International Journal for Educational and Vocational Guidance
https://doi.org/10.1007/s10775-026-09824-z

The serial mediating role of contextual variables and cognitive elements on career indecision in Turkish undergraduate students: a multi-group analysis based on gender

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Received: 16 February 2026 / Accepted: 23 June 2026
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Abstract
Career indecision involves difficulties in making career decisions that may harm well-being and future career paths, making it important to identify its contributing factors during the university years. This study examined whether career decision self-efficacy and vocational outcome expectations serially mediate the relationships between perceived social support, career barriers, and career indecision among Turkish undergraduates, and whether the model differs by gender. The sample included 785 undergraduates. Multigroup structural equation modeling was conducted to test the mediation model and gender differences. Career barriers were indirectly related to career indecision through the serial mediation of career decision self-efficacy and vocational outcome expectations. The serial mediation between perceived social support and career indecision through these cognitive variables was not significant in the full sample but was significant for females. No significant gender differences were found in the overall model. The study offers new evidence on career decision-making, and practical implications for interventions to prevent and reduce career indecision among Turkish undergraduates.

Keywords Perceived social support · Career barriers · Career decision self-efficacy · Vocational outcome expectations · Career indecision

The findings of this study were presented as a poster at the 17th Asian Conference on Education (ACE2025) from 23 to 28 November 2025.

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Published online: 13 July 2026

Résumé
L'indécision professionnelle implique des difficultés à prendre des décisions de carrière susceptibles de nuire au bien-être et aux trajectoires professionnelles futures, ce qui rend important l'identification de ses facteurs contributifs durant les années universitaires. Cette étude a examiné si l'auto-efficacité dans la prise de décision de carrière et les attentes de résultats professionnels médiatisent en série les relations entre le soutien social perçu, les obstacles à la carrière et l'indécision professionnelle chez des étudiants turcs de premier cycle, et si le modèle diffère selon le genre. L'échantillon comprenait 785 étudiants de premier cycle. Une modélisation par équations structurelles multi-groupes a été réalisée pour tester le modèle de médiation et les différences de genre. Les obstacles à la carrière étaient liés indirectement à l'indécision professionnelle par la médiation en série de l'auto-efficacité dans la prise de décision de carrière et des attentes de résultats professionnels. La médiation en série entre le soutien social perçu et l'indécision professionnelle via ces variables cognitives n'était pas significative dans l'échantillon global, mais l'était chez les femmes. Aucune différence significative selon le genre n'a été observée dans le modèle global. L'étude apporte de nouvelles preuves sur la prise de décision de carrière et des implications pratiques pour les interventions visant à prévenir et réduire l'indécision professionnelle chez les étudiants turcs de premier cycle.

Zusammenfassung
Berufliche Unentschlossenheit umfasst Schwierigkeiten bei der Entscheidungsfindung hinsichtlich der beruflichen Laufbahn, die das Wohlbefinden und zukünftige Karrierewege beeinträchtigen können. Daher ist es wichtig, die Einflussfaktoren bereits während des Studiums zu identifizieren. In der vorliegenden Studie wurde untersucht, ob die Selbstwirksamkeit bei beruflichen Entscheidungen und die Erwartungen an berufliche Ergebnisse die Zusammenhänge zwischen wahrgenommener sozialer Unterstützung, wahrgenommenen Karrierebarrieren und beruflicher Unentschlossenheit bei türkischen Studierenden seriell mediieren und ob sich das Modell hinsichtlich des Geschlechts unterscheidet. Die Stichprobe umfasste 785 Studierende. Zur Überprüfung des Mediationsmodells und möglicher Geschlechtsunterschiede wurde eine Mehrebenen-Strukturgleichungsmodellierung durchgeführt. Karrierebarrieren standen über die serielle Mediation von Selbstwirksamkeit bei beruflichen Entscheidungen und Erwartungen an berufliche Ergebnisse indirekt mit beruflicher Unentschlossenheit in Zusammenhang. Die serielle Mediation zwischen wahrgenommener sozialer Unterstützung und beruflicher Unentschlossenheit über diese kognitiven Variablen war in der Gesamtstichprobe nicht signifikant, jedoch signifikant für Frauen. Im Gesamtmodell zeigten sich keine signifikanten Geschlechtsunterschiede. Die Studie liefert neue Erkenntnisse zur beruflichen Entscheidungsfindung und praktische Implikationen für Interventionen zur Prävention und Reduktion beruflicher Unentschlossenheit bei türkischen Studierenden.

Resumen
La indecisión vocacional implica dificultades para tomar decisiones de carrera que pueden afectar el bienestar y las trayectorias profesionales futuras, por lo que es im-

portante identificar los factores que contribuyen a ella durante los años universitarios. Este estudio examinó si la autoeficacia en la toma de decisiones de carrera y las expectativas de resultados vocacionales median en serie las relaciones entre el apoyo social percibido, las barreras profesionales y la indecisión vocacional entre estudiantes universitarios turcos, y si el modelo difiere según el género. La muestra incluyó a 785 estudiantes universitarios. Se realizó un modelado de ecuaciones estructurales multigrupo para probar el modelo de mediación y las diferencias de género. Las barreras profesionales se relacionaron indirectamente con la indecisión vocacional a través de la mediación en serie de la autoeficacia en la toma de decisiones de carrera y las expectativas de resultados vocacionales. La mediación en serie entre el apoyo social percibido y la indecisión vocacional a través de estas variables cognitivas no fue significativa en la muestra total, pero sí lo fue para las mujeres. No se encontraron diferencias significativas de género en el modelo general. El estudio aporta nueva evidencia sobre la toma de decisiones de carrera y ofrece implicaciones prácticas para intervenciones orientadas a prevenir y reducir la indecisión vocacional entre estudiantes universitarios turcos.

Introduction

An important aspect of career decision-making is the extent to which individuals feel decided or undecided about their career choice. Career decision refers to an individual's confidence in their career choice, while career indecision refers to specific problems that may prevent an individual from making a career decision (Osipow & Winer, 1996). Career indecision, defined as the difficulty experienced when making career decisions (Gati et al., 1996), is also considered as a developmental problem arising from insufficient knowledge regarding oneself or the professional world (Chartrand et al., 1994). However, one of the developmental periods in which important career decisions are made is one's university years.

The university years coincide with a period of exploration in career development, encompassing the making of a career choice, being committed to that choice, and implementing it by finding or selecting a job (Sharf, 2017). In a sense, the university period constitutes a critical phase during which young adults determine significant aspects of their future careers. Decisions specific to this period affect young adults' perceptions of professional self-efficacy and overall life satisfaction (Jaensch et al., 2015). Career indecision is observed in a significant portion of university students (Büyükgöze Kavas, 2011; Kang, 2009). This indecision is associated with a number of negative outcomes such as depression, lower core self-evaluation, and a lower occupational self-efficacy (Amaral et al., 2023; Jaensch et al., 2015; Walker & Peterson, 2012). Indecisive individuals can resolve this decision-making problem either on their own or with the support of career counselors. Indeed, one of the reasons students seek help from university psychological counseling and guidance centers is to address career-related problems (Erkan et al., 2011; Lucas & Berkel, 2005). This situation indicates that career indecision is a noteworthy issue among university students.

Contextual variables and career indecision

One of the variables associated with career decision-making is social support, which is among the contextual variables of the social cognitive career theory (SCCT). Social support is a multidimensional construct that encompasses emotional support (esteem) that allows an individual to feel valued and accepted, informational support, tangible or service-based instrumental support to cope with problems, as well as social companionship and a sense of belonging, provided through family, relatives, peers, and other social relationships (Cohen & Wills, 1985). In addition, perceived social support corresponds to subjective evaluation of the adequacy of that support (Zimet et al., 1988). Another contextual variable in the SCCT is career barriers. Career barriers are defined as events or conditions, either within the person or in his or her environment, that make career progress difficult (Swanson & Woitke, 1997). Career development is influenced by both objective and perceived environmental factors. However, the impact of a particular objective factor depends on how the individual evaluates and responds to that factor. How positive (for example, social support) and negative (for example, career barriers) environmental influences are experienced and interpreted by the individual is considered important in evaluating the career process. Additionally, contextual variables can have direct and powerful effects on career choice formation and implementation (Lent et al., 1994, 2000).

Family support is closely related to career certainty (Constantine et al., 2005), career choices (Aslan & Koçak, 2025), and adolescent–parent career congruence (Söner & Gültekin, 2024). Similarly, school support (Diemer, 2007), peer support, and personal support (Cengiz, 2022) also influence career development. In this context, supportive parenting practices that encourage autonomy can facilitate career exploration and career choice (Ginevra et al., 2015; Maftei et al., 2023). Higher parental support is associated with lower levels of career indecision (Tönbül & Özdemir, 2025). By contrast, controlling or authoritarian parenting styles may restrict autonomy and increase career indecision. Consistent with this perspective, an authoritarian parenting style (Singhal et al., 2025), parental overprotectiveness and rejection (Tönbül & Özdemir, 2025), and overparenting (Wang, 2023) have been shown to be positively associated with career indecision. On the other hand, there are also positive and meaningful relationships between perceived career barriers and career indecision (Constantine et al., 2005; Jaensch et al., 2015; Patton et al., 2003). Career barriers may encompass contextual conditions—such as financial constraints, discrimination, limited opportunities, social/family influences, or insufficient social support—that can make it difficult for an individual to transform their interests into goals, and their goals into actions (Lent et al., 2000, 2001). The perception of such barriers may disrupt individuals' decision-making processes, leading to delays in decision making. Conversely, it is assumed that positive environmental factors (for example, strong support and a low perception of barriers) facilitate the career choice process (Lent et al., 2000). Accordingly, it is expected in this study that career barriers will be positively related to career indecision, whereas perceived social support will be negatively related to career indecision.

The role of cognitive elements

In SCCT, contextual variables guide an individual's cognitive processes, and these cognitive processes can influence the individual's career development (Lent et al., 1994, 2000). Academic and career development varies with the interaction of personal, behavioral, and environmental factors, with self-efficacy and outcome expectations as two important personal variables. Self-efficacy is defined as people's perceptions of their capacity to take and organize the action steps necessary to achieve specific types of performance, whereas outcome expectations refer to an individual's anticipation of the likelihood that a given outcome will occur (Bandura, 1986). Barriers and supports have weak direct effects on career choice and primarily operate indirectly through cognitive factors, particularly self-efficacy (Lent et al., 2001, 2005; Navarro et al., 2007). Research conducted with similar aims in Turkish university samples reveals that social support functions as a source of self-efficacy (Çarkıt & Lent, 2025) and that self-efficacy is also a mediating variable in decision-making outcomes (Büyükgöze Kavas, 2011; Çarkıt & Lent, 2025).

Although self-efficacy and outcome expectations play a dual role in influencing behavior, Bandura argues that self-efficacy is generally more decisive. However, the strength of the influence of these two variables on behavior appears to depend on the nature of the situation. In cases where performance almost certainly guarantees specific outcomes, self-efficacy may be a partial determinant of outcome expectations. However, in cases where outcomes are weakly linked to performance quality, outcome expectations may have a stronger influence on motivation and behavior than self-efficacy (Bandura, 1986). Similarly, in SCCT, it is proposed that in the formation of career interests, outcome expectations are partly determined by self-efficacy, since individuals are assumed to expect desired outcomes in activities they perceive themselves as capable of performing (Lent et al., 2003; Navarro et al., 2007). Self-efficacy can also indirectly influence the career decision-making process through outcome expectations (Lent et al., 1994). Furthermore, Lam et al. (2025) demonstrated that among individuals perceiving high social support, self-efficacy plays a more decisive role than outcome expectations in career choice. Accordingly, it is expected that self-efficacy and outcome expectations will play a serial mediating role in the relationship between contextual variables and career indecision.

Research reveals the relationship between career obstacles, and support and cognitive elements in different sample groups (Chao et al., 2022; Franco et al., 2019; Ginevra et al., 2015; Lee & Park, 2012). Self-efficacy and outcome expectations significantly influence career choice, playing a critical role in shaping individuals' career decisions (Osei et al., 2023; Wong et al., 2024). Additionally, these contextual variables have indirect effects on career indecision (Creed et al., 2004; Jemini-Gashi et al., 2021; Nota et al., 2007) or career decidedness (Çarkıt & Lent, 2025) by influencing cognitive predispositions or thinking styles. In SCCT, self-efficacy and outcome expectations are conceptualized as general cognitive constructs (Bandura, 1986). In the present study, these constructs are addressed within a career-specific framework to better explain career indecision. Career decision self-efficacy refers to individuals' beliefs in their ability to successfully perform tasks required for career decision making (Taylor & Betz, 1983) whereas vocational outcome expectations

refer to beliefs about the long-term consequences of career decision-making behavior (Betz & Voyten, 1997). Studies consistently show a strong, negative correlation between career decision self-efficacy and career indecision (for example, Betz & Luzzo, 1996; Choi et al., 2012; Şeker, 2025). Similarly, research addressing outcome expectations in a career or academic context reports significant negative correlations between these expectations and career indecision (for example, Betz & Voyten, 1997; Feldt & Woelfel, 2009).

Potential impact of gender on the model

This study also aims to answer the question of whether there is a gender-specific difference in the proposed serial mediation model. Research on gender differences has produced inconsistent results (Büyükgöze Kavas, 2011; Demirci, 2023; Kang, 2009). Studies examining the variables that predict career indecision (Creed et al., 2004; Nota et al., 2007) and career choice (Lindley, 2005) have also revealed differences between female and male samples. On the other hand, according to SCCT, gender has no significant effect on the relationships between variables (Lent et al., 2005; Navarro et al., 2007) and retains its predictive power for explaining interests and choices (Lent et al., 2018). Within the theory, gender is conceptualized as a personal input that may shape individuals' learning experiences and access to background contextual affordances. Through these pathways, gender may be associated with self-efficacy beliefs, outcome expectations, and proximal contextual influences related to career choice behavior (Lent et al., 1994). Previous research indicates that perceived social support, career barriers, career decision-making self-efficacy, and vocational outcome expectations may be experienced and interpreted differently by male and female students (Duru et al., 2020; Gianakos, 2001; Rani, 2016; Raque-Bogdan et al., 2012; Wicht et al., 2022). This can lead to differences in career decision-making processes. In this context, examining gender differences in the proposed model can provide new insights into how contextual and cognitive variables are related to career indecision and contribute to the literature.

Current research

Perceptions of support and barriers in career choice are influenced by different life contexts such as socioeconomic status, educational level, and culture (Lent et al., 2005; Lam et al., 2025). Understanding contextual and social factors is essential in individual differences in career indecision (Priyashantha et al., 2023). Therefore, research conducted on different sample groups is needed. The percentage of higher education graduates in Turkey's population aged 25 years and over is 25.3%, and this rate has been increasing over time (TurkStat, 2024a). On the other hand, the labor force participation rate was 54.2% in 2024, and the unemployment rate among the young population was determined to be 16.3% (TurkStat, 2024b). In Turkey, one in four university graduates cannot find a job, and university students experience unemployment and employment anxiety (Alkın & Öksüz, 2020; Tekin Tayfun & Korkmaz, 2016). In addition, unemployment and underemployment conditions in

Turkey (Büyükgöze Kavas et al., 2021) may restrict available job opportunities. It is thought that a significant proportion of young people may experience uncertainty in their career choices and may struggle in their decision-making processes in connection with this situation. Previous studies in Turkey have examined various factors related to career indecision. To the best of our knowledge, no studies conducted in Turkey have examined career indecision as an outcome variable while simultaneously integrating contextual variables and cognitive elements within a mediation model. In addition, the literature provides inconsistent evidence regarding gender-specific differences in research variables. Similar studies conducted in Turkey have rarely examined such differences directly. Considering the prevalence of career indecision among undergraduates in Turkey (Büyükgöze Kavas, 2011), further research is needed to explore this phenomenon and inform intervention programs (Fig. 1). Based on the theoretical framework and previous research reviewed above, the following hypotheses are proposed:

Hypothesis 1 (H1) *There is a positive relationship between career barriers and career indecision.*

Hypothesis 2 (H2) *There is a negative relationship between perceived social support and career indecision.*

Hypothesis 3 (H3) *Career decision self-efficacy and vocational outcome expectations play a statistically significant serial mediating role in the relationship between university students' career barriers and their career indecision.*

Hypothesis 4 (H4) *Career decision self-efficacy and vocational outcome expectations play a statistically significant serial mediating role in the relationship between university students' perceived social support and their career indecision.*

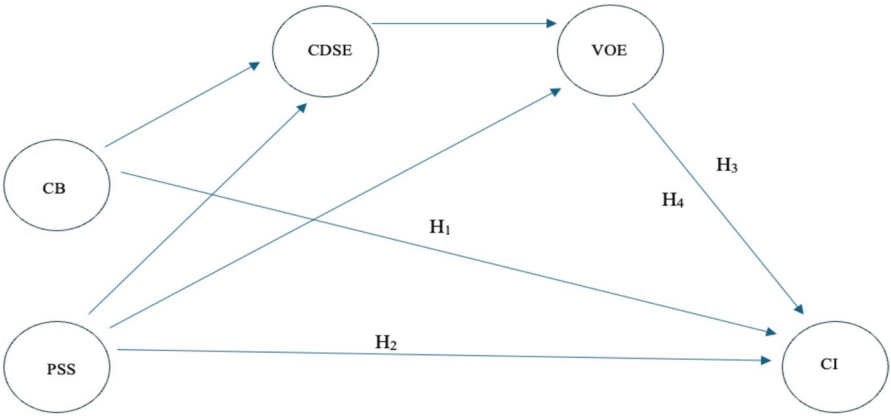


Fig. 1 Research hypothesis. *CB* career barriers, *PSS* perceived social support, *CDSE* career decision self-efficacy, *VOE* vocational outcome expectations, *CI* career indecision. H5: a multigroup analysis (MGA) approach is employed to test whether the hypothesized structural pathways differ by gender

Hypothesis 5 (H5) The mediating role of career decision self-efficacy and vocational outcome expectations in the relationship between university students' perceived social support and career barriers and career indecision differs statistically significantly by gender.

Methods

The study group

University students from different departments of a state university in Turkey were included in the study group for this study. The study employed convenience sampling, with participants drawn from a single institution. Ethical committee approval was obtained from the researchers' affiliated institution prior to the data collection phase of the study (no. 849341 on 28 February 2025). The participants were informed verbally and in writing before participating in the study, and their voluntary and anonymous participation was taken into account. Data were collected during regular class sessions in the 2025 spring semester using paper and pencil questionnaires.

Completion of the questionnaires took approximately 15 min. The preliminary dataset comprised 861 observations. Missing data analyses were examined using Little's missing completely at random (MCAR) test, which indicated that the data were missing completely at random ($p > 0.05$). Cases with extensive consecutive missingness ($n = 28$) were removed. Remaining missing values were handled with multiple imputation by chained equations (MICE) using predictive mean matching (PMM). Multivariate outliers were identified using Mahalanobis distance, and cases exceeding the ±3 standard deviation (SD) threshold ($n = 48$) were excluded. A total of 785 observations were included in the final dataset, comprising females ($n = 568$) and males ($n = 217$). The average age of participants was 21.2 years (SD 2.54). Participants were distributed across grade levels, with 199 first-year ($n = 199$), second-year ($n = 230$), third-year ($n = 192$), and fourth-year students ($n = 164$).

The data collection tools

The career decidedness scale: this scale was developed by Lounsbury et al. (1999) and was adapted into Turkish by Akçakanat and Uzunbacak (2019). The scale consists of a 5-item Likert-type structure (1: strongly disagree, 5: strongly agree) and is a unidimensional measure comprising a total of 6 items. Of the 6 items on the scale, 3 items are reverse-coded, and higher scores on the scale indicate higher levels of career indecision. The unidimensional factor structure, identified through exploratory factor analysis, was subsequently evaluated using confirmatory factor analysis, which demonstrated a satisfactory-to-good model fit (χ^2/degrees of freedom (df), 22.25; comparative fit index (CFI), 0.97; normed fit index (NFI), 0.97; nonnormed fit index (NNFI), 0.95, goodness of fit index (GFI), 0.97; adjusted goodness of fit index (AGFI), 0.93; standardized root mean square residual (SRMR), 0.042; root

mean square error of approximation (RMSEA), 0.068). In the adaptation study, the internal consistency coefficient was calculated as 0.80, and the test-retest reliability was calculated as 0.73.

The career decision self-efficacy scale short form: the Turkish adaptation of this scale, developed by Betz et al. (1996), was conducted by Büyükgöze Kavas (2014). It is a 5-point Likert-type scale and measures individuals' beliefs that they will successfully complete tasks related to career decisions. The scale consists of 18 items, and the lowest possible score is 18, while the highest possible score is 90, a higher score on the scale indicates that the individual has high self-efficacy in making career decisions. Career decision self-efficacy refers to individuals' confidence in their ability to successfully perform tasks involved in career decision making, including self-appraisal, gathering occupational information, goal selection, planning for the future, and problem solving. Construct validity was examined using confirmatory factor analysis by testing theoretically and empirically derived models. While the original 5-factor structure showed inadequate fit, comparisons with alternative models indicated that Gaudron's 4-factor (Gaudron, 2011), 18-item model provided the best fit to the Turkish sample (χ^2/df, 2.6; RMSEA, 0.048; CFI, 0.94; GFI, 0.95). In the adaptation study, the scale's internal consistency coefficient was found to be 0.92, and its test-retest reliability was 0.91.

The vocational outcome expectancy scale: the scale was developed by McWhirter et al. (2000) to measure individuals' outcome expectations regarding an occupation. Adapted into Turkish by Işık (2010), the scale is used as a single dimension. Consisting of 12 items, the OES is rated on a 4-point Likert scale. Scores on the scale range from 12 to 48, with a higher score indicating higher vocational outcome expectations. The unidimensional structure identified through exploratory factor analysis was tested on a cross-validation sample using confirmatory factor analysis, and the model demonstrated an acceptable fit (χ^2/df, 1.46; GFI, 0.92; CFI, 0.96; RMSEA, 0.054; SRMR, 0.053). According to the data obtained in the construct validity study of the scale, valid fit index values were achieved in a confirmatory factor analysis. As a result of the reliability studies conducted, the Cronbach's alpha internal consistency coefficient was calculated as 0.87, and the test-retest reliability coefficient as 0.79 (Işık, 2010).

The multidimensional perceived social support scale: the multidimensional perceived social support scale (MPSS) was developed by Zimmet et al. (1988), being adapted into Turkish by Eker and Arkar (1995), with its revised form being validated and assessed for reliability by Eker et al. (2001). To examine construct validity, exploratory factor analysis was conducted, yielding three distinct factor structures. The MSSS consistsof 12 items. Perceived social support is defined as individuals' perceptions of emotional and instrumental support received from three sources: family, friends, and a significant other, referring to an important person outside the family and friendship network (for example, a romantic partner, fiancé(e), relative, neighbor, or healthcare professional). Each item is evaluated using a 7-point Likert-type scale. A high score indicates a high level of perceived social support. The Cronbach's alpha values for the scale have been reported to be between 0.80 and 0.85 (Eker et al., 2001).

The career barriers inventory: this was developed by Ulaş and Kızıldağ (2018) to measure university students' perceived internal and external career barriers. It consists of four subscales and 18 items: attitudinal barriers (for example, "I do not have the necessary skill in planning my career"), interactional barriers (for example, "I worry that my ethnic background will create an obstacle to my career plans"), social factors (for example, "I have to plan my career according to my family's preferences"), and educational factors (for example, "I think that the education I have received so far has not prepared me for working life"). A high score on the scale indicates that university students perceive high levels of barriers. The 4-factor structure identified through exploratory factor analysis was subsequently tested on an independent sample using confirmatory factor analysis, and the results indicated an acceptable level of model fit (χ^2/df, 3.14; CFI, 0.86; incremental fit index (IFI), 0.86; NFI, 0.81; RMSEA, 0.06). The scale's internal consistency coefficients were found to be 0.79–0.75, 0.71–0.63, 0.71–0.68, and 0.52–0.50, respectively. The corrected correlation coefficients assessing test-retest reliability were 0.93, 0.81, 0.89, and 0.65 across the first to fourth dimensions.

Data analysis

The R 4.5.1 program was used to conduct preliminary analyses. A multigroup structural equation modeling analysis was conducted to examine whether the mediating role of career decision self-efficacy and vocational outcome expectations in the relationship between university students' perceptions of social support and career barriers, and career indecision differed by gender. Based on the number of participants and the results of the multigroup normality analyses, the maximum likelihood–robust (MLR) was used for model estimation when multigroup normality could not be ensured (Lai, 2018).

Prior to conducting group comparisons, measurement invariance across groups was examined by sequentially testing configural, metric, and scalar models, with invariance evaluated using changes in χ^2, CFI (ΔCFI > -0.010), Tucker–Lewis index (TLI) (ΔTLI < 0.050), RMSEA (ΔRMSEA > 0.015), and SRMR (ΔSRMR < 0.030), in line with established recommendations (Chen, 2007; Putnick & Bornstein, 2016). Subsequently, the structural model was specified and tested for the total group with the Mplus 8.3 program. RMSEA, SRMR, CFI, and TLI were reported in this study to evaluate the overall model fit. A CFI value of 0.90 or above (Hu & Bentler, 1999), an RMSEA value of 0.08 or below (Hooper et al., 2008), a TLI value of 0.90 or above (Schumacker & Lomax, 1996), and an SRMR value of 0.08 or below indicate that the model is acceptable (Hu & Bentler, 1999). Following this, an unrestricted multigroup analysis was conducted within the scope of the research. Finally, we estimated a constrained model in which all structural paths were held equal across genders. The chi-square differences ($\Delta\chi^2$) between the unrestricted and restricted models were examined.

Table 1 The means, standard deviations, and correlation coefficients of the variables used in the model

Variables	*M*	SD	1	2	3	4	5
1. Career indecision	15.9	4.34	1				
2. Career decision self-efficacy	63	9.63	−0.532***	1			
3. Vocational outcome expectations	37.4	5.37	−0.490***	0.621***	1		
4. Career barriers	32.5	9.97	0.474***	−0.464***	−0.460***	1	
5. Perceived social support	64.7	14.7	−0.176***	0.321***	0.276***	−0.377***	1

*** indicates $p < 0.001$

Table 2 Results of the measurement invariance test

Model	χ^2	df	CFI	TLI	RMSEA	SRMR	ΔCFI	ΔTLI	ΔRMSEA	ΔSRMR
1. Configural	502.854	188	0.93	0.91	0.06	0.05				
2. Metric	512.491	199	0.93	0.92	0.06	0.05	0.001	0.005	−0.002	0.005
3. Scalar	535.424	210	0.93	0.92	0.06	0.05	−0.003	0.002	0.00	0.002

Findings

The preliminary analyses

Table 1 presents the means, standard deviations, and correlation coefficients of the variables used in the model. The relationships between the variables ranged from −0.53 to 0.62, and all were statistically significant ($p < 0.05$).

Measurement invariance tests

Prior to comparisons between groups, measurement invariance was tested to assess the comparability of structures across groups. As shown in Table 2, the findings supported configurational, metric, and scalar invariance, and all model fit indices fulfilled the suggested criteria. These findings indicated that factor loadings were comparable across groups, justifying subsequent multigroup analyses (Chen, 2007).

The measurement model

The measurement model was evaluated prior to testing the structural relationships using structural equation modeling. Latent constructs were specified as being indicated by their respective subdimensions. The observed variables defining each latent construct were specified in accordance with the factors determined by the original scale developers. Prior to testing the structural model, confirmatory factor analysis (CFA) was conducted for occupational outcome expectations (χ^2/df, 1.46; GFI, 0.92; CFI, 0.96;

RMSEA, 0.054; SRMR, 0.053) and career indecision (χ^2/df, 22.25; CFI, 0.97; GFI, 0.97; SRMR, 0.042; RMSEA, 0.068) demonstrated acceptable fit indices, confirming that both structures are unidimensional at the item level. These structures, confirmed to be unidimensional, were subjected to parceling to reduce model complexity and increase parameter stability (Bandalos, 2002). Accordingly, using a random assignment method (Landis et al., 2000), career outcome expectations were divided into three parcels, and career indecision into two parcels. The factor loadings of the parcels were examined and found to represent a homogeneous distribution of the main structure.

The fit indices of the measurement model are found to be an acceptable fit to data (χ^2, 409.761; df, 94; CFI, 0.93; TLI, 0.91; RMSEA, 0.06; SRMR, 0.04). For all tested models, the chi-square statistic (χ^2) and degrees of freedom (df) were reported with comparative fit indices. The standardized factor loadings, average variance extracted (AVE), and composite reliability (CR) values are presented in Table 4; for the sake of traceability and transparency, this table is included in the Appendix.

The structural model

When examining the fit values of the structural model established for the full sample, the model–data fit was found to be acceptable (χ^2, 409.761; df, 94; CFI, 0.93; TLI, 0.91; RMSEA, 0.06; SRMR, 0.04). The results of the analysis (Fig. 2) revealed that career barriers significantly predict career decision self-efficacy negatively ($\beta = -0.563$, $p < 0.001$), vocational outcome expectations negatively ($\beta = -0.199$, $p < 0.001$), and career indecision positively ($\beta = 0.412$, $p < 0.001$). Perceived social support significantly predicts career decision self-efficacy positively ($\beta = 0.130$, $p < 0.05$) and career indecision positively ($\beta = 0.217$, $p < 0.001$), while it is not a significant predictor of vocational outcome expectations ($\beta = -0.020$, $p > 0.05$). When examining the other paths in the model, career decision self-efficacy is found to be a positive predictor ($\beta = 0.628$, $p <. 001$) of vocational outcome expectations and a negative predictor ($\beta = -0.488$, $p < 0.001$) of career indecision. However, vocational outcome expectations are not a significant predictor of career indecision

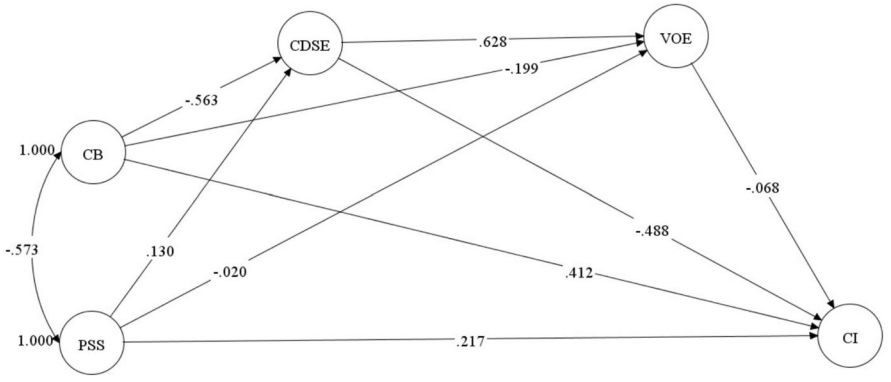


Fig. 2 Serial mediation model results. *CB* career barriers, *PSS* perceived social support, *CDSE* career decision self-efficacy, *VOE* vocational outcome expectations, *CI* career indecision

($\beta = -0.068$, $p > 0.05$). When examining the indirect effects in the model, it can be seen that the serial mediating effect of career barriers on career indecision through career decision self-efficacy and vocational outcome expectations is significant ($\beta = 0.312$, $p < 0.001$). By contrast, the serial mediating effect of perceived social support on career indecision through career decision self-efficacy and vocational outcome expectations is not significant ($\beta = -0.068$, $p > 0.05$).

The multiple group structural equation modeling

The structural model established in the multiple group structural equation modeling was compared between groups of female and male university students. Therefore, when the Satorra–Bentler Adjusted chi-square (Satorra & Bentler, 2010) difference is examined between the unrestricted model in which all paths are freely estimated (χ^2, 535.424; df, 210; CFI, 0.93; TLI, 0.92; RMSEA, 0.06; SRMR, 0.05) and the restricted models in which the paths between the latent variables are equally estimated (χ^2, 553.948; df, 220; CFI, 0.93; TLI, 0.92; RMSEA, 0.06; SRMR, 0.07), it can be seen that the two models do not differ significantly (χ^2, 17.96; df, 10; $p > 0.05$). Accordingly, the path coefficients for the full sample, and the female and male subgroups are given in Table 3.

When examining the pathways in the model, it can be seen that, among women, career barriers significantly predict the career decision self-efficacy ($\beta = -0.517$, $p < 0.001$), vocational outcome expectations ($\beta = -0.106$, $p < 0.05$), and career indecision ($\beta = 0.420$, $p < 0.001$). In the male university students, the career barriers were found to significantly predict the career decision self-efficacy ($\beta = -0.591$, $p < 0.001$), vocational outcome expectations ($\beta = -0.252$, $p < 0.01$), and career indecision ($\beta = 0.602$, $p < 0.001$).

Among women, perceived social support positively predicts career decision self-efficacy ($\beta = 0.142$, $p < 0.05$) and career indecision ($\beta = 0.158$, $p < 0.05$) at a significant level, while it is not a significant predictor of vocational outcome expectations ($\beta = -0.013$, $p > 0.05$). When examining the path coefficients for men, perceived social support was found to be a nonsignificant predictor of career decision self-efficacy ($\beta = 0.054$, $p > 0.05$) and vocational outcome expectations ($\beta = -0.020$, $p > 0.05$). However, it can be said that it statistically significantly predicts career indecision in a positive direction ($\beta = 0.197$, $p < 0.05$).

When examining the other paths in the model, career decision self-efficacy emerges as a significant positive predictor of vocational outcome expectations ($\beta = 0.415$, $p < 0.001$) and a significant negative predictor of career indecision ($\beta = -0.558$, $p < 0.001$) among women. However, vocational outcome expectations do not significantly predict career indecision ($\beta = -0.038$, $p > 0.05$). In males, career decision self-efficacy positively predicts vocational outcome expectations ($\beta = 0.467$, $p < 0.001$) and negatively predicted career indecision ($\beta = -0.522$, $p < 0.01$), whereas vocational outcome expectations are not a significant predictor of career indecision ($\beta = -0.184$, $p > 0.05$).

When examining the indirect paths in the model, it is observed that the serial mediating role of career barriers with career indecision through career decision self-efficacy

Table 3 The path coefficients for the full sample, and the female and male subgroups

Model paths	Full sample			Subgroup of female			Subgroup of male		
	Est.	SE	*p*	Est.	SE	*p*	Est.	SE	*p*
CB									
CDSE	−0.563	0.054	0.000***	−0.517	0.071	0.000***	−0.591	0.108	0.000***
VOE	−0.199	0.055	0.000***	−0.106	0.042	0.012*	−0.252	0.083	0.002**
CI	0.412	0.064	0.000***	0.420	0.082	0.000***	0.602	0.181	0.001***
PSS									
CDSE	0.130	0.064	0.041*	0.142	0.058	0.014*	0.054	0.064	0.399
VOE	−0.020	0.054	0.715	−0.013	0.032	0.689	−0.020	0.042	0.636
CI	0.217	0.062	0.000***	0.158	0.064	0.014*	0.197	0.090	0.029*
CDSE									
VOE	0.628	0.044	0.000***	0.415	0.038	0.000***	0.467	0.068	0.000***
CI	−0.488	0.071	0.000***	−0.558	0.091	0.000***	−0.522	0.172	0.002**
VOE									
CI	−0.068	0.062	0.275	−0.038	0.114	0.741	−0.184	0.231	0.425
Total indirect									
CB									
CI	0.312	0.056	0.000***	0.300	0.049	0.000***	0.406	0.089	0.000***
PSS									
CI	−0.068	0.036	0.063	−0.081	0.037	0.027*	−0.029	0.042	0.488

Standardized estimates for all model path coefficients are reported in the full sample columns, whereas unstandardized estimates are provided in the female and male subgroup columns

CB career barriers, *PSS* perceived social support, *CDSE* career decision self-efficacy, *VOE* vocational outcome expectations, *CI* career indecision

* indicates $p < 0.05$, ** indicates $p < 0.01$, *** indicates $p < 0.001$

and vocational outcome expectations are significant ($\beta = 0.300$, $p < 0.001$) for women. Furthermore, the serial mediating role of perceived social support with career indecision through career decision self-efficacy and vocational outcome expectations ($\beta = -0.081$, $p < 0.05$) is also statistically significant. Similarly, the serial mediating role of career barriers with career indecision through career decision self-efficacy and vocational outcome expectations among male university students is found to be significant ($\beta = 0.406$, $p < 0.001$). By contrast, the serial mediating role of perceived social support with career indecision through career decision self-efficacy and vocational outcome expectations ($\beta = -0.029$, $p > 0.05$) is not found to be significant.

Discussion

This study examines the role of perceived social support, career barriers, career decision self-efficacy, and vocational outcome expectations in university students' levels of career indecision. The proposed model can be seen to reflect certain relationships related to career indecision among Turkish university students, in

line with theoretical expectations and the literature. In this context, research findings indicate significant positive associations between career barriers and career indecision; therefore, H1 is supported. In addition, career barriers were found to be related to career decision self-efficacy and vocational outcome expectations, and these variables, when considered together, were shown to exhibit indirect associations with career indecision; therefore, H3 is supported. In other words, higher perceived career barriers were accompanied by lower levels of career decision self-efficacy and vocational outcome expectations, along with higher levels of career indecision among university students. The findings further indicate that career decision self-efficacy plays a more prominent role in the association between career barriers and career indecision, whereas vocational outcome expectations point to a more limited function within the model, without showing a direct association with career indecision. It can be stated that this finding is supported by the theoretical explanations (Lent et al., 1994, 2000). Career barriers affect students' career choice processes through their self-efficacy (Lent et al., 2001, 2005). In addition, self-efficacy is related to outcome expectations (Navarro et al., 2007; Restubog et al., 2010), and these two variables together have been found to shape the career process (Osei et al., 2023; Wong et al., 2024).

The findings indicate no significant serial mediating relationship between perceived social support on career indecision through career decision self-efficacy and vocational outcome expectations; therefore, H4 was not supported. This result is somewhat inconsistent with the explanations of SCCT regarding career development (Lent et al., 1994, 2000). When the paths in the model were examined, it was found that perceived social support positively predicted career indecision among university students. This result does not align with research findings in the literature regarding the positive relationship between perceived social support and career certainty (Constantine et al., 2005) and the negative relationship with career indecision (Cengiz, 2022). By contrast, the research finding that perceived social support is a significant positive predictor of career decision self-efficacy is consistent with previous literature (Çarkıt & Lent, 2025; Ginevra et al., 2015; Lee & Park, 2012). In the model, the unexpected differences may be explained by cultural, social, and economic factors influencing career development. This suggests that the effect of social support may differ depending on the subject, context, and type of behavior (Lam et al., 2025). In Turkey, a collectivistic culture, perceived social support can function as an effective coping method in various problem areas. On the other hand, there is a significant young population of university graduates in Turkey (TurkStat, 2024a). A significant portion of this group experiences postgraduation employment problems and has concerns specific to this area (Alkın & Öksüz, 2020; Tekin Tayfun & Korkmaz, 2016). This situation may limit the ameliorative role of social support on career indecision in the Turkish university sample. Furthermore, family expectations and societal pressures regarding postuniversity employment may alter the meaning of existing social support for the individual. For example, the item "My family (for example, mother, father, spouse, children, siblings) is willing to help me make decisions" from the multidimensional perceived social support scale may be interpreted as an indicator of social support that fosters autonomous decision-making

in individualistic cultures. However, in collectivistic cultures such as Turkey, it may be perceived in relation to family expectations, a sense of obligation, or the necessity of maintaining family approval. Cohen and Wills (1985) noted that resources provided by others can have both negative and positive effects. Accordingly, particularly when the person seeking or receiving support feels a sense of obligation toward the provider, social support may carry psychological costs and create additional pressure. Indeed, parental intervention is negatively related to coping with career indecision and positively related to career anxiety, while overparenting and parents' maximizing tendencies also positively predict career indecision (Arslan et al., 2023; Bilgiz Öztürk & Peker, 2025; Wang, 2023). While the research findings offer context-specific insights into the role of perceived social support and cognitive factors in career indecision, further research is needed to test the theoretical explanations and to contribute to the literature.

The findings regarding the predictive roles of the variables with career indecision are largely consistent with theoretical explanations and previous research. When examining the pathways in the model, career decision self-efficacy significantly predicts both vocational outcome expectations and career indecision. However, vocational outcome expectations do not significantly predict career indecision in either the overall sample or the subsample groups. This finding partially aligns with research findings showing that outcome expectations do not predict decidedness (Lent et al., 2017) and career interests (Lent et al., 2003) in a number of model tests. However, this result is not consistent with studies reporting significant negative associations between vocational outcome expectations and career indecision (for example, Betz & Voyten, 1997; Feldt & Woelfel, 2009). It also contrasts research emphasizing the predictive role of outcome expectations in career-related outcomes such as interests, career choice, and exploration goals (Çarkıt & Lent, 2025; Lam et al., 2025; Lent et al., 2001). This result may be attributed to the relatively strong association between career decision self-efficacy and vocational outcome expectations in the sample (Table 1), which may have limited the specific contribution of outcome expectations to career indecision. In addition, opportunities for university students in Turkey to gain direct experience transitioning into working life may be relatively limited. Accordingly, their expectations regarding long-term career-related outcomes may remain relatively abstract, and perceptions of "capability" may play a more salient role in the decision-making process. Theoretical explanations emphasizes that outcome expectations are mostly indirectly related to behavior and assume a secondary role compared with self-efficacy (Bandura, 1986; Lent et al., 1994). Within this framework, self-efficacy is considered to be more directly associated with career-related decision behavior, whereas outcome expectations are mostly associated with motivational processes and the maintenance of decisions. In addition, there are studies indicating that outcome expectations are partially determined by self-efficacy (Lent et al., 2003; Navarro et al., 2007; Restubog et al., 2010). In light of this, the contribution of vocational outcome expectations to the serial mediation of career indecision could be considered limited in certain contexts.

Correlation analyses indicated a small but significant negative association between perceived social support and career indecision. However, in the serial mediation model, perceived social support positively predicted career indecision; therefore, hypothesis 2 was not supported. This finding may result from the separation of perceived social support's specific association with career indecision when the cognitive variables in the model are controlled. This pattern may indicate a possible suppression effect. In the overall sample, the serial mediation relationship of perceived social support with career indecision was nonsignificant, whereas in the female subsample, this relationship was significant. Moreover, although perceived social support was a significant predictor of career indecision in the path analyses for both subgroups, the relatively small standardized beta coefficients suggest that this relationship may have limited practical impact. Therefore, the relationship between perceived social support and career indecision appears to occur partly indirectly through cognitive variables, such as career decision self-efficacy and vocational outcome expectations; when these variables are controlled, the direction of the direct relationship may change.

The findings indicate that the model does not appear to differ according to gender; therefore, hypothesis 5 was not supported. This finding is consistent with studies showing that gender has no significant role on the relationships between the variables in the model established according to the SCCT (Lent et al., 2005; Navarro et al., 2007) and findings suggesting that gender retains its predictive power in explaining interests and choices (Lent et al., 2018). The structural similarity of the model across genders suggests that Turkish university students experiencing career indecision exhibit a common pattern in terms of contextual variables and cognitive factors, and that gender does not create a significant difference in this pattern. However, some path coefficients were observed to differ between subgroups. For example, perceived social support significantly predicted career decision self-efficacy in the female subgroup. while it did not have a significant effect on cognitive variables in the male subgroup. Similarly, the serial mediating effect of perceived social support on career indecision was found to be significant only in the female subsample. However, it should be noted that the effect sizes of these findings are limited and do not alter the overall model structure. Furthermore, the fact that some path relationships did not follow in the expected direction (for example, the positive direct relationship between perceived social support and career indecision, and the failure of vocational outcome expectations to significantly predict career indecision) necessitates a cautious and context-specific assessment of these subgroup differences.

In conclusion, the study suggests that career indecision among university students is associated with contextual and cognitive variables. The findings showed that career barriers were positively associated with career indecision and that this relationship was indirectly explained through cognitive variables. Career decision self-efficacy significantly predicted both vocational outcome expectations and career indecision. The serial mediation relationship between perceived social support and career indecision was not found to be significant; however, perceived social support

was determined to be an important predictor of career decision self-efficacy. While the overall structure of the model was invariant across gender, differences were observed in some path coefficients.

Theoretical and practical implications

Drawing upon the career choice model SCCT (Lent et al., 1994, 2000), this study contributes theoretically to the literature by examining the relationship between contextual and cognitive variables, and career indecision among university students. The research findings—specifically by demonstrating that career barriers are associated with career indecision through the mediating roles of career decision self-efficacy and vocational outcome expectations—support the theory's explanations regarding the relationships between contextual and cognitive processes and career behavior. Furthermore, the finding that career decision self-efficacy exhibits a stronger relationship with career indecision within the model compared with vocational outcome expectations suggests that self-efficacy may serve as a more salient cognitive variable in explaining career indecision. Conversely, the fact that the findings regarding perceived social support do not fully align with theoretical expectations suggests that the impact of social support on career development should be addressed in a context-sensitive manner. Particularly in contexts characterized by high levels of economic uncertainty, employment anxiety, and family expectations, social support may be experienced not only as a resource that facilitates career development but also as a construct associated with pressure or uncertainty during the decision-making process. From this perspective, the findings underscore the importance of evaluating the impact of contextual supports within the framework of sociocultural conditions. Additionally, the finding that the general structure of the model demonstrates invariance across genders indicates that the relationships among the variables exhibit a similar pattern for both female and male students. Nevertheless, differences observed in certain path coefficients suggest that, even though career development processes are experienced by female and male students within the same structural framework, the influence of certain relationships may vary depending on gender.

Research findings highlight the importance of intervention that supports the career development of university students. In higher education institutions in Turkey, career counseling services are provided through psychological counseling and guidance centers, and career centers. These findings are thought to contribute to the design and content of these services. Intervention programs could aim to help students recognize perceived barriers, develop cognitive and behavioral strategies to cope with these barriers, strengthen their self-efficacy beliefs, and restructure their vocational outcome expectations. Within this framework, implementing SCCT-based group interventions may be beneficial. Additionally, considering the influence of family relationships on the career decision-making process in Turkey, it is important to include psychoeducational and counseling-based interventions addressing family expectations and social pressures in these programs. In particular, addressing

interpersonal conflicts within student–family relationships may help students cope with perceived career barrier. The research findings may also offer useful practical implications for different stakeholders. University faculty members may play an indirect role in students' career decision-making processes by providing learning experiences that support students' self-efficacy beliefs and vocational outcome expectations. In particular, incorporating career-related skills into course content, providing constructive feedback on students' strengths, and sharing realistic information about different career pathways may help students perceive their career barriers as more manageable. The structural model showed no differences between female and male groups. Therefore, intervention programs can be designed to include both genders. However, the serial mediation effect of perceived social support was found to be significant in the female group. This finding suggests that the role of social support in career indecision may be more important in this group. Therefore, intervention programs may benefit from addressing the relationship between perceived social support and career indecision among female students in greater detail.

Limitations and future directions

This cross-sectional study does not allow for examining the long-term effects of contextual and cognitive factors on university students' career indecision. All data were collected using self-report measures, and observed relationships may appear stronger than they actually are owing to common method variance and social desirability bias. In addition, the use of convenience sampling and data from a single university limits the generalizability of the findings to other institutional, cultural, and socioeconomic contexts. Some theoretical relationships did not emerge as expected, suggesting that alternative structural models or analytical approaches should be considered in future research. Future studies could benefit from longitudinal or experimental designs and multiple data sources to examine causality and temporal changes. Thus, it may be possible to examine the relationships between variables in greater depth within cultural and contextual frameworks. Additionally, it may examine the relationships between vocational outcome expectations and motivational factors related to career choice in greater detail by using measurement tools such as the motivations for career choice scale (Watt et al., 2025). Despite these limitations, this study highlights the potential roles of contextual and cognitive variables in the career indecision of university students within a Turkish sample. Considering the limited number of studies examining career choice processes within the SCCT framework in Turkey, these findings are thought to contribute both to theoretical explanations and to the existing literature. However, further research with similar aims is needed.

Appendix

See Table 4.

Table 4 Standardized factor loadings of the variables

Latent variable	AVE	CR	Observed variable	Factor loadings
Career barriers	0.39	0.72	Attitudinal barriers	0.85
			Interactional barriers	0.50
			Social barriers	0.58
			Educational barriers	0.62
Career decision self-efficacy	0.52	0.81	Goal selection	0.87
			Problem-solving	0.55
			Information gathering	0.67
			Goal pursuit management	0.78
Perceived social support	0.31	0.58	Family	0.60
			Friends	0.55
			A special person	0.50
Vocational outcome expectations	0.71	0.88	PE parcel 1	0.84
			PE parcel 2	0.84
			PE parcel 3	0.83
Career indecision	0.65	0.79	CI Parcel 1	0.76
			CI parcel 2	0.86

Author contributions NU: conceptualization; methodology; supervision; writing—original draft preparation. ŞNY: conceptualization; methodology; analysis; visualization; writing—review and editing writing.

Funding This work has been supported by Anadolu University Scientific Research Projects Coordination Unit under grant number SBA-2025-2780.

Data availability The data that support the findings of this study are available from the corresponding author upon reasonable request.

Declarations

Conflict of interest The authors declare no conflict of interest.

Ethical approval This study was approved by the Social and Human Sciences Research and Publication Ethics Committee of the Anadolu University/Turkey (no. 849341 on 28 February 2025). The procedures used in this study adhere to the tenets of the Declaration of Helsinki.

Informed consent Informed consent was obtained from participants. An informed consent form describing the purpose, procedures, voluntary nature of participation, and confidentiality principles of the study was provided, and all participants read and signed the form prior to participation. The authors affirms that human research participants provided informed consent for publication.

Declaration of generative AI in scientific writing The authors used ChatGPT to edit the text to improve readability and language of this work. During and after use of these tools, the authors reviewed the content.

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