareness, and Valued Action, with satisfactory reliability, convergent and discriminant validity, and temporal stability across a 14-day interval.

Although the CompACT was originally developed in an English-speaking, non-clinical adult sample in the United Kingdom, subsequent international adaptations have examined its psychometric performance across diverse cultural and clinical contexts. In the original development study, Francis et al. (2016) identified a three-factor structure through exploratory factor analysis in a sample of 352 participants ($N = 377$ before outlier removal), with the 23-item version explaining 59.6% of the total variance and demonstrating high internal consistency across subscales ($\alpha = .87-.90$) and for the overall scale ($\alpha = .91$). The three-factor model has been broadly confirmed in subsequent cross-cultural work, though the optimal number of items has varied. Trindade et al. (2021) found that a Portuguese adaptation performed better with 18 items after removing five from the Openness to Experience subscale, and partial metric invariance was demonstrated between the Portuguese and UK samples, with discrepancies attributed to cultural and linguistic differences. Tynan et al. (2022) subsequently validated the 18-item version in U.S. active-duty military personnel ($N = 178$), finding that the CompACT-18 reached acceptable fit ($\chi^2/df = 1.73$, RMSEA = 0.069, SRMR = 0.074) whereas the full 23-item version showed poor fit; internal consistency ranged from $\alpha = 0.768$ to 0.861 across subscales. Giovannetti et al. (2024) also compared the 18-item version with the full scale in a large multisite study of MS patients in Italy, Germany, and Spain ($N = 725$), finding that the 18-item version had a better fit (RMSEA = 0.05, CFI = 0.93, SRMR = 0.05) and adequate internal consistency ($\alpha \geq 0.78$) and test-retest reliability (intraclass correlation coefficients ≥ 0.86). The three-factor model was confirmed in Chinese samples by Chen et al. (2023) in a large sample of civil servants ($N = 4,999$; 54.3% variance explained; overall $\alpha = 0.87$) and by Zhao et al. (2024) in a sample of breast cancer survivors ($N = 308$; $\alpha = 0.71$; RMSEA = 0.069). The Persian version (Hajloo et al. 2022) was confirmed by confirmatory factor analysis in an adult sample from Iran ($N = 256$), and the Malay version (Musa et al. 2022) was tested using classical test theory and Rasch measurement approaches. An Indonesian adaptation (Sugando and Abidin 2022) retained 13 items across the three factors with acceptable fit ($N = 440$; RMSEA = 0.068; CFI = 0.95; SRMR = 0.054). A Czech translation has also been made available (Ptáček and Jelínek 2024). Overall, this evidence supports the validity of the tripartite conceptualization of psychological flexibility, although there are some differences in item retention across culture and occupation, especially in the Openness to Experience subscale.

In the study, EFA was first performed to determine the construct validity, and then CFA was performed to verify the construct. As a result of EFA, four factors with eigenvalues above one were identified. OE3 and OE9 items were observed to be grouped under the 4th factor, and the factor loading of the VA1 item was below 0.50. These items were removed, and EFA was performed again, resulting in a 3-factor structure. After the deletion of OE3, OE9 and VA1, 20

items remained in the Turkish adaptation, and the three-factor solution accounted for 75.848% of the total variance. This percentage of variance accounted for is higher than most previous adaptations, and is consistent with the high sampling adequacy found in the present data ($KMO = 0.908$). The overall Cronbach's alpha is 0.843, which is within the range reported in international studies ($\alpha = 0.71\text{--}0.91$). The subscale alphas were 0.978 for Openness to Experience, 0.824 for Behavioral Awareness, and 0.937 for Valued Action.

It is important to reflect on the removal of OE3 and OE9 from the Openness to Experience subscale. Both items refer to the willingness to tolerate or approach unwanted internal states, a central concept in ACT theory known as experiential acceptance. Collectivist values and normative expectations regarding emotional expression in Turkish cultural contexts could have influenced the interpretation of these items. Emotional suppression and stoic coping responses have been well documented as culturally sanctioned coping responses in collectivist societies where openly expressing negative internal states may be viewed as a personal weakness or social inappropriateness (Markus and Kitayama 1991; Triandis 1995). Under these conditions, OE3 ("One of my greatest goals is to be free from painful feelings") and OE9 ("I get so caught up in my thoughts that I cannot do the things I most want to do"), which explicitly reference avoidance of negative emotions and cognitive fusion, may have been perceived as measuring something other than experiential openness in the intended ACT sense, producing unstable factor loadings. This interpretation is consistent with earlier cross-cultural findings: Trindade et al. (2021) noted that OE subscale items were most susceptible to cultural misfit in their Portuguese adaptation, and Sugando and Abidin (2022) retained only two OE items in their Indonesian version. The removal of VA1 may require a different explanation. Valued Action items measure the degree to which daily behaviour is guided by personally meaningful values. In a student population whose vocational values may still be forming through professional education, the discriminatory power of individual items can be attenuated. Furthermore, in collectivist cultural contexts, value-guided action tends to be framed in terms of social and familial obligations rather than autonomous personal agency (Hofstede 2001), which may reduce the salience of items that emphasise individual value adherence. Future research should examine the content equivalence of the removed items across Turkish samples to determine whether translation quality or deeper construct-level differences account for their misfit. The full Turkish item list is provided both in Supplementary Table S1 and in the Open Science Framework (OSF; Folder 9), together with the final 20-item Turkish version of the CompACT. This allows future researchers to apply, inspect, and further evaluate the Turkish translation transparently.

In the second stage of construct validity, CFA analysis was performed to evaluate the 20-item three-factor structure identified through EFA. During this process, modification indices indicated localized areas of model misfit. To improve model fit while preserving interpretability, residual covariances were added to the final model. Importantly, these modifications were not based solely on statistical criteria but were also considered theoretically meaningful. Specifically, correlated residuals were allowed between OE1 and OE10, which appear to reflect respondents' metacognitive relationship to thoughts; OE2 and OE4, as well as OE6 and OE7, which capture closely related aspects of avoidance/control versus acceptance of internal experiences; and VA2–VA3 together with VA4–VA8, which reflect overlapping aspects of values-consistent persistence and committed action. At the same time, it is acknowledged that these correlated residuals may also indicate local item dependence or wording effects, particularly where similar phrasing or reverse-keyed structures are present. Therefore, the modified model should be interpreted with caution and cross-validated in independent samples. Following these theoretically grounded

modifications, the three-factor model consistently produced the highest goodness-of-fit values across all indices. All standardised regression coefficients exceeded 0.500, confirming strong item-factor relationships and the internal coherence of the proposed structure. These results are consistent with confirmatory analyses conducted in Persian, Indonesian, and Chinese samples (Hajloo et al. 2022; Sugando and Abidin 2022; Zhao et al. 2024), and with the general conclusion that the tripartite structure of the CompACT is cross-culturally replicable.

The convergent and discriminant validity of the Turkish CompACT were evaluated using the HTMT ratio, AVE, CR, and MSV indices. All CR values exceeded 0.80, and CR exceeded AVE in all three subscales, indicating good internal reliability. AVE values were above the conventional 0.50 threshold for the Openness to Experience (OE) and Valued Action (VA) subscales. For the Behavioral Awareness (BA) subscale, the AVE was marginally below the threshold (.496); however, given its strong CR value (.830), this was deemed acceptable and indicative of borderline convergent validity (Fornell and Larcker 1981; Hair et al. 2021). Discriminant validity was fully supported: the square root of each subscale's AVE exceeded the inter-factor correlations, MSV was smaller than AVE in all cases, and HTMT ratios remained below 1.00 for all factor pairs. Internal consistency was adequate across all subscales and the global scale. Test-retest reliability, assessed over a 14-day interval in a randomly selected subsample of 30 participants, produced Pearson correlation coefficients greater than 0.70 for the global scale and all three subscales, indicating satisfactory temporal stability.

In accordance with the third hypotheses (H3), the relationship between CompACT scores and scores on the AAQ-II and DASS-21 was examined to assess criterion-related validity. The global CompACT score was negatively correlated with the AAQ-II ($r = -.365, p < .01$) and the DASS-21 ($r = -.403, p < .01$), and this pattern was consistent across all three subscales. These associations are theoretically expected given that the CompACT measures psychological flexibility, the AAQ-II assesses experiential avoidance, and the DASS-21 captures psychological distress, which has been consistently reported to be inversely associated with psychological flexibility (Hayes et al. 2006). The direction and magnitude of these correlations are consistent with those reported in previous CompACT validation studies (Francis et al. 2016; Trindade et al. 2021; Chen et al. 2023), further supporting the construct validity of the Turkish adaptation.

4.1. Contributions of CompACT

The psychometrically valid Turkish version of CompACT has implications for assessment and promotion of psychological flexibility in emergency and disaster management settings. Disaster workers are regularly subjected to traumatic situations, time constraints and life and death decisions. Psychological flexibility can be trained using acceptance and values-based interventions, and an accurate and validated assessment instrument is essential to identify those who might benefit from this training.

The Turkish CompACT can be used as an objective outcome measure in pre-service education and training programmes to assess the effectiveness of the psychological skills components. By administering the scale before and after training, programme developers can determine if psychological flexibility outcomes are improving and adjust the training content if gains are not being made (Hayes et al. 2006).

Systematic evaluation of psychological flexibility can be used to identify responders who require more targeted support in post-disaster psychosocial support programmes. The Turkish CompACT can be used after deployment to stratify participants by risk level, and then allocate

limited psychosocial resources to those who are most likely to benefit from intervention, instead of applying them to everyone. This approach to resource allocation is targeted and equitable, and is consistent with best practice in occupational mental health (World Health Organization 2022).

The psychological flexibility of team leaders at the organisational level has implications for team cohesion, decision making quality and overall disaster response effectiveness. The Turkish CompACT can be used to assess leadership development programmes, to inform selection criteria for leadership positions in high stress environments, and to identify leaders who might benefit from ACT-based coaching.

5.Limitations

The results of the present study should be interpreted with the following limitations in mind. The first is that the participants were recruited by convenience sampling from three state universities, so the findings are not generalisable. The sample is only undergraduate students in emergency aid and disaster management programmes and the psychometric properties of the Turkish CompACT in practising professional disaster workers have not been determined.

Second, the exploratory and confirmatory factor analyses were performed on the same sample of 302 participants, so the results of the structural analysis need to be replicated. The total sample size was too small to allow for the separation of the sample into EFA and CFA subgroups, since each would have included about 150 participants, which is the minimum sample size required for stable factor-analytic estimation with 20 items (MacCallum et al. 1992).

Third, the measurement invariance across relevant subgroups (e.g., gender, age group) was not investigated. Direct comparisons of scores across subgroups should be interpreted with caution if there is no invariance testing. Future studies are recommended to include measurement invariance testing.

Fourth, being a cross-sectional study, no data were gathered on longitudinal change or sensitivity to intervention. The test-retest procedure over 14 days in a small subsample ($n = 30$) only offers a preliminary estimate of reliability over time. Future research should investigate the sensitivity of the Turkish CompACT to change after ACT-based interventions in a longitudinal study.

Fifth, the data were gathered using self-report questionnaires in a single session, thus raising the possibility of common method variance. Methodological controls like anonymous data collection or counterbalanced item ordering could be included in future studies.

Sixth, only two comparison instruments (AAQ-II and DASS-21) were used to assess criterion-related validity. A larger sample of convergent and discriminant validity measures should be used in future validations to support construct validity.

6.Conclusion

The present study offers preliminary evidence that the 20-item Turkish version of the CompACT is a psychometrically sound instrument for measuring psychological flexibility in emergency aid and disaster management students in Türkiye. The three-factor structure of Openness to Experience, Behavioral Awareness, and Valued Action was confirmed by both exploratory and confirmatory factor analyses, and was consistent with the original UK development study and with subsequent validations in Portuguese, Chinese, Persian, Indonesian, and other cultural contexts. The scale had good internal consistency, good test-retest reliability,

and criterion-related validity with expected negative correlations with experiential avoidance (AAQ-II) and psychological distress (DASS-21).

Several directions for future research are indicated. First, the three-factor structure should be replicated in an independent sample using a dedicated confirmatory dataset. Second, the scale's psychometric properties should be examined in samples of actively deployed disaster response professionals. Third, measurement invariance testing across gender, age, and professional subgroups is needed before the Turkish CompACT is used for comparative purposes. Fourth, longitudinal studies are required to determine whether the scale is sensitive to change following ACT-based training or other psychological interventions. Fifth, the cultural misfit of the removed items (OE3, OE9, and VA1) should be examined through cognitive interviewing techniques to determine whether removal reflects translation equivalence issues or construct-level differences in how Turkish respondents interpret core ACT processes.

Disaster workers are required to make time-critical decisions affecting human life under conditions of extreme uncertainty, emotional arousal, and physical exhaustion. Individuals with higher psychological flexibility are better equipped to remain behaviourally effective in such conditions. The Turkish CompACT offers a validated, freely available tool that researchers and organisations can use to measure psychological flexibility in Turkish-speaking emergency and disaster management populations, to evaluate intervention outcomes, and to support evidence-based approaches to occupational mental health in this high-risk professional group.

List of abbreviations:

AAQ II: Acceptance and Action Questionnaire
 AGFI: Adjusted Goodness of Fit Index
 AMOS: Analysis of Moment Structures
 AVE: Average Variance Extracted
 BA: Behavioral awareness
 CFA: Confirmatory Factor Analysis
 CFI: Comparative Fit Index
 CMIN/df: Chi-Square Statistic
 CompACT: Comprehensive Assessment of Acceptance and Commitment Therapy Processes
 CR: Composite Reliability
 DASS-21: Depression Anxiety and Stress Scales
 EFA: Exploratory Factor Analysis
 GFI: Goodness of Fit Index
 h^2 : Communality
 HTMT: Heterotrait-monotrait
 IFI: Incremental Fit Index
 I-T: Corrected item-total correlations
 KMO: Kaiser-Meyer-Olkin
 M: Mean,
 MSV: Maximum Shared Variance
 NFI: Normed Fit Index
 OE: Openness to experience
 PTSD: Post-traumatic Stress Disorder

RMSEA: Root Mean Square Error of Approximation

SD: Standard Deviation

SE: Standard error

SPSS: Statistical Package for the Social Sciences

TL: Türkiye Lirası

TLI: Tucker Lewis Index

VA: Valued action

α : Cronbach alpha

ω : McDonald's omega

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