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RESEARCH ARTICLE

Measuring the Occupational Stress in Pre-service Early Childhood Teachers: A Psychometric Examination of the Persian Version of Work-related Behaviour Patterns (P-AVEM)

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ABSTRACT

Work-related behavior patterns toward stressor experiences reflect the staff's attitude toward their professional requirements. The work-related behavior experience patterns questionnaire (AVEM) has been developed to determine the work-related patterns of people in the face of job stress. The present study examined the psychometric properties of the Persian version of the AVEM in pre-service early childhood teachers- student teachers who are enrolled in a teacher education program and working toward teacher certification (n=429, 59.67% female). The confirmatory factor analysis results showed an 11-factor structure resembling the original factor structure in the Persian language. Additionally, results showed that the Persian version of the AVEM demonstrated high internal consistency and test-retest reliability. Overall, the findings support the validity and reliability of the Persian version of the AVEM, which can be used to assess work-related behavior and experience patterns. The AVEM can be used during pre-service teachers' education to evaluate the extent to which they report work behaviors associated with occupational stress and dissatisfaction. Pre-service early childhood teachers who tend to feel overwhelmed and helpless in stressful work situations should be identified early so that they can be offered support.

introduction

People who work at an organization are the primary resource and the driving force to realizing the organization's goals. If organizations pay attention to their staff's well-being, they can dedicate their team to the organization's purpose. However, boosting staff's well-being revolves around both physical and psychological aspects of health. One of the most frequently raised issues in health and welfare is work-related stress (Kalani et al., 2017). Employees are vulnerable to stress and are exposed to various demands and conditions from their job (Voltmer et al., 2021). When individuals feel unable to meet the requests and face the challenges, they may experience stress (Böckelmann et al., 2022).

Studies have reported that jobs involving interaction with people, like teaching, are at risk of burnout syndrome because of the degree of occupational stress (Harper & Wilson, 2020; Seo & Yuh, 2022). Assessing the mental health risks of 67 occupations demonstrated that teaching significantly increases the risk of poor mental health and that teachers are 3.4 times more at risk than other professions (Hasselhorn & Nübling, 2004). Research among Iranian teachers has also shown that job stress and burnout in teachers endanger their mental health and quality of life (Badri Azarin et al., 2014; Bayani & Samiei, 2015). habibi asgarabad et al. (2007)habibi asgarabad et al. (2007)habibi asgarabad et al. (2007) investigated the level of stress in 430 teachers in one of the provinces in Iran and reported that 30.50% were at high risk and 3.2% were at very high risk of occupational stress. Ghadimi moghadam and Hosseini tabatabaei (2006)Ghadimi moghadam and Hosseini tabatabaei (2006)Ghadimi moghadam and Hosseini tabatabaei (2006) investigated the prevalence of burnout syndrome among teachers in different cities in Iran and found that most subjects (69%) suffer from mild to severe degrees of burnout. Successfully dealing with the diverse needs of students while maintaining health is a central demand for the teaching profession, which requires resources, such as self-efficacy expectations, attitude toward inclusion, and self-regulation skills (Harper & Wilson, 2020; Seo & Yuh, 2022). Although the amount of interaction does not equal more professional burnout (Betke et al., 2021; Otrębski, 2023), the intensity is significantly conditioned by compelling struggles with professional problems and the individual mode of coping with work requirements by creating a specific defense factor in critical and complex situations. Providing pre-service teachers with these demands and preventive training is crucial to addressing health and teaching-relevant resources during the university phase of education. However, little empirical evidence exists on the extent to which inclusive teacher self-efficacy is expected by attitudes toward inclusion, and self-regulation skills among pre-service teachers (Amini et al., 2011; Gustems-Carnicer et al., 2019; Hacker et al., 2008; Harmsen et al., 2018; Nabavi, 2021).

Occupational stress literature suggests diverse approaches to identifying determinants of the structure of burnout (Kalani et al., 2017), which deals with severe mental disorders and the experience perception of work-related stress (Pilger et al., 2018; Siegrist & Li, 2020). In fact, in both

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models of transactional stress (Lazarus & Folkman, 1984) and the salutogenic (Antonovsky, 1987) analyzing risk factors/resources can lead to early identification of potential future health risks such as excessive professional commitment, low-stress resistance, and limited emotional well-being (Mašková, 2023; Siegrist & Li, 2020). While most previous research has focused on symptoms and pathology, assessing factors that promote and support adjustment is a research gap (Sankelo & Åkerblad, 2009). Investigating how people stay healthy while enduring occupational stress, Schaarschmidt and Fischer (2008)Schaarschmidt and Fischer (2008)Schaarschmidt and Fischer (2008), developed a theoretical and methodological framework describing eleven dimensions in the context of work that can be risk factors/health resources, in addition to work engagement addressed in Rosenman and Friedman's type A behavior, these dimensions cover the domains of stress resistance and emotional well-being. The approach goes beyond simply identifying stressors and symptoms, even if represented in the work-related behavior and experience patterns questionnaire (AVEM) (Schaarschmidt & Fischer, 2008).

Work-related behaviors and experience patterns

Behavior towards work expresses the way to deal with professional demands. Employers or regulations merely do not impose these attitudes and the employees have responsibility for what happens (Napora et al., 2017). Fischer and Schaarschmidt (2003)Fischer and Schaarschmidt (2003)Fischer and Schaarschmidt (2003), based on the concept of coping with stress formulated by Lazarus, created a model of behavior patterns and experiences at work (i.e., known initially as Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM) (Antonovsky, 1987; Lazarus, 2000; Napora et al., 2017; Schaarschmidt & Fischer, 1997; Voltmer et al., 2007). Various factors put individuals' functioning or psychological health in danger, as well as root stress experiences in the work environment, leading to the development of work-related behavior and experience patterns (AVEM) questionnaire (AVEM) by Schaarschmidt and Fischer. AVEM helps measure professional occupation-related behaviors and lifestyles, opportunities, early diagnosis of health-related risks, taking urgent precautions against them, and putting them into action. This is beyond assessing stress symptoms given physical and emotional complaints. In addition, AVEM developed in Germany has adapted to many languages, which indicates that this instrument is free of culture (Fischer & Schaarschmidt, 2003; Schaarschmidt & Kieschke, 2013). Adopting the resource-oriented approach, AVEM is focused on coping with stressful situations and can be used as a diagnostic questionnaire from the point of view of health considerations (Gencer et al., 2010; Qudsyi et al., 2019). The purpose of developing the questionnaire is to identify the particular personality types of people on this requirement. The patterns shown indicate the emotional health level associated with people's work-related behavior (Schaarschmidt & Kieschke, 2013). Three main areas are covered by the AVEM: professional commitment, adaptability, and subjective well-being in the workplace. These broad domains are assessed using 11 separate scales, such as the subjective importance of work, professional ambition, or social support experience (Schaarschmidt & Kieschke, 2013). A body of previous empirical findings has confirmed these four types (Hohensee & Weber, 2022).

Pattern G is a healthy pattern in which the individual is happy and has all the necessary predispositions for personal and professional development. Individuals identify with their profession as a source of satisfaction and emotional well-being. People with such traits cope with work-related problems more frequently through positive thinking, direct action, and help-seeking (Napora et al., 2017) and rarely show signs of mental illness (Napora et al., 2017; Zimmermann et al., 2012). They are characterized by more personal resources: emotional intelligence (Napora et al., 2017) and a sense of coherence (Basińska et al., 2011). In addition, they have a higher level of job satisfaction than those grouped as pattern S – Savings, pattern A – Excessively burdened, and pattern B – Burnt-out. Pattern S naming reflects the individual's attitude towards work, which points to the attitude of individual savings investment at work and protection of own resources. It is mainly characterized by low subjective importance of work, professional ambition and willingness to expend energy, and a relatively low level of excellence in work (Gander et al., 2012; Pavot & Diener, 1993). Pattern S people who work in savings more frequently face work-related problems using the avoidance strategy (Napora et al., 2017). Pattern A refers to the pattern in which employees tend to be overly involved in work-related matters and complete their tasks with high perfectionism. They apply positive thinking to work and act directly; however, this mode of operation is characterized by a propensity to become overly involved in occupational matters, thus creating a risk for somatic and mental disorders (Basińska et al., 2011; Napora et al., 2017). Pattern B as the burnout pattern shows decreased professional commitment, low sense of subjective importance of the job, reduced resilience to stress, and poor understanding of inner balance. Individuals with burnout more frequently present with somatic symptoms, anxiety, insomnia, depression (Bauer et al., 2006; Napora et al., 2017) worse physical condition, and psychopathological symptoms (Bauer et al., 2006). Avoidance and resignation are the most common strategies for coping with work-related problems (Napora et al., 2017) which are not beneficial for efficiency because they include avoiding stressful situations and blocking stress from affecting emotional balance to protect mental health (Baka & Basinska, 2016).

This study

Previous studies, have shown that coping with interpersonal processes or the problems teachers are continuously confronted with is one of the primary factors influencing teacher health (Bauer et al., 2006; Unterbrink et al., 2008). These aspects also apply to student teachers (Hacker et al., 2008; Henecka & Lipowsky, 2004; Kostrzewa, 2007; Schröder & Kieschke, 2006; Schubarth et al., 2007) Student teachers, especially in the practical semester, are exposed to stress for several reasons and therefore deserve special attention. On the one hand, they are exposed to continual evaluation and judgment as both ‘‘instructing and learning’’ (or tutored and tutoring) trainees; Besides, they are anticipated to assume the role of confident teaching figures, leading students and classes, and also to represent themselves as educators and be acknowledged as such during parent-teacher meetings. (Zimmermann et al., 2012). In this regard, the results of a study have shown that almost half (46.2%) of all participants fell into the two AVEM risk patterns, which indicates that these students assess the practical semester as particularly stressful, and almost every fourth student teacher during the practical semester feels exposed to chronic exhaustion and resignation in the first weeks of the trainee program (Bolte, 2021). Other studies have also shown that student teachers may show unhealthy work-related behavior patterns due to their stressful job conditions. Since teaching is an extremely demanding profession, it is crucial for student teachers to meet the personal prerequisites for their daily work, including healthy attitudes, effective coping mechanisms, and skills. Nevertheless, personal competencies alone are insufficient; adequate preparation for their profession is also essential.

AVEM was developed in German and then adapted to other languages to reveal the different emotional issues in health. AVEM is helpful for the professional difficulties, encountered at work by expressing depressive behaviors and lifestyle habits likely to affect their health. In addition, this scale provides opportunities for early diagnosis of health-related risks, and takes urgent action against them (Fischer & Schaarschmidt, 2003) . As teaching is a demanding profession, it is important that teachers take steps to identify risks early, even when they are still students and before they officially start working.. Therefore, the present study aims to address this gap by providing AVEM psychometric properties to assess required resources, especially necessary for encounters with stress related to work. As we know, this is the first study to

investigate the psychometric properties of the AVEM questionnaire for pre-service early childhood teachers in Markazi Province - Iran Therefore, the two questions that this study is answering are:

What is the validity of the Persian form of the AVEM questionnaire in pre-service early childhood teachers?

What is the reliability of the Persian form of the AVEM questionnaire in pre-service early childhood teachers?

Method

Participants

Using the convenience sampling method, the total sample (*n*=429 Iranian pre-service early childhood teachers), including 184 married participants (42.89%) and 256 women (59.67%), responded to an online survey. Specifically, participants were chosen from four teachers' education university in Markazi province-Iran . The average age of the sample was 21.52 years (SD = 1.67). The summary of demographic information is presented in Table 1.

Table 1. Sample Demographic Information

	n=429	
	n	%
Gender		
male	173	40.32
Female	256	59.67
marital status		
Single	245	57.10
Married	184	42.89

Note. N=429.

Measures

Demographic Scale. The demographic questionnaire consists of questions about the participant's age, sex, and marital status.

Work-related behavior and experiences patterns questionnaires. Work-related behavior and experiences patterns questionnaires were developed by Schaarschmidt & Fischer (Schaarschmidt & Fischer, 1997; Schaarschmidt & Fischer, 2008). The structure of this questionnaire is such that it addresses three main areas and eleven scales. Each scale is also measured by six items (i.e., sixty-six items in total). The first area, i.e., professional commitment, includes five scales (subjective significance of work, professional ambition, tendency to exert, striving for perfection, and emotional distancing)—the emotional distancing loads on the second factor of professional commitment and the secondary element of resilience. The authors of the questionnaire prefer to add it to the secondary factor resilience for content reasons. The second area is called resistance to stress (resilience) which consists of three scales: balance and mental stability, resignation tendencies, and active coping with problems. The third area, subjective well-being, consists of three scales, i.e., satisfaction with work, satisfaction with life, and the experience of social support.

Items are responded to on a 5-point Likert scale using the following response options from 1 = strongly disagree to 5 = strongly agree. In addition, this questionnaire allows differentiation between four patterns of work-related experience and coping behavior patterns when people encounter job stress. Including G "Good Health," S "sparing of investment at work or Unambitious," A "risk pattern ambition or Overexertion," and B "risk pattern burnout."

Without exception, pattern G shows the most favorable, while risk models A and B show the most negative association with employee health. Although validation criteria were very diverse: from subjective statements about the person's well-being, perceived work skills, and assessment of current workload, to objective indicators of coping ability (days off work, physiological parameters). Schaarschmidt and Fischer (1997)Schaarschmidt and Fischer (1997)Schaarschmidt and Fischer (1997) confirmed the validity and reliability of this questionnaire's original version (in German). They have confirmed the construct validity of AVEM through factor analysis and cluster analysis and reported that both factor structure and cluster structure of AVEM are confirmed, repeatable and reliable. Also, they have reported that based on the results of Discriminant Analysis, the degree of probability of correctly classified cases in each of the four AVEM patterns was 94.3%.

Also Kieschke and Schaarschmidt (2008)Kieschke and Schaarschmidt (2008)Kieschke and Schaarschmidt (2008) collected AVEM psychometric data from several German samples between 2000 and 2005 in six different occupational fields, whose Cronbach's alphas are presented in Table 3. van Dick and Wagner (2001)van Dick and Wagner (2001)van Dick and Wagner (2001) also evaluated the psychometric properties of AVEM on a sample of 434 German school teachers. They used an exploratory factor analysis to measure the construct validity, to examine the criterion, convergent and divergent validity of the relationship of AVEM subscales with physical complaints, days of absence, job stress, retirement intention and organizational citizenship behavior, coping behavior, social support and Job Diagnostic Survey (JDS) and used Cronbach's alpha to check internal consistency. They reported that the obtained factor analysis and reliability replicate the results of (Schaarschmidt & Fischer, 1997). They also reported that, in general, the correlation of AVEM with the mentioned criteria shows convergent, divergent, and relatively good criterion validity. They have concluded that AVEM is reliable and valid and seems useful for use in teacher research. Gencer et al. (2010)Gencer et al. (2010)Gencer et al. (2010) also reviewed the validity and reliability of the Turkish translation of AVEM. They reported that Cronbach's alpha coefficients for 11 AVEM subscales ranged from 0.72 to 0.85. Qudsyi et al. (2019)Qudsyi et al. (2019)Qudsyi et al. (2019) also reported that the Indonesian version of the AVEM test has validity and reliability and can be used to measure empirical patterns and work-related behavior among Indonesians.

Procedure

Receiving permission and the AVEM package in German from the AVEM questionnaire developer (Andreas W. Fischer) through email, the paper's approval was obtained from the university ethical committee (Approval ID: IR.UI.REC.1401.031). Researchers followed standard guidelines for phases of the process of translation and back-translation (Sousa & Rojjanasrirat, 2011). First, two independent collaborators fluent in Persian and German languages whose mother language was Persian revised a first translation of the scale for the Persian language, and any disagreement was solved by reaching a consensus. Then, a native German speaker performed a back-translation compared with the original by the two psychologists. Twenty pre-service early childhood teachers also conducted the AVEM Persian version to fulfill the scale and report any doubts, questions, or misunderstandings about the clarity of the instructions, response format, and sentence structure (Table 2).

After receiving this feedback, we concluded this process and began the data recruitment. Pre-service early childhood teachers as participants were recruited using convenience sampling. We first received cooperation permission from the Farhangian University, management of campuses in Markazi Province. Due to the Covid-19 outbreak, data was collected online by uploading questions to a website at "www.porsline.ir". The questionnaire link was disseminated through pre-service early childhood teachers' social networks in teachers' education institutes in Markazi province from November 9, 2021, to November 29, 2021. After obtaining the informed consent of the participants in this study, the researchers sent them the online questionnaire link. In addition to the link to the questionnaire, written and audio notice files were also attached to explain the purpose of the study, assurance of the anonymity of the questionnaires, voluntary participation, and the ability to withdraw at any time. In the end, 463 participants responded to the questionnaire, and 34 incomplete or non-eligible questionnaires were excluded from the data analysis.

Table 2. Persian version of Work-related Behaviour Patterns (P-AVEM)

		Items
1	Persian	برای من، کار مهمترین بخش زندگی است
	Geman	*Die Arbeit ist für mich der wichtigste Lebensinhalt.*
	English	*Work is the most important element in my life.*
2	Persian	من بیشتر از دوستان و آشنایانم دوست دارم در حرفه خود پیشرفت کنم
	Geman	*Ich möchte beruflich weiterkommen, als es die meisten meiner Bekannten geschafft haben.*
	English	*I want to achieve more in my career than most of the people I know.*
3	Persian	در صورت لزوم تا جایی که خسته شوم، کار می‌کنم
	Geman	*Wenn es sein muss, arbeite ich bis zur Erschöpfung.*
	English	*If necessary, I work until I am exhausted*
4	Persian	کار من هرگز نباید عیب و ایرادی داشته باشد
	Geman	*Meine Arbeit soll stets ohne Fehl und Tadel sein.*
	English	*My work should never contain errors or deficiencies*
5	Persian	پس از پایان کار، آن را فراموش می کنم
	Geman	*Zum Feierabend ist die Arbeit für mich vergessen.*
	English	*After work is over I can forget about it quickly*
6	Persian	اگر در کاری موفق نشوم به سرعت تسلیم می شوم
	Geman	*Wenn ich keinen Erfolg habe, resigniere ich schnell.*
	English	*I quickly resign myself to lack of success*
7	Persian	برای من، مشکلات به این دلیل وجود دارند که بتوانم بر آنها غلبه کنم
	Geman	*Für mich sind Schwierigkeiten dazu da, dass ich sie überwinde.*
	English	*For me, difficulties are there to overcome*
8	Persian	من به آسانی ناراحت نمی‌شوم
	Geman	*Mich bringt so leicht nichts aus der Ruhe.*
	English	*I don't get upset easily*
9	Persian	من در زندگی حرفه ای ام تا کنون کاملا موفق بوده ام
	Geman	*Mein bisheriges Berufsleben war recht erfolgreich.*
	English	*Until now I have been successful in my work*
10	Persian	تا به امروز از زندگی ام رضایت داشته ام
	Geman	*Mit meinem bisherigen Leben kann ich zufrieden sein.*
	English	*So far, I have been satisfied with my life*
11	Persian	همسر و نزدیکانم شغل مرا درک می‌کنند
	Geman	*Mein Partner/meine Partnerin zeigt Verständnis für meine Arbeit.*
	English	*My partner shows understandig for my work*
12	Persian	شغلم همه چیز من است
	Geman	*Die Arbeit ist mein ein und alles.*
	English	*My work is everything to me*
13	Persian	پیشرفت در زندگی حرفه ای ام اهمیت کمی برای من دارد
	Geman	*Berufliche Karriere bedeutet mir wenig.*
	English	*My career doesn't mean much to me*
14	Persian	وقتی کار می‌کنم به سلامت شخصی خودم اهمیت نمی‌دهم
	Geman	*Bei der Arbeit kenne ich keine Schonung.*
	English	*I always work full out*
15	Persian	ترجیح می‌دهم به جای اینکه نتیجه کارم را با اشتباه تحویل دهم، سه بار آن را چک کنم
	Geman	*Ich kontrolliere lieber noch dreimal nach, als dass ich fehlerhafte Arbeitsergebnisse abliefere.*
	English	*I prefer to check everything three times over rather than hand in work results containing mistakes*
16	Persian	من حتی در اوقات فراغتم هم در مورد مشکلات محل کار فکر می‌کنم
	Geman	*Auch in der Freizeit beschäftigen mich viele Arbeitsprobleme.*
	English	*I still go on thinking about work problems in my leisure time*
17	Persian	کنار آمدن با شکست برایم بسیار سخت است
	Geman	*Misserfolge kann ich nur schwer verkraften.*
	English	*I find it difficult to cope with lack of success*
18	Persian	اگر در کاری موفق نشدم، بیشتر تلاش می کنم
	Geman	*Wenn mir etwas nicht gelingt, sage ich mir: Jetzt erst recht!*
	English	*If I don't succeed, I say to myself: This time nothing will stop me!*
19	Persian	من آدم بی قراری هستم
	Geman	*Ich bin ein ruheloser Mensch.*
	English	*I am a restless person.*

Continued table 2 .Persian version of Work-related Behaviour Patterns (P-A VEM)

20	Persian	در کار حرفه‌ای‌ام تاکنون بیشتر موفقیت داشتم تا نا امیدی
	Geman	*In meiner bisherigen Berufslaufbahn habe ich mehr Erfolge als Enttäuschungen erlebt.*
	English	*In my career up till now I have experienced more success than disappointments*
21	Persian	در کل خوشحال و راضی هستم
	Geman	*Im Großen und Ganzen bin ich glücklich und zufrieden.*
	English	*By and large, I am happy and content*
22	Persian	خانواده من به مشکلاتی که سر کار دارم علاقه چندانی نشان نمی‌دهند.
	Geman	*Meine Familie interessiert sich nur wenig für meine Arbeitsprobleme.*
	English	*My family isn't very interested in my problems at work*
23	Persian	حتی بدون شغلم هم می‌توانم شاد باشم
	Geman	*Ich könnte auch ohne meine Arbeit ganz glücklich sein.*
	English	*I could be quite happy without my work*
24	Persian	در زمینه پیشرفت در کارم، بسیار جاه طلب هستم
	Geman	*Was meine berufliche Entwicklung angeht, so halte ich mich für ziemlich ehrgeizig.*
	English	*As far as my career is concerned, I consider myself to be fairly ambitious.*
25	Persian	بیشتر از آنچه باید کار می‌کنم
	Geman	*Ich arbeite wohl mehr als ich sollte.*
	English	*I work more than I really should*
26	Persian	برایم خیلی مهم هست که اشتباهی در کارم نداشته باشم
	Geman	*Bei meiner Arbeit habe ich den Ehrgeiz, keinerlei Fehler zu machen.*
	English	*I have the ambition not to make any mistakes at work*
27	Persian	بعد از اتمام کار به راحتی مسائل مربوط به کار را فراموش میکنم
	Geman	*Nach der Arbeit kann ich ohne Probleme abschalten.*
	English	*After work I can switch off and easily forget problems*
28	Persian	شکست در کار به راحتی می تواند من را دلسرد کند.
	Geman	*Berufliche Fehlschläge können mich leicht entmutigen.*
	English	*Failure at work is very discouraging for me*
29	Persian	عدم موفقیت نه تنها مرا ناامید نمی‌کند، بلکه باعث می‌شود دفعه بعد بیشتر تلاش کنم
	Geman	*Misserfolge werfen mich nicht um, sondern veranlassen mich zu noch stärkerer Anstrengung.*
	English	*Lack of success doesn't discourage me, but makes me try even harder next time*
30	Persian	فکر می‌کنم سرم خیلی شلوغ هست
	Geman	*Ich glaube, dass ich ziemlich hektisch bin.*
	English	*I consider myself to be rather hectic*
31	Persian	تا به امروز، موفقیت چشمگیری را در محل کار کسب نکرده ام
	Geman	*Wirkliche berufliche Erfolge sind mir bisher versagt geblieben.*
	English	*So far, I haven't had great success at work*
32	Persian	من دلایل زیادی برای خوشبین بودن به آینده ام دارم
	Geman	*Ich habe allen Grund, meine Zukunft optimistisch zu sehen.*
	English	*I have good reason to look into the future with optimism*
33	Persian	دوست دارم همسرم و نزدیکانم درک بیشتری از کار من داشته باشد
	Geman	*Von meinem Partner/meiner Partnerin wünschte ich mir mehr Rücksichtnahme auf meine beruflichen Aufgaben und Probleme.*
	English	*I would like my partner[†] to have more consideration for my work*
34	Persian	شغلم برایم خیلی مهم است و من به شغلم احتیاج دارم
	Geman	*Ich brauche die Arbeit wie die Luft zum Atmen.*
	English	*I need my work like the air I breathe*
35	Persian	من بیش از سایرین تمایل دارم تا در مسیر شغلی‌ام پیشرفت کنم
	Geman	*Ich strebe nach höheren beruflichen Zielen als die meisten anderen.*
	English	*I am aiming to get on further career-wise than most other people*
36	Persian	من تمایل دارم بیشتر از توانایی هایم کار کنم
	Geman	*Ich neige dazu, über meine Kräfte hinaus zu arbeiten.*
	English	*I tend to overwork*
37	Persian	هر کاری می کنم باید بدون نقص باشد.
	Geman	*Was immer ich tue, es muss perfekt sein.*
	English	*Whatever I do, it must be perfect*
38	Persian	من در اوقات فراغت به شغل و کارم فکر نمیکنم
	Geman	*Feierabend ist Feierabend, da verschwende ich keinen Gedanken mehr an die Arbeit.*
	English	*Leisure time is leisure time – I don't lose any sleep over work*
39	Persian	اگر در محل کار با شکست روبرو شوم، افسرده می شوم
	Geman	*Wenn ich in der Arbeit erfolglos bin, deprimiert mich das sehr.*
	English	*Failure at work makes me very depressed*
40	Persian	اطمینان دارم که می توانم با تمام چالش های زندگی در آینده کنار بیایم
	Geman	*Ich bin mir sicher, dass ich auch die künftigen Anforderungen des Lebens gut bewältigen kann.*
	English	*I am sure that I'll be able to deal with all future challenges in my life*

[†] or the person to whom you are closest

Continued table 2 .Persian version of Work-related Behaviour Patterns (P-A VEM)

41	Persian	برای اطرافیانم منبع آرامش خاطر هستم
	Geman	*Ich glaube, ich bin ein ruhender Pol in meinem Umfeld.*
	English	*I think I am a calming influence on the people around me*
42	Persian	تا به امروز در شغلم تقریباً در همه چیز تاکنون موفق بوده ام
	Geman	*In meiner beruflichen Entwicklung ist mir bisher fast alles gelungen.*
	English	*So far, I have been very successful in my career*
43	Persian	دلیلی ندارد که از زندگی ام ناراضی باشم
	Geman	*Ich kann mich über mein Leben in keiner Weise beklagen.*
	English	*I have no reason to be at all dissatisfied with my life*
44	Persian	من از حمایت تمام و کمال خانواده ام برخوردار ام
	Geman	*Bei meiner Familie finde ich jede Unterstützung.*
	English	*I have the full support of my family*
45	Persian	واقعاً نمی دانم چگونه می توانم بدون کارم زندگی کنم
	Geman	*Ich wüsste nicht, wie ich ohne Arbeit leben sollte.*
	English	*I don't know how I could live without my work*
46	Persian	برای آینده شغلی ام برنامه ها و نقشه های بزرگی دارم
	Geman	*Für meine berufliche Zukunft habe ich mir viel vorgenommen.*
	English	*I have great plans for my future career*
47	Persian	اکثر روزها وقت کافی ندارم
	Geman	*Mein Tagesablauf ist durch chronischen Zeitmangel bestimmt.*
	English	*My daily routine is characterized by a chronic lack of time*
48	Persian	تا زمانی که کاملاً از نتیجه کارم رضایت نداشته باشم آن را تمام شده نمی دانم
	Geman	*Für mich ist die Arbeit erst dann getan, wenn ich rundum mit dem Ergebnis zufrieden bin.*
	English	*I don't consider my work to be finished until I am completely satisfied with the result*
49	Persian	مشکلات کاری تمام روز ذهن مرا درگیر می کند
	Geman	*Arbeitsprobleme beschäftigen mich eigentlich den ganzen Tag.*
	English	*Problems at work occupy my mind the whole day*
50	Persian	من به راحتی ناامید می شوم حتی اگر تمام تلاشم را کرده باشم و موفق نشوم
	Geman	*Ich verliere leicht den Mut, wenn ich trotz Anstrengung keinen Erfolg habe.*
	English	*I am easily discouraged when I am unsuccessful, even though I have tried hard*
51	Persian	عدم موفقیت مرا به چالش می کشد تا بیشتر تلاش کنم
	Geman	*Ein Misserfolg kann bei mir neue Kräfte wecken.*
	English	*Lack of success can challenge me to try harder*
52	Persian	تقریباً می توانم در تمامی موقعیت ها آرام بوده و بر خودم کنترل داشته باشم
	Geman	*Ich kann mich in fast allen Situationen ruhig und bedächtig verhalten.*
	English	*I can remain calm and collected in almost all situations*
53	Persian	زندگی من تاکنون با موفقیت حرفه ای همراه بوده است
	Geman	*Mein bisheriges Leben ist durch beruflichen Erfolg gekennzeichnet.*
	English	*My life up till now has been characterized by success at work*
54	Persian	من در برخی از جنبه های زندگی کاملا ناامید هستم
	Geman	*Von manchen Seiten des Lebens bin ich ziemlich enttäuscht.*
	English	*I have been quite disappointed by some aspects of my life*
55	Persian	گاهی اوقات آرزو می کنم کاش اطرافیان بیشتر از من حمایت می کردند
	Geman	*Manchmal wünschte ich mir mehr Unterstützung durch die Menschen meiner Umgebung.*
	English	*Sometimes I wish I could receive more support from the people around me*
56	Persian	در زندگی چیزهای مهمتر از کار هم وجود دارند
	Geman	*Es gibt Wichtigeres im Leben als die Arbeit.*
	English	*There are things in life that are more important than work*
57	Persian	یکی از مهمترین اهداف زندگی ام، موفقیت شغلی است
	Geman	*Beruflicher Erfolg ist für mich ein wichtiges Lebensziel.*
	English	*Success at work is an important aim in my life*
58	Persian	من تمامی توانایی ام را برای انجام شغلم بکار می گیرم
	Geman	*In der Arbeit verausgabe ich mich stark.*
	English	*I put everything I've got into my work*
59	Persian	دوست ندارم کاری را به اتمام برسانم اگر می شد آن را بهتر انجام داد
	Geman	*Es widerstrebt mir, wenn ich eine Arbeit abschließen muss, obwohl sie noch verbessert werden könnte.*
	English	*I don't like having to finish work, which could be improved on*
60	Persian	همیشه فکرم حول محور شغلم در گردش است
	Geman	*Meine Gedanken kreisen fast nur um die Arbeit.*
	English	*My thoughts are always circling round my work*
61	Persian	اگر به نوعی در کار شکست را تجربه کنم، خیلی مایوس می شوم
	Geman	*Wenn ich irgendwo versagt habe, kann mich das ziemlich mutlos machen.*
	English	*If I have experienced some kind of failure, I can feel very discouraged*
62	Persian	اگر در کاری موفق نشوم، پافشاری می کنم و بیشتر تلاش می کنم
	Geman	*Wenn mir etwas nicht gelingt, bleibe ich hartnäckig und strenge mich um so mehr an.*
	English	*If I have experienced some kind of failure, I can feel very discouraged*

Continued table 2 .Persian version of Work-related Behaviour Patterns (P-A VEM)

63	Persian	در میان غوغا و هیاهو، آرامش خودم را حفظ می‌کنم
	Geman	*Hektik und Aufregung um mich herum lassen mich kalt.*
	English	*I remain calm in the midst of turmoil*
64	Persian	از موفقیت های شغلی ام احساس غرور و افتخار می‌کنم
	Geman	*Meine beruflichen Leistungen können sich sehen lassen.*
	English	*I can feel proud of my achievements at work*
65	Persian	آدم های کمی پیدا می‌شوند که بیشتر من خوشحال باشند
	Geman	*Es dürfte nur wenige glücklichere Menschen geben als ich es bin.*
	English	*There can't be many people who are happier than I am*
66	Persian	وقتی به کمک و راهنمایی نیاز دارم، همواره کسی را دارم که آن را از من دریغ نکند.
	Geman	*Wenn ich mal Rat und Hilfe brauche, ist immer jemand da.*
	English	*When I need help and advice, there is always someone there*

Notes.
The full AVEM form (including the instructions to respondents) is available in Persian in the electronic supplementary material, together with an How to score items of the AVEM.

Data Analysis

Psychometric properties of the Persian version of the AVEM (P-AVEM) were assessed by several statistical tests as follows.

Validity

To examine the factor structure of P-AVEM, a confirmatory factor analysis (CFA) was conducted using Structural Equation Modeling (SEM) in AMOS, version 24. Standard data-model fit statistics and their associated decision rules were used to assess the goodness of fit of the latent measurement models. Insignificant model chi-square goodness-of-fit (set at 0.05) signifies model fit. For appropriate approximate indexes, the goodness of fit index (GFI), adjusted goodness of fit index (AGFI), incremental fit index (IFI), and comparative fit index (CFI) of above 0.9 would indicate model fit (Kline, 2015). For another approximate appropriate index, root mean square error of approximation (RMSEA), and a value less than 0.08 would signify a reasonable model fit (Stevens, 2012).

Reliability

The internal consistency was assessed using Cronbach's alpha, with a coefficient equal to or greater than 0.70, indicating adequate to excellent reliability (Cronbach, 1951). In addition, the intra-class correlation coefficient (ICC) was used to assess test-retest reliability, with 30 participants completing the questionnaire twice at a four-week interval. ICC values of .40 or above are indicative of satisfactory (r=0.81–1.0 as excellent, 0.61–0.80 very good, 0.41–0.60 good, 0.21–0.40 fair, and 0.0 to 0.20 poor) (Munro, 2005). We used SPSS, version 22, for reliability analysis.

Results

We used confirmatory factor analysis to examine the original 11-factor structure of the AVEM (first-order factor analysis) and 3-domonate factor structure (second order factor analysis) in the Persian language. Descriptive statistics and the structure of the AVEM were established (see Table 3).

Table 3. Descriptive statistics and reliability coefficients

AVEM subscales	Item number	M	SD	Cronbach's alpha in present study	Cronbach's alpha in (Kieschke & Schaarschmidt, 2008)						test-retest reliability in present study
					TEA	OPI	PPE	PFB	NUR	EPR	
Subjective significance of work	1, 12, 23, 34, 45, 56	12.47	3.43	.84	.84	.84	.85	.86	.83	.84	.77**
Professional ambition	2, 13, 24, 35, 46, 57	15.68	2.65	.76	.83	.85	.86	.85	.84	.81	.69**
Tendency to exert	3, 14, 25, 36, 47, 58	13.25	3.18	.73	.83	.79	.74	.75	.76	.79	.73**
Striving for perfection	4, 15, 26, 37, 48, 59,	20.13	3.15	.77	.86	.81	.80	.80	.78	.85	.74**
Emotional distancing	5, 16, 27, 38, 49, 60	9.35	2.66	.69	.86	.85	.86	.83	.87	.85	.69**
Resignation tendencies	6, 17, 28, 38, 49, 60	10.25	.54	.78	.84	.80	.80	.82	.77	.85	.83**
Active coping with problems	7, 18, 29, 40, 51, 62	23.53	3.62	.73	.81	.80	.8	.79	.77	.81	.73**
Balance and mental stability	8, 19, 30, 41, 52, 63	14.30	2.78	.81	.83	.78	.79	.81	.80	.80	.69**
Satisfaction with work	9, 20, 31, 42, 53, 64	15.33	2.49	.87	.85	.82	.83	.81	.78	.85	.74**
Satisfaction with life	10, 21, 32, 43, 54, 65	15.66	2.91	.75	.83	.75	.78	.81	.80	.79	.83**
Experience of social support	11, 22, 33, 44, 55, 66	11.86	2.16	.71	.82	.74	.74	.75	.75	.81	.66**

Notes. N = 429. ** $p < 0.01$. TEA: teachers; OPI: officials in penal institutions; PPE: police personnel; PFB: professional fire brigade; NUR: nurses; EPR: entrepreneurs. Items 6-13-16-19-22-23-28-30-31-33-39-49-50-54-55-56-60-61 are scored inversely.

The AVEM first-order model that consists of 11 factors (66 items) obtained the required value of chi-square: $\chi^2/df = 2.84$, N = 429, and the model-to-data fit indices were very satisfactory: GFI=0.90, AGFI=0.91, IFI=0.95, CFI=0.93, TLI=0.93 and RMSEA=0.06 for the Persian version of AVEM. Also, The second order model that consists of 3 factors obtained the required value of chi-square: $\chi 2/df = 2.88$, N = 429, and the model-to-data fit indices were very satisfactory: GFI=0.89, AGFI=0.90, IFI=0.93, CFI=0.91, TLI=0.91, and RMSEA=0.06 for the Persian version of AVEM. Results are presented in Table 4.

Table 4. Confirmatory factor analysis fit indices Persian version of AVEM

Model	χ^2	(df)	GFI	AGFI	IFI	CFI	TLI	RMSEA
First order factor analysis	5760.646	2024	. 90	.91	.95	.93	.93	.06
Second order factor analysis	5966.716	2066	.89	.90	.93	.91	.91	.06

Notes. N = 429.

We also investigated the factorial structure across gender. The comparison test of two first-order and second-order models ($\Delta\chi^2$= 206.07, df= 42, p>0.001) shows that the two models have a significant difference, and Table 4 shows that the fit indices of the first-order model are higher. Therefore, the first-order factorial model is used for measurement invariance in gender groups.

To evaluate the configural model for each group, CFI=0.742, RMSEA=0.083, there is a lack of measurement invariance (i.e., measurement non-variance) indicating that the latent constructs cannot be measured and interpreted in the same way across gender, the same factorial structure doesn't hold across gender.

The value of these indicators indicates the fit of the AVEM questionnaire model with the data (Schumacker & Lomax, 2004). In the 11-factor model, all items loaded significantly (p<0.05) on their respective factors: subjective significance of work (factor loading =-0.45 to 0.89), professional ambition (factor loading =-0.44 to 0.98), the tendency to exert (factor loading =0.59 to 0.97), striving for perfection (factor loading =0.45 to 0.89), emotional distancing (factor loading =-0.45 to 0.95), resignation tendencies (factor loading =0.53 to 0.77), active coping with problems (factor loading =0.56 to 0.96), balance and mental stability (factor loading =0.46 to 0.85), satisfaction with work (factor loading =-0.54 to 0.96), satisfaction with life (factor loading =0.45 to 0.75), the experience of social support (factor loading =-0.49 to 0.79). See Table 5 for each item's factor loading.

Table 5. Confirmatory factor analysis on the Persian version of AVEM

Item	Factor loading	Item	Factor loading	Item	Factor loading
Factor 1: Subjective significance of work		Factor 5: Emotional distancing		Factor 9: Satisfaction with work	
1	.45	5	.64	9	.96
12	.75	16	-.78	20	.85
23	–.60	27	.56	31	–.54
34	.45	38	.95	42	.56
45	.89	49	–.45	53	.75
56	–.45	60	–.68	64	.75
Factor 2: Professional ambition		Factor 6: Resignation tendencies		Factor 10: Satisfaction with life	
2	.75	6	.77	10	.45
13	-.44	17	.69	21	.75
24	.51	28	.53	32	.60
35	.98	39	.64	43	.45
46	.56	50	.54	54	–.56
57	.79	61	.62	65	.63
Factor 3: Tendency to exert		Factor 7: Active coping with problems		Factor 11: Experience of social support	
3	.79	7	.53	11	.75
14	.64	18	.81	22	–.79
25	.97	29	.84	33	–.56
36	.59	40	.65	44	.54
47	.84	51	.96	55	–.49
58	.63	62	.54	66	.59
Factor 4: Striving for perfection		Factor 8: Balance and mental stability			
4	.89	8	.85		
15	.69	19	-.73		
26	.65	30	–.74		
37	.48	41	.56		
48	.45	52	.65		
59	.75	63	.46		

Notes. N = 429

Test-retest reliability was assessed by two consecutive administrations of the questionnaires at the four-week interval. Internal consistency was evaluated using Cronbach's alpha statistic for the total scale and domains. Cronbach's alpha values ranged from 0.69 to 0.82. In addition, ICC ranged from 0.56 to 0.74, indicating the temporal stability of the questionnaire (See Table 3). Evaluating data obtained from 429 pre-service early childhood teachers, we found the distribution of pattern groups in descending order to be: pattern "G" (33.3%), pattern "A group risk" (30.5%), pattern "S" (16.0%) and as pattern "B group risk" (20.2%).

Discussion

The work-related behavior and experience pattern (AVEM) questionnaire was developed to determine employees' patterns in the face of stress at work, providing the possibility to discover various emotional problems in work and health. In addition, this scale presents opportunities, especially in the early diagnosis of health-related risks, taking urgent precautions against risks and putting them into action (Fischer & Schaarschmidt, 2003). To assess future Iranian pre-service, early childhood teachers, the present study investigated the psychometric properties of the Persian version of AVEM among them. The confirmatory factor analysis showed a Persian 11-factor structure (first-order mode) and a 3-3-factor model (second-order model) resembling the original one. Also, it illustrated that the Persian version of AVEM had high internal consistency and test-retest reliability. In addition, the Persian version of the AVEM demonstrated excellent psychometric properties with acceptable to good Cronbach's alpha coefficients for all subscales. However, these results must be validated in other cultures to support

Schaarschmidt and Fischer's model. Compared with others, these results were consistent with the results of the original version (Fischer & Schaarschmidt, 2003) and comparable to another version in Turkey (Gencer et al., 2010) and Indonesia (Qudsyi et al., 2019). Overall, the results support the validity and reliability of the Persian version of the AVEM, which can be used to assess work-related behaviors and experience patterns.

As we know, three main areas are covered by the AVEM: professional commitment, adaptability, and subjective well-being in the workplace. These broad domains are assessed using 11 separate scales, such as the subjective importance of work, professional ambition, or social support experience (Schaarschmidt & Kieschke, 2013). Using cluster analysis of the sizes of the first AVEM sample (N = 1,598 various occupations) (Schaarschmidt & Fischer, 1996; Schaarschmidt & Fischer, 1997; Schaarschmidt & Fischer, 2008), identified four characteristic patterns, defined as "healthy" (pattern G), "Savings" (pattern S), "Over compulsion" (Risk pattern A), and "Burnout" (Risk pattern B). Various studies have empirically shown that the AVEM typology helps link workload and coping behavior to health (Schaarschmidt & Fischer, 1996). Validation criteria were very diverse: from subjective statements about the person's well-being, perceived work skills, and assessment of current workload, to objective indicators of coping ability (days off work, physiological parameters). Without exception, pattern G shows the most favorable, while risk models A and B show the most negative association with employee health. In the emotional exhaustion scale of the Maslach Burnout Inventory (Schaarschmidt & Fischer, 2008), the risk model associated with burnout B obtained the highest score.

The effect of teacher mental health and work stress has received increasing attention in many countries in recent years. Psychosocial stress at work is a long-standing problem in the teaching profession, and the consequences of the psychosocial load on teachers, as well as the risk of poor mental health, have been the subject of several epidemiological studies in recent years (Haydon et al., 2018); coping patterns and personality factors, such as low self-efficacy (Montgomery & A Rupp, 2005), lack of a proactive attitude (Schwarzer et al., 2000), unrealistic demands (Schmitz et al., 2002) and low job satisfaction may contribute to teachers' low mental health. These aspects also apply to future teachers or candidates for service (Amini et al., 2011; Gustems-Carnicer et al., 2019; Hacker et al., 2008; Harmsen et al., 2018; Nabavi, 2021).

AVEM can be used during pre-service early childhood teachers' education to assess the extent to which they report work behaviors associated with occupational stress and dissatisfaction (Oetjen, 2023). Pre-service teachers who tend to feel overwhelmed and helpless in stressful work situations should be identified early so they can be offered support (Böckelmann et al., 2022). In addition, considering AVEM allows distinguishing between four types of work-related behavior patterns in the face of occupational stress (Gencer et al., 2010; Qudsyi et al., 2019), more targeted interventions can be designed for each group of pre-service early childhood teachers (Amini et al., 2011; Gustems-Carnicer et al., 2019; Hacker et al., 2008; Harmsen et al., 2018; Nabavi, 2021).

In conclusion, this study showed that the AVEM scale is a reliable and valid measurement tool within the profession of teaching in asserting work-related behavior and experience patterns for pre-service teachers.

Limitations and future directions

When interpreting and generalizing the results, some limitations needed to be considered. Although the sample size was sufficiently large to run all of the conducted analyses, robustly, and the sample was reasonably representative regarding the demographic variables of teachers, first, it could be argued that the results were limited to the sample since the study only included teachers.

Second, as the cross-sectional design does not show a causal interpretation and the study was merely conducted to clear the status of the participants, future studies should favor longitudinal designs.

Third, acknowledging that teachers each year are different, it could be argued that the analyses should have been calculated separately for each year (e.g., freshmen should be separated from seniors).

Forth, In this study, we utilized an online questionnaire for data collection, which may introduce biases or distortions in our results due to potential issues such as self-selection bias, response bias, or misinterpretation of questions by participants. While online surveys offer convenience and access to a wider pool of respondents, it's important to acknowledge their limitations and consider potential implications for the reliability and validity of our findings.

Also, due to the fact that we did not include convergent and divergent validity in the models for measuring validity of AVEM, we suggest that future researchers should measure this type of validity in addition to other types of validity.

Disclosure statement

No potential conflict of interest was reported by the authors.

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Appendix 1.Persian Version of Work-related Behaviour Patterns (P-AVEM) with instructions

Instructions

To obtain the scores of each subscale, it is necessary to add the scores of the items belonging to each subscale. Also, some items are scored in reverse. To obtain the scores of the general domains, it is necessary to add the scores of the subscales belonging to it together.

components	subscales	items
professional commitment	Subjective significance of work	1, 12, 23, 34, 45, 56
	Professional ambition	2, 13, 24, 35, 46, 57
	Tendency to exert	3, 14, 25, 36, 47, 58
	Striving for perfection	4, 15, 26, 37, 48, 59
	Emotional distancing	5, 16, 27, 38, 49, 60
resistance to stress	Resignation tendencies	6, 17, 28, 39, 50, 61
	Effective coping with problems	7, 18, 29, 40, 51, 62
	Balance & stability	8, 19, 30, 41, 52, 63
subjective well-being	Satisfaction with work	9, 20, 31, 42, 53, 64
	Satisfaction with life	10, 21, 32, 43, 54, 65
	Experience of social support	11, 22, 33, 44, 55, 66

Questions to be scored in reverse: 6-13-16-19-22-23-28-30-31-33-39-49-50-54-55-56-60-61.

In order to obtain four patterns (G, S, A and B), it is necessary to perform a cluster analysis using the K-Means method and by setting the number 4 for the number of clusters. Then, based on the pattern in the table below, each pattern is identified. By examining the average of each domain in the four patterns produced by SPSS, each of the AVEM patterns can be identified. For example, the pattern that has the highest scores compared to other patterns in all three dimensions of professional commitment, resistance to stress and mental well-being should be named G pattern. The important point is that, according to what Sharsemest and Fisher (2003) have specified, the determination of patterns is not done with fixed numbers and averages, and they are determined only based on cluster analysis in each sample group/statistical community investigated. And in fact, it is the administrator of the questionnaire that determines the type of cluster based on the obtained averages of the overall domains of each cluster. In order to choose a model, a sample with a sufficient volume is definitely needed, and with only one sample, it is not possible to determine the pattern of his work behavior.

	subjective well-being			resistance to stress			professional commitment				
	G,S>A,B			G,S>A,B			G, A>S, B				
Comparison of patterns	Experience of social support	Satisfaction with life	Satisfaction with work	Balance & stability	Effective coping with problems	Resignation tendencies	Emotional distancing	Striving for perfection	Tendency to exert	Professional ambition	Subjective significance of work
Comparison of patterns	G>S>A=B	G>S>A>B	G>A>S>B	G>S>A=B	G>A>S>B	B>A>S>G	S>G>B>A	A>G>B>S	A>G=B>S	G>A>B>S	A>G>B>S

For more guidance, you can call 09134331058 or email
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