

WORK-RELATED BEHAVIOR AND EXPERIENCE PATTERNS OF MUSIC EDUCATORS – A BASIS FOR INTERVENTION

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Abstract

Objectives: Music educators are subjected to many physical and psychological stresses encountered in the workplace. These stresses could be counteracted by certain work-related behavior and experience patterns as personal resources to reduce the negative consequences of stress. The aim of the study was to determine the existing work-related behavioral and experiential patterns and the characteristics of the *Work-Related Behavior and Experience Patterns (Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM)* questionnaire dimensions in the professional group of music educators according to age group. **Material and Methods:** A total of 205 music educators (66.3% female) from various music schools in Germany participated in the online survey. The subjects were divided into 3 age groups (AG): AG I: ≤ 35 years, AG II: 36–45 years, AG III: ≥ 46 years. In addition to sociodemographic and occupational data, the standardized AVEM questionnaire was used according to Schaarschmidt and Fischer. The age and occupation-related data were evaluated in a correlation analysis with the expression of AVEM dimensions. **Results:** A total of 71.4% of the music educators were ≥ 46 years old group. Another 12.8% belonged to AG II, and 15.8% belonged to AG III. The sex distribution in the 3 age groups was comparable ($p = 0.261$). The expression of all AVEM dimensions was within the reference range. The most pronounced dimension, with a stanine value of $M \pm SD$ 5.2 ± 2.15 , was the willingness to spend. There was also no significant difference in the assignment to the 4 patterns in the 3 age groups ($p = 0.669$). Age showed a negative correlation with the experience of social support ($\rho = -0.354$). **Conclusions:** The age-independent and high intervention-requiring expressions of the AVEM risk patterns A and B led to the recommendation of workplace prevention and health promotion measures. Therefore, it seems reasonable to promote appropriate stress management measures and resilience during studies. *Int J Occup Med Environ Health*. 2024;37(2):176–93

Key words:

prevention, personal resources, health protection, AVEM, mental health, music school teachers

INTRODUCTION

The stress situation of music educators can be thought of as a combination of the stresses that, for the most part, occur in the everyday professional life of an instrumental/orchestral musician and teacher in general education schools. Among the many occupation-specific stresses experienced by professional musicians are occupational hygiene and environmental factors in the orchestra pit,

such as lighting, climate, breathing air, and noise exposure. In addition, there are physical stresses due to instrument-related forced postures, one-sided movements, and overload during intensive practicing [1] as well as psychological stress due to stage fright and the need for perfection [2–4]. It is also known that many musicians strive for perfection to a higher degree [4] because a personal position in the orchestra (*cf.* first violin or second violin)

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There was no funding for the sub-project presented here. For another sub-project of the overall study, which is not presented here, there was a framework agreement with a health insurance company to fund a model project in the context of developing a strategy for prevention and health promotion at a music school. This funding concerned the reimbursement of expenses for consumables.

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or as a soloist involves significant steps in the career and increases in payment. Insufficient perception and processing of psychological stress can therefore lead to the somatization of suppressed emotions and, e.g., musculoskeletal complaints or depressive moods [4]. These stresses can lead to work-related illnesses and occupational diseases – e.g., occupational diseases (Berufskrankheiten [BK]) No. 2301: Noise-induced hearing loss, BK No. 2115: Focal dystonia in instrumentalists – depending on the stresses and individual consequences [5]. The consequences of these occupational illnesses can be a reduction in performance, but can also lead to the person giving up their job. For example, 9–68% of professional musicians have occupational health impairments in the form of musculoskeletal complaint [6,7], and $\geq 60\%$ of musicians have recurrent pain in the shoulders, neck or hands [8]. The 12-month prevalence of musculoskeletal complaints in professional musicians ranged 41–93% [7].

Not all of the stress factors described above apply to music educators, so the stress situation of orchestral musicians is not necessarily identical to that of music educators. However, a large number of the stress factors and requirements described above also applies to music educators [9]. In contrast to music educators, teachers at general education schools are more frequently the focus of scientific studies with regard to psychological stress and strain [10,11]. Various stress factors in the teaching profession have already been identified: preparation and postprocessing of lessons, correction work and vocal stress [12]. Furthermore, dealing with difficult students, conflicts with colleagues, the increasing administrative workload and the lack of social recognition are among the most stressful job factors [13].

Teachers in general education schools also frequently complain of musculoskeletal complaints, with a prevalence of 42% [14]. Pain in the back, neck, and upper extremities is more frequently reported [15]. Noise pollution is also a problem in this occupational group, as 80%

of teachers surveyed feel stressed by the noise of the students [16,17]. The abovementioned demands and stresses result not only in physical stress but also in psychological stress. These in particular are responsible for a large proportion of the days of incapacity to work among teachers at general schools. Thus, 9% of cases of incapacity to work among teachers are caused by psychological complaints and thus account for 21% of the total number of sick days of other insured persons of a large German health insurance company. [12].

There are various models and concepts for explaining the interrelationships between stress and the consequences of stress, especially with regard to mental health: the concepts of work, stress and strain [18,19], the integrated concepts of work, stress and strain [20], the concept of salutogenesis [21], the transactional model of stress [22], the job-demand-control-support model [23], the job demands-resources model [24], and the effort-reward imbalance model [25]. Many of these explain the development of health impairments as a result of psychosocial stress. A detailed description is not provided here. However, it can be generalized that stresses can have different positive or negative consequences depending on personal characteristics and individual resources as well as on the support received by an individual. These intra- and interindividual differences in the available resources can thus have effects on the organism and, in the case of a long-lasting lack of compensation for negative stresses, can lead to serious changes in the organism and to the development of diseases.

An important role in the development and expression of stress consequences is work-related behavior and experience patterns, which are personal resources. One way of identifying this resource is the *Work-Related Behavior and Experience Pattern (Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM)* questionnaire. This questionnaire represents a multidimensional, factor-analytical, personality-diagnostic procedure that

captures different behavior patterns [26]. It is primarily used for the early detection of occupational health risks and allows for the development of preventive measures that form a basis for person-related interventions such as coaching, counseling, and supervision [26]. The focus of the questions in this questionnaire is on 3 content areas: work engagement, psychological resilience, and work-related emotions. In comparison to many other questionnaires, the AVEM method was developed on the basis of Friedman and Rosenman's [27] type A behavioral concept. The personal way of coping with occupational stressors was made the decisive criterion for health-related statements. Regarding a meta-analysis, the association between type A behavior (such as hostility) and heart diseases has been proven in many studies [28]. The AVEM not only looks at characteristics of work commitment, but also at issues such as the psychological resilience that is brought to bear in coping with demands and the emotions that accompany this confrontation [26]. Schaarschmidt and Fischer [26] differentiate between high levels of professional effort against a background of higher resilience (results that can be experienced as successes) or whether excessive commitment is shown at work with low resilience resources (failures despite increased effort) [26]. The AVEM is used to ask about attitudes and mindsets, experienced competencies and feelings, i.e., the active co-creative role of the employee in their relationship to the job requirements is emphasized: their individual behaviors and experiences, the use of personal resources, etc. One advantage of AVEM is that it enables more effective early diagnosis by identifying resources. Advising the employee based on the AVEM results allows the targeted use and promotion of development opportunities [26]. This approach promises a possible preventive approach, as warning signals in the patterns of work-related behavior and experience can be discussed in order to identify possible risks and take appropriate early intervention measures.

Changeability of the characteristics of a work-related pattern and shifts in membership to other AVEM patterns over time are possible, which enables effective measurement after interventions have taken place [26].

A Norwegian study of professional musicians showed that work-related factors (e.g., job demands, social support) and personal factors (such as neuroticism and sense of mastery) are associated with symptoms of anxiety and depression [29].

Depending on the characteristics of the individual 11 AVEM dimensions (described in the methodology), health-promoting or health-damaging patterns can be identified, which evaluate the interaction of the behavioral dimensions [26]. Proportion of AVEM risk patterns (also requiring intervention in any case) differed between different occupational groups, e.g., 65% university lecturers [30], 40% physicians in hospital setting [31], 43% in physicians in private practice [32], 69% medical students [33], and psychotherapy trainees [34].

The goal is the purposeful employment of the ranges in agreement with personal emphasis. For example, the ability to distance oneself can be a dimension of work engagement or resilience. Depending on the characteristics of the individual dimensions (*cf.* chapter Methodology), it is generally possible to identify patterns that are beneficial or detrimental to health that weigh the interaction of the behavioral dimension [26].

In the majority of the above listed studies, there were also low age correlations. It cannot be concluded from this that no health-relevant changes occur with increasing age [26]. However, studies show that older people, e.g., have more positive emotions than young adults [35]. The work commitment or overcommitment dimension also changes with age [36].

Little is known about the prevalence of work-related behavior and experience patterns among music educators depending on age. Only isolated literature sources

exist on study-related behavioral and experiential patterns among music students [37,38].

Therefore, the aim of this work was to determine the prevalence of health-promoting and harming AVEM patterns as well as the expression of AVEM dimensions in the music school setting. Hypothetically, it was assumed that there would be age-related differences in the work-related behavior pattern in this regard. Based on the study results, intervention suggestions for vocational educators are made.

MATERIAL AND METHODS

The nationwide study of music educators was conducted as an online survey. Participation was voluntary; written consent was provided. The planning and implementation of the study took place in August 2016 – February 2018. One subproject of this study considered questions about work-related behavior in this professional group. The study complies with the ethical principles of the World Medical Association Declaration of Helsinki. The research project was presented to the Ethics Committee of Otto von Guericke University Magdeburg, Germany, in advance. The positive vote is available under the No. 125/16.

Subjects

The total sample included 205 subjects who worked as music educators at various music schools in Germany. The subjects were divided into 3 age groups (AG I: ≤ 35 years, AG II: 36–45 years, AG III: ≥ 46 years). The subjects were recruited via flyers displayed in the music school, cover letters sent to music school directors in the Saxony-Anhalt area, and an informational e-mail including the link to the online survey sent to the state associations of music schools throughout Germany. All study participants received the information sheet on the implementation of the study in advance of the survey.

The inclusion criterion was subjects working as music educators in the music schools and conservatories for at least 1 year. The exclusion criterion was subjects working in a music school in the context of another professional group (technical or administrative staff). As a result, 2 subjects were excluded from the study in advance of the evaluation.

Methodology

The *Basic Questionnaire* consisted of questions for the collection of sociodemographic and occupational data as well as with activity-related questions, especially for this occupational group.

In addition, the subjects were presented with the standardized AVEM questionnaire according to Schaarschmidt and Fischer [26]. The evaluation was carried out with the help of the psychodiagnostic Vienna Test System (Schuhfried, Mödling, Austria).

The AVEM questionnaire is a diagnostic tool for mapping occupational behavior and experience patterns. The procedure is based on concepts that assume that a person's mental health depends decisively on how he or she deals with stressful situations. In this context, particular reference was made to resource theory [39], the concept of coherence experience [21] and the transactional model of stress and coping [22].

The test includes 66 questions in 11 dimensions, each of which comprises 6 items. The questions are answered on a 5-point scale from "strongly disagree" to "strongly agree." The dimensions can be categorized into 3 secondary factors (A–C):

- factor A: engagement with work – subjective importance of work (AVEM-1), work-related ambition (AVEM-2), willingness to work until exhausted (AVEM-3), striving for perfection (AVEM-4), and distancing ability (AVEM-5);
- factor B: emotional resilience – distancing ability (AVEM-5), tendency to resignation in the face of failure (AVEM-6), proactive problem-solving (AVEM-7), and inner calm and balance (AVEM-8);

- factor C: work-related emotions – experience of success at work (AVEM-9), satisfaction with life (AVEM-10), and experience of social support (AVEM-11).

Distancing ability represented in both work engagement and resilience. Depending on how it is viewed, it can be a stress factor as well as a resource. The results are presented here in the form of stanine values.

According to the characteristics of the individual dimensions, percentage probabilities of membership are then determined for the 4 basic patterns (A, B, G and S) (Figure 1). This results in 2 health-promoting AVEM patterns (G and S) as well as 2 health-endangering AVEM patterns (A and B). Based on these probabilities, the respondents are either assigned to a fully pronounced pattern (>95%) (applies to 23% of the German population according to Schaarschmidt and Fischer) or, in the most common case, various mixed patterns [26] as follows:

- accentuated pattern (pattern membership >80% and ≤95%),
- pattern tendency (pattern membership >60% and ≤80%, no second pattern >30%),
- a combination of patterns (2 predominant patterns, both >80%, weaker pattern >30%).

For approx. 5% of the reference sample of the German population, no assignment is possible [51]. This is considered the unclassifiable pattern. From this, in turn, recommendations can be derived for dealing with work-related stresses and strains, which should include both behavioral and situational prevention measures.

The execution time of the AVEM survey is approx. 10 min. For the evaluation, only subjects with the full, accentuated, or tendentious AVEM pattern expression were included. The subjects with the combination pattern and unassigned subjects were excluded from further evaluation.

Statistical methods

With an effect size of $\eta^2 = 0.14$ (corresponding to an f of around 0.403) and a power of 0.9, the study needed 27 sub-

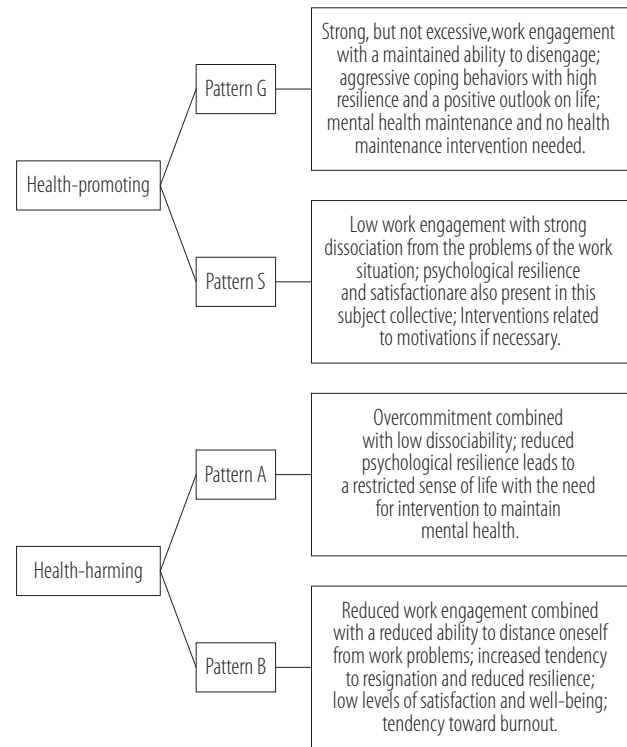


Figure 1. Characteristics of the individual *Work-Related Behavior and Experience Pattern (Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM)* patterns

jects per group (81 in total) to obtain a significant result with a 1-factor ANOVA ($\alpha = 0.05$).

The raw data from the 205 subjects studied were entered into the SPSS Statistics 24.0 program (IBM, Armonk, NY, USA) for statistical analysis. Before performing comparisons of mean differences among the 3 age groups, the variables were first tested for normal distributions using Kolmogorov-Smirnov tests or Shapiro-Wilk tests. Subsequently, parametric tests (t test for $k > 2$ unconnected samples, ANOVA) were used for normally distributed variables, and nonparametric tests for $k > 2$ unconnected samples (the Kruskal-Wallis test as well as post hoc Bonferroni correction) were used for nonnormally distributed variables or normally distributed ordinal scaled variables. To check the expression of the AVEM dimensions for any existing correlations with age and years of occupation, correlation analyses were performed according to Spear-

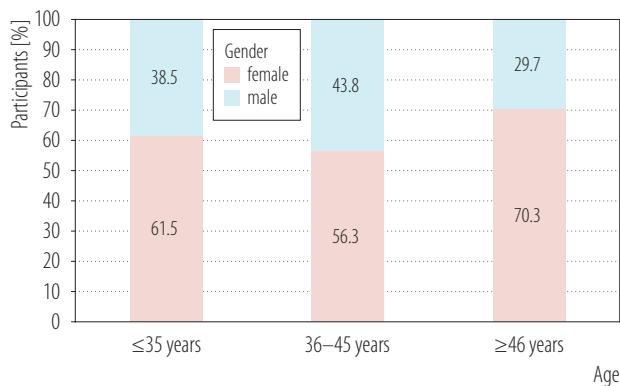
man's scale level. Spearman's correlation coefficients (r) were interpreted according to Akoglu [40]: <0.39 indicated a small effect, $0.40\text{--}0.59$ – a moderate effect, and >0.6 – a strong effect. The significance level was set at an error probability of 5%. Finally, a test of between-subjects effects in the general linear model was conducted. Years in the teaching profession, length of service, weekly working hours and age group were selected as constant dates. According to Cohen [41], the interpretation of partial eta square was: $\eta^2 <0.06$ (mild effect), $\eta^2 = 0.06\text{--}0.14$ (moderate effect), and $\eta^2 >0.14$ (high effect).

RESULTS

Sociodemographic and occupational data

Of 205 study participants, 27 (12.8%) were in the ≤ 35 years old group, 32 (15.8%) were in the 36–45 years old group, and 146 (71.4%) were in the ≥ 46 years old group. In the total sample, 69 (33.7%) subjects were male, and 136 (66.3%) were female. The gender distribution in the 3 age groups (Figure 2) showed no significant differences ($p_{\chi^2} = 0.261$).

The music educators worked in various professional fields, including classical work in a municipal or private music school and freelance work or part-time jobs. Their field of activity was, for the most part, instrumental les-



Pearson's $\chi^2 = 0.261$.

Figure 2. Gender distribution in age groups of professional music educators, Magdeburg, Germany, August 2016 – February 2018

sons (individual and group lessons) or in the context of early musical education in the music schools themselves, kindergartens and/or elementary schools with which the music schools had a cooperation agreement. A total of 172 (84.7%) subjects worked in permanent positions, and 46 (23.0%) worked as freelancers. Among the subjects, some were active both in permanent employment and on a fee basis. The total duration of activity in the field of music education was $M \pm SD$ 22.8 ± 10.7 years.

The respondents taught various subjects in different forms of instruction. The most frequently represented subjects were elementary music education (22.9%), brass instruments (22.4%), and plucked and woodwind instruments (21% each). Thirty-four percent of music educators taught ≥ 2 subjects.

Individual instruction was the most common form of instruction, with 91.7% of the respondents teaching students in this manner. However, partner and group instruction were also frequently performed, with 65.9% of educators teaching in each of these modes.

Work-related behavior and experience pattern

Of the 205 music educators studied, 202 were able to complete the AVEM questionnaire and completely answered the questions.

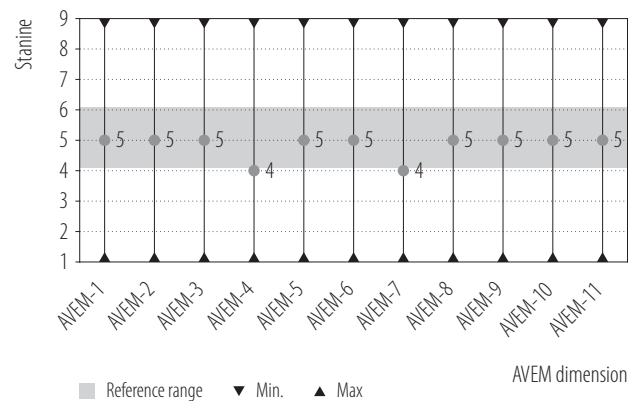
The mean and median values of the 11 dimensions (as stanine values) were within the normal range for each individual dimension (Figure 3). For reasons of clarity, only the median is reported here. The median values of the striving for perfection and proactive problem solving dimensions were just within the reference range, at their lower limit. On the basis of the minima and maxima, however, it became apparent that some subjects had values that were clearly outside the normal range (4–6). The most pronounced dimension, with a value of $M \pm SD$ 5.2 ± 2.15 , was the willingness to work until exhausted. The least pronounced dimension, with $M \pm SD$ 4.36 ± 1.77 , was proactive problem solving.

Mean comparisons revealed significant differences in the age groups I and III ($p = 0.018$) and II and III ($p = 0.001$) only for the AVEM dimension “work-related ambition”; otherwise, the other 10 dimensions did not differ significantly among the 3 age groups (Table 1).

The frequencies of the expression of the individual AVEM dimensions (below, within or above the normal range) in the 3 age groups are shown in Table 2. The expression of the dimensions of many subjects lie outside the normal range, which could not be adequately represented by the mean and median. No significant differences were found between the distributions of the dimension expressions in the 3 age groups ($p = 0.108\text{--}0.911$).

Considering the total sample ($N = 202$), a fully pronounced, accentuated, or tendential pattern was evident in 156 subjects (subsample). The age-differentiated distribution of the 4 AVEM patterns of this subsample is shown in Table 3. The combination of 2 patterns occurred in 41 subjects. No assignment to 1 of the 4 AVEM patterns was recorded in 6 subjects. There was no significant difference between the fully pronounced, accentuated, or tendential patterns (this approach was taken in the following) in the number of professional years ($p = 0.317$), although the subjects with the risk patterns tended to have a higher number of professional years. A significant difference in the assignment to the 4 patterns (fully pronounced, accentuated, or tendential pattern) among the 3 age groups (≤ 35 years, $36\text{--}45$ years and ≥ 46 years) was also not found ($p = 0.669$).

How the expression of the AVEM dimensions in the individual patterns (here in the subsample, i.e., the fully pronounced, accentuated, or tendential patterns) differed among the age groups is shown in Figures 4a and 4b. For all music educators with pattern G, the difference in the “experience of success at work” dimension between the groups aged ≤ 35 years and ≥ 46 years ($p_{\text{Bonferroni}} = 0.006$) was significant. All music educators belonging to pat-



AVEM-1 – subjective importance of work; AVEM-2 – work-related ambition; AVEM-3 – willingness to work until exhausted; AVEM-4 – striving for perfection; AVEM-5 – distancing ability; AVEM-6 – tendency to resignation in the face of failure; AVEM-7 – proactive problem-solving; AVEM-8 – inner calm and balance; AVEM-9 – experience of success at work; AVEM-10 – satisfaction with life; AVEM-11 – experience of social support.

Figure 3. Results from the *Work-Related Behavior and Experience Pattern* (German for *Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM*) questionnaire of professional music educators, Magdeburg, Germany, August 2016 – February 2018

tern B differed with respect to age group in the “proactive problem-solving dimension” ($p_{\text{Kruskal-Wallis}} = 0.048$ without further significance in the Bonferroni correction). The other 2 AVEM groups, patterns S and A, did not differ regarding age.

Correlations and variance calculations

There were only a few weak correlations between the AVEM dimensions and sociodemographic and occupational data in the correlation analysis (Table 4). For example, age had a negative correlation with the experience of social support ($\rho = -0.354$). The number of years teaching ($\rho = -0.266$) showed a negative correlation with professional ambition. The total number of years in the profession had a positive correlation with the experience of success at work ($\rho = 0.366$), and the number of hours per week had a positive correlation with the willingness to work until exhausted ($\rho = 0.187$) and a negative correlation with distancing ability ($\rho = -0.219$).

Table 1. Mean comparisons of *Work-Related Behavior and Experience Pattern (Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM)* dimensions within the 3 age groups of professional music educators, Magdeburg, Germany, August 2016 – February 2018

AVEM dimension	Participants' score												P _{Kruskal-Wallis}	post hoc P _{Bonferroni}
	age group I (N = 26)			age group II (N = 32)			age group III (N = 144)			P _{Kruskal-Wallis}	post hoc P _{Bonferroni}			
	M±SD	Me (min.–max)	95% CI	M±SD	Me (min.–max)	95% CI	M±SD	Me (min.–max)	95% CI					
Subjective importance of work	5.04±1.49	5 (2–7)	4.41–5.67	5.00±2.02	5 (2–9)	4.22–5.78	5.12±2.00	5 (1–9)	4.77–5.47	0.524				
Work-related ambition	5.96±2.05	6 (1–9)	5.09–6.83	5.54±2.13	6 (1–9)	4.71–6.36	4.52±1.91	4 (1–8)	4.19–4.89	0.003	II vs. III 0.018 I vs. III 0.001			
Willingness to work until exhausted	4.71±1.73	5 (1–9)	3.98–5.44	5.61±2.17	5 (1–9)	4.77–6.45	5.10±2.18	5 (1–9)	4.71–5.48	0.382				
Striving for perfection	4.50±1.45	4 (2–7)	3.89–5.11	4.82±2.50	5 (1–9)	3.85–5.79	4.25±2.11	4 (1–9)	3.88–4.63	0.170				
Distancing ability	5.21±1.64	5 (3–8)	4.52–5.90	4.71±2.46	4 (1–8)	3.80–5.63	5.05±1.92	5 (1–9)	4.71–5.39	0.856				
Tendency to resignation in the face of failure	4.96±1.97	5 (1–8)	4.13–5.79	4.57±2.25	4 (1–9)	3.70–5.44	4.93±2.05	5 (1–9)	4.57–5.29	0.610				
Proactive problem-solving	4.38±1.53	4 (1–8)	3.73–5.02	4.68±1.49	5 (2–8)	4.10–5.26	4.32±1.85	4 (1–9)	3.99–4.64	0.378				
Inner calm and balance	4.96±1.71	5 (3–9)	4.24–5.68	5.04±2.08	5 (1–9)	4.23–5.84	5.12±1.77	5 (1–9)	4.81–5.43	0.893				
Experience of success at work	4.58±2.10	5 (1–8)	3.69–5.47	4.79±2.33	5 (1–9)	3.88–5.69	4.94±2.25	5 (1–9)	4.55–5.34	0.896				
Satisfaction with life	4.96±1.76	5 (1–9)	4.22–5.70	4.64±2.23	5 (1–9)	3.78–5.51	4.97±2.31	5 (1–9)	4.56–4.37	0.723				
Experience of social support	5.38±2.16	6 (1–9)	4.46–6.29	5.43±2.67	6 (1–9)	4.59–6.27	5.36±4.48	5 (1–9)	4.57–6.15	0.322				

Age group I: 18–35 years; age group II: 36–45 years; age group III: ≥46 years.

Bolded are statistically significant values.

Table 2. Expression of the *Work-Related Behavior and Experience Pattern (Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM)* dimensions in the 3 age groups of professional music educators, Magdeburg, Germany, August 2016 – February 2018

Dimension in age groups	Participants (N = 202) [n (%)]		
	below the normal range	within normal range	above the normal range
Subjective importance of work			
≤35 years	7 (26.9)	15 (57.7)	4 (15.4)
36–45 years	9 (28.1)	14 (43.8)	9 (28.1)
≥46 years	33 (22.9)	73 (50.7)	38 (26.4)
Work-related ambition			
≤35 years	5 (19.2)	12 (46.2)	9 (34.6)
36–45 years	5 (15.6)	17 (53.1)	10 (31.3)
≥46 years	41 (28.5)	79 (54.9)	24 (16.7)
Willingness to work until exhausted			
≤35 years	6 (23.1)	16 (61.5)	4 (15.4)
36–45 years	4 (12.5)	15 (46.9)	13 (40.6)
≥46 years	38 (26.4)	64 (44.4)	42 (29.2)
Striving for perfection			
≤35 years	6 (23.1)	16 (61.5)	4 (15.4)
36–45 years	10 (31.3)	15 (46.9)	7 (21.9)
≥46 years	59 (41.0)	65 (45.1)	20 (13.9)
Distancing ability			
≤35 years	5 (19.2)	14 (53.8)	7 (26.9)
36–45 years	11 (34.4)	11 (34.4)	10 (31.3)
≥46 years	28 (19.4)	79 (54.9)	37 (25.7)
Tendency to resignation in the face of failure			
≤35 years	5 (19.2)	15 (57.7)	6 (23.1)
36–45 years	9 (28.1)	17 (53.1)	6 (18.8)
≥46 years	31 (21.5)	76 (52.8)	37 (25.7)
Proactive problem solving			
≤35 years	7 (26.9)	15 (57.7)	4 (15.4)
36–45 years	9 (28.1)	20 (62.5)	3 (9.4)
≥46 years	47 (32.6)	80 (55.6)	17 (11.8)
Inner calm and balance			
≤35 years	8 (30.8)	14 (53.8)	4 (15.4)
36–45 years	8 (25.0)	18 (56.3)	6 (18.8)
≥46 years	25 (17.4)	94 (65.3)	25 (17.4)

Table 2. Expression of the *Work-Related Behavior and Experience Pattern (Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM)* dimensions in the 3 age groups of professional music educators, Magdeburg, Germany, August 2016 – February 2018 – cont.

Dimension in age groups	Participants (N = 202) [n (%)]		
	below the normal range	within normal range	above the normal range
Experience of success at work			
≤35 years	8 (30.8)	14 (53.8)	4 (15.4)
36–45 years	8 (25.0)	18 (56.3)	6 (18.8)
≥46 years	44 (30.6)	68 (47.2)	32 (22.2)
Satisfaction of life			
≤35 years	4 (15.4)	18 (69.2)	4 (15.4)
36–45 years	9 (28.1)	16 (50.0)	7 (21.9)
≥46 years	36 (25.0)	69 (47.9)	39 (27.1)
Experience of social support			
≤35 years	5 (19.2)	10 (38.5)	11 (42.3)
36–45 years	9 (28.1)	15 (46.9)	8 (25.0)
≥46 years	32 (22.2)	77 (53.5)	35 (24.3)

Pearson’s χ^2 without significance.

Below the normal range: 1–3 pts, within normal range: 4–6 pts, above the normal range: 7–9 pts.

Table 3. Distribution of *Work-Related Behavior and Experience Pattern (Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM)* patterns (fully pronounced, accentuated, or tendential pattern) in the 3 age groups of professional music educators, Magdeburg, Germany, August 2016 – February 2018

Age group	Participants (N = 156) [n (%)]			
	pattern G	pattern S	risk pattern A	risk pattern B
≤35 years	3 (15)	4 (20)	7 (35)	6 (30)
36–45 years	8 (32)	4 (16)	5 (20)	8 (32)
≥46 years	25 (22.5)	30 (27)	25 (22.5)	31 (28)

No statistical significance of the distribution of AVEM groups in the 3 age groups ($p_{\text{exact Fisher}} = 0.669$).

Risk pattern – health-harming AVEM pattern.

For pattern A, B, G, S explanation see Figure 1.

Test of inter-subjects effects in the general linear model

The influence of various factors on dependent variables was controlled and is shown in the Table 5. In the corrected model, only work-related ambition remains statistically significant between the groups ($p = 0.036$)

with a moderate effect $\eta^2 = 0.093$. Practice years of teaching, work experience, and age group have no effect in the model. Working hours per week have a mild effect on the AVEM dimensions “willingness to work until exhausted” ($\eta^2 = 0.034$) and “distancing ability” ($\eta^2 = 0.058$).

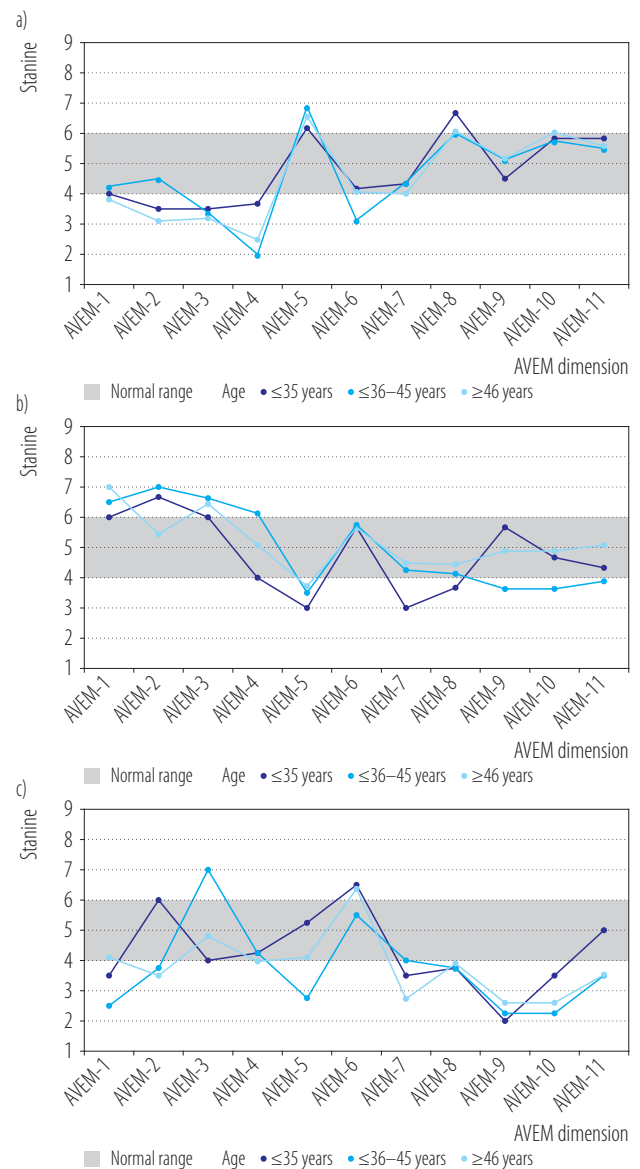
DISCUSSION

The study addressed the work-related behavioral and experiential patterns of 205 music educators, which was the basis for proposing workplace interventions to promote mental health in the workplace.

In the analysis of the sociodemographic data, it was striking that the majority of the subjects (71.4%) belonged to AG III (≥ 46 years old). Data from the Federal Employment Agency as well as the Künstlersozialkasse indicate that in 2021 (cutoff date June 30, 2021), approx. 47 600 music educators were employed in Germany [42]. According to the Federal Employment Agency, the composition was different: 54.4% of the employees in this occupational group were assigned to the group aged 25 to <55 years, and 41.2% of employees were assigned to the group aged ≥ 55 years. Thus, the sample examined here can be considered representative.

In addition, a significantly higher proportion of female music educators was observed (66.3%). However, this distribution was not significantly different in all 3 age groups. Therefore, another comparison with the data of the German Federal Employment Agency [43] was made. Here, as described for music educators in Germany who are subject to social insurance contributions, 44% of employees were male and 56% were female. In 2021, among those insured in the Künstlersozialkasse, 52% of freelance music educators were female and 48% were male. Accordingly, there was a higher proportion of female subjects in the study collective compared to the total number of music educators working in Germany. This also corresponds, e.g., to the observations of Darius et al. [12] in the professional group of teachers. The proportion of female students in the field of music education in the independent profession or at music schools was slightly higher at 59% [44].

The focus was on age group differentiation, which, however, did not show any significant differences in the distribution of normal and expressions outside



AVEM-1 – subjective importance of work; AVEM-2 – work-related ambition; AVEM-3 – willingness to work until exhausted; AVEM-4 – striving for perfection; AVEM-5 – distancing ability; AVEM-6 – tendency to resignation in the face of failure; AVEM-7 – proactive problem-solving; AVEM-8 – inner calm and balance; AVEM-9 – experience of success at work; AVEM-10 – satisfaction with life; AVEM-11 – experience of social support.

Pattern G is not shown because there were only 3 subjects who can be assigned to the sample.

Figure 4. Expression of Work-Related Behavior and Experience Pattern (*Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM*) dimensions for subjects of a) pattern S, b) pattern A, c) pattern B in the 3 age groups among professional music educators, Magdeburg, Germany, August 2016 – February 2018

Table 4. Spearman- ρ correlations between the job-related data and the *Work-Related Behavior and Experience Pattern (Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM)* dimensions in professional music educators, Magdeburg, Germany, August 2016 – February 2018

AVEM dimension	Spearman's correlation							
	age		practice years teaching		work experience		hours per week	
	ρ	p	ρ	p	ρ	p	ρ	p
Subjective importance of work	0.268	n.s.	-0.040	n.s.	0.309	n.s.	0.118	n.s.
Work-related ambition	-0.053	n.s.	-0.266	<0.001	0.148	n.s.	0.054	n.s.
Willingness to work until exhausted	-0.030	n.s.	-0.0016	n.s.	-0.075	n.s.	0.187	0.022
Striving for perfection	0.007	n.s.	-0.031	n.s.	-0.150	n.s.	0.139	n.s.
Distancing ability	0.063	n.s.	0.019	n.s.	0.111	n.s.	-0.219	0.007
Tendency to resignation in the face of failure	0.132	n.s.	0.015	n.s.	-0.295	n.s.	-0.062	n.s.
Proactive problem-solving	0.048	n.s.	-0.132	n.s.	0.186	n.s.	0.062	n.s.
Inner calm and balance	-0.007	n.s.	0.020	n.s.	0.068	n.s.	-0.004	n.s.
Experience of success at work	-0.071	n.s.	-0.005	n.s.	0.366	0.024	0.140	n.s.
Satisfaction with life	-0.041	n.s.	-0.115	n.s.	0.200	n.s.	0.200	n.s.
Experience of social support	-0.354	0.034	-0.156	n.s.	0.041	n.s.	0.047	n.s.

n.s. – not significant.

ρ – two-sided p.

ρ : <0.39 – low effect, 0.40–0.59 – moderate effect, >0.6 – strong effect.

Table 5. *Work-Related Behavior and Experience Pattern (Arbeitsbezogenes Verhaltens- und Erlebensmuster – AVEM)* dimensions in group comparison considering the covariates among professional music educators, Magdeburg, Germany, August 2016 – February 2018

AVEM dimension	General linear model test of inter-subject effects										
	corrected model			practice years of teaching		work experience		working hours per week		age group	
	R ²	p	η^2	p	η^2	p	η^2	p	η^2	p	η^2
Subjective importance of work	-0.019	0.759	0.021	0.883	0.000	0.905	0.000	0.113	0.021	0.969	0.001
Work-related ambition	0.056	0.036	0.093	0.327	0.008	0.988	0.000	0.254	0.011	0.385	0.016
Willingness to work until exhausted	0.024	0.160	0.063	0.514	0.004	0.343	0.008	0.042	0.034	0.329	0.018
Striving for perfection	0.005	0.355	0.044	0.319	0.008	0.239	0.012	0.118	0.020	0.565	0.009
Distancing ability	0.028	0.135	0.067	0.868	0.000	0.965	0.000	0.008	0.058	0.671	0.007
Tendency to resignation in the face of failure	-0.034	0.973	0.007	0.744	0.001	0.796	0.001	0.995	0.000	0.781	0.004
Proactive problem-solving	-0.008	0.544	0.033	0.527	0.003	0.096	0.023	0.785	0.001	0.599	0.009
Inner calm and balance	-0.039	0.997	0.003	0.748	0.001	0.926	0.000	0.943	0.000	0.966	0.001
Experience of success at work	-0.032	0.954	0.009	0.949	0.000	0.913	0.000	0.561	0.003	0.766	0.004
Satisfaction with life	0.000	0.427	0.040	0.245	0.011	0.900	0.000	0.198	0.014	0.272	0.021
Experience of social support	-0.019	0.750	0.022	0.244	0.013	0.677	0.002	0.604	0.002	0.924	0.001

η^2 : <0.06 – mild effect, 0.06–0.14 – moderate effect, >0.14 – high effect.

Bolded are statistically significant values.

the normal range of the AVEM dimensions. Mean comparisons revealed age group differences for “occupational ambition,” with this being lowest in the oldest group, AG III (≥ 46 years). The prevalence of health-harming AVEM patterns decreased with increasing age. Thus, 65% of subjects with the AVEM risk patterns A and B were still present in the youngest group, AG I (≤ 35 years), and 50.5% were included in AG III, but without statistical certainty. A general linear model also showed no effects regarding age groups. In contrast, a strong effect of age on work-related ambition was found among German prehospital emergency service personnel [45].

The majority of music educators showed average expressions of the AVEM dimensions. Additionally, a correlation analysis showed only a weak negative correlation between age and “experiencing social support.” Thus, the hypothesis formulated at the beginning of the study cannot be confirmed: age has hardly any influence on work-related behavior and experience patterns.

For individuals with risk pattern A, their behavior can be briefly described as follows: high effort does not have a positive emotional counterpart (lower satisfaction with life and lower experience of social support). This risk pattern partially contradicts the model of gratification crisis (effort-reward imbalance model) [25]. Its characteristic is the combination of high work input and constant efforts at the workplace (effort) and a lack of experience of recognition or reward (reward). This constellation is expected to result in a higher cardiovascular risk. Individuals with risk pattern B have lower expressions of the subjective importance of work and work-related ambition dimensions, i.e., all belonging to secondary factor A “engagement with work.” In summary, this behavioral pattern can be associated with negative emotions, determined by resignation, exhaustion experience, reduced resilience, and dissatisfaction [26], and thus

associated with burnout syndrome (*cf.* dimensions of burnout syndrome) [46,47].

In a study of college faculty, contrary to the authors’ findings, AVEM risk patterns A and B were found to increase with age across 4 age groups [30].

Looking at other studies, the frequency of occurrence of AVEM risk patterns A and B of approx. 55% among the teachers was high compared to that among other professionals. In this regard, 42% of the included teachers [48], 34% of police officers [31], 38% of correctional officers [31], 47% of psychotherapists [34], 41% of inpatient nursing staff [49] and 34% of employees of international financial service providers [50] showed a significantly lower frequency of AVEM risk patterns A or B. Two occupational groups showed higher expressions of AVEM risk patterns: 69% of medical students [33] and 65% of university teachers [30]. It should be noted that some of these studies used the 44-item short form. However, this is negligible because the intercorrelations of the corresponding scales of the standard (the 66-item long form) and short forms ranged 0.95–0.97 [51].

In the study by Thielmann et al., age-differentiated expressions of the “subjective importance of work in personal life” and “tendency to resign in the face of failure” dimensions were found among university lecturers [30]. Both AVEM dimensions were most pronounced in the oldest group.

It is significant to initiate appropriate intervention measures in the company setting. Predominant characteristics of individuals with risk pattern A are a high level of work engagement combined with low stress resistance and rather negative emotions. The AVEM pattern A is considered to pose a risk to health in the case of insufficient compensation for high levels of work engagement [26]. For risk pattern B, the focus is on feelings of overwork, exhaustion, and resignation, which may be relevant as symptoms in the development of burnout [26]. Compared to teachers at general education schools, among

music educators, the prevalence of burnout symptoms up and manifested burnout risk was slightly higher [52]. A high risk of burnout was present in 4 (12.5%) middle-aged music educators and in 13 (9.4%) older music educators, with no age group difference.

The high occurrence of risk patterns in the professional group of music educators should be investigated in connection with other characteristics important for mental health in further research. Another study showed not only a negative relationship between job satisfaction and AVEM risk pattern B but also between AVEM pattern S and job satisfaction [53]. For individuals with health-promoting AVEM pattern S, interventions based on increasing motivation are also needed [26]. This does not mean that individuals with these patterns are lazy, rather than “sparing” is a protective function against work stresses [26].

Recommended measures for workplace prevention and health promotion based on the AVEM models

Schaarschmidt and Fischer recommend specific and cross-cutting measures of interventions. Cross-cutting measures are useful in the commonalities of the AVEM risk patterns A and B [26].

To strengthen inner calm and balance the limited distancing ability, the following are recommended: stress compensation by relaxing and compensating by establishing a break management system, rebounding or balancing through other physical activities such as sports, cycling, gardening, walking, etc., relaxation training (autogenic training, progressive muscle relaxation, breathing exercises, yoga, meditation, etc.), and individual stress management.

To improve the limited feeling of life or general satisfaction, it is recommended to improve well-being, create satisfactory experiences (in private and professional environments) and use methods of positive psychology.

To reduce the experience of failure or the tendency to resign in the case of mistakes or discrepancies in goals, the following can be helpful: Realistic definitions of work assignments, problematization and changing unrealistic, exaggerated (pattern A) or disappointing (pattern B) job-related demands, expectations and goals. For example, when preparing students for a competition (music competition), decisions should be made together with the student and parents as to whether the intended goals could be achieved within normal working hours in order to avoid overtime.

Increased and better warning of social support work development or strengthening team spirit and teamwork (e.g., implementation of regular employee appraisals by the head of music school), creating a positive working climate, and organizing and maintaining social contacts in leisure time.

As work-related ambition is significantly less pronounced in older people than in other age groups, interventions are recommended with regard to motivation. This gives the impression that the professional ambition of older music teachers declines with age and presumably with the desired position and standard of living.

Depending on the characteristics, specific measures can also be taken for the risk patterns A or B. For the pattern S, measures to increase motivation are recommended. Motivating factors for all occupations can include challenging work tasks, functioning social relationships at work, and effective coping support systems [26].

Strengths and limitations of the work

The strength of the work lies in the survey of work-related, behavior-experience patterns in the music school setting. In this professional group of music educators, the prevalence of risky behavior in the context of mental health is not yet known. These data are important to better interpret previous knowledge of burnout prevalence, physical

and psychological complaints, and job satisfaction among music educators [9,52].

The online survey was completed by 205 music educators. This sample size is rather low compared to the number of music educators working in Germany (47 600 in 2021) [42]. In addition, a certain selection of stressed and nonstressed music educators seems possible since they may be more aware of offers such as the survey conducted in this study than their less stressed colleagues. As is usual with questionnaires, responses in terms of social desirability or social norms cannot be excluded. Accordingly, the answers to the questions are also very subjective. An age-related drop-out should also be considered, according to which people with health impairments leave the workforce earlier than others.

CONCLUSIONS

There is a high proportion of individuals with AVEM risk patterns in need of intervention, which are associated with self-overload (A) and resignation (B) and can be accompanied by health disorders. This is especially the case when prolonged stresses are not adequately compensated because personal resources are not available (or are lacking). This need for intervention existed in all 3 age groups, with younger music educators showing a higher occurrence of risk patterns and unfavorable expressions of some dimensions associated with risk. A significant decline in the prevalence of subjective health rated as good or very good was observed from the age of 45 years [54]. Concepts for workplace health promotion require an age-appropriate organization of working life as well as participation- and communication-oriented generation management [55]. Therefore, it seems reasonable to promote appropriate stress management measures and resilience building at the undergraduate level. Ultimately, further research is needed to address health-related issues and evaluate AVEM pattern-specific interventions in the music school setting.

Author contributions

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REFERENCES

1. Böckelmann I, Schneyer B. Arbeitsbedingte Belastungen und Erkrankungen von Musikern. *ASU Arbmed Sozialmed Umweltmed.* 2009;44:237–42. German.
2. Spahn C. Psychosomatische und psychische Erkrankungen bei Musikern. *Nervenheilkunde.* 2018;37:398–408. <https://doi.org/10.1055/s-0038-1667396>. German.
3. Spahn C. Lampenfieber und Auftrittsangst. *Sprache Stimme Gehör.* 2019;43:33–7. <https://doi.org/10.1055/a-0790-5056>. German.
4. Möller H, Samsel W. Die Last des Perfektionismus. Wie das Streben nach Perfektionismus zum Scheitern führen kann. *Musikphysiologie und Musikermedizin.* 2015;3:93–9.
5. Spahn C, Richter B, Altenmüller E, editors. *MusikerMedizin: Diagnostik, Therapie und Prävention von musikerspezifischen Erkrankungen.* 1st ed. Stuttgart: Schattauer; 2012.
6. Rotter G, Noeres K, Fernholz I, Willich SN, Schmidt A, Berghöfer A. Musculoskeletal disorders and complaints in professional musicians: a systematic review of prevalence, risk factors, and clinical treatment effects. *Int Arch Occup Environ Health.* 2020;93:149–87. <https://doi.org/10.1007/s00420-019-01467-8>.
7. Kok LM, Huisstede BMA, Voorn VMA, Schoones JW, Nelligsen, Rob GHH. The occurrence of musculoskeletal complaints among professional musicians: a systematic review. *Int Arch Occup Environ Health.* 2016;89:373–96. <https://doi.org/10.1007/s00420-015-1090-6>.

8. Gasenzer ER, Klumpp M-J, Pieper D, Neugebauer EAM. The prevalence of chronic pain in orchestra musicians. *Ger Med Sci.* 2017;15:Doc01. <https://doi.org/10.3205/000242>.
9. Kirsch M, Kirsch F, Böckelmann I. Physische und psychische Beschwerden sowie arbeitsmedizinische Vorsorge bei Musikpädagog:innen verschiedener Altersgruppen. *Zbl Arbeitsmed.* 2023;73:222–9. <https://doi.org/10.1007/s40664-023-00504-1>. German.
10. Scheuch K, Haufe E, Seibt R. Teachers' Health. *Dtsch Arztebl Int.* 2015;112:347–56. <https://doi.org/10.3238/arztebl.2015.0347>.
11. Borrelli I, Benevene P, Fiorilli C, D'Amelio F, Pozzi G. Working conditions and mental health in teachers: a preliminary study. *Occup Med (Lond).* 2014;64:530–2. <https://doi.org/10.1093/occmed/kqu108>.
12. Darius S, Seiboth F, Bunzel K, Seibt R, Böckelmann I. Belastungsfaktoren und Burnout-Risiko bei Lehrkräften unterschiedlichen Alters. *ASU Arbmed Sozialmed Umweltmed.* 2016;51:353–9. German.
13. van Dick R. Stress und Arbeitszufriedenheit im Lehrerberuf: Eine Analyse von Belastung und Beanspruchung im Kontext sozialpsychologischer, klinisch-psychologischer und organisationspsychologischer Konzepte: Tectum Verlag DE; 1999.
14. Seibt R, Lützkendorf L, Thinschmidt M. Risk factors and resources of work ability in teachers and office workers. *Int Congr Ser.* 2005;1280:310–5. <https://doi.org/10.1016/j.ics.2005.02.006>.
15. Erick PN, Smith DR. A systematic review of musculoskeletal disorders among school teachers. *BMC Musculoskelet Disord.* 2011;12:260. <https://doi.org/10.1186/1471-2474-12-260>.
16. Lamotte A-S, Essadek A, Shadili G, Perez J-M, Raft J. The Impact of Classroom Chatter Noise on Comprehension: A Systematic Review. *Percept Mot Skills.* 2021;128:1275–91. <https://doi.org/10.1177/00315125211005935>.
17. Schönwälder H-G, Berndt J, Ströver F, Tiesler G. Lärm in Bildungsstätten – Ursachen und Minderung. Dortmund/Berlin/Dresden: Wirtschaftsverlag NW; 2004.
18. Rohmert W. Ergonomics: concept of work, stress and strain. *Appl Psychol.* 1986;35:159–80. <https://doi.org/10.1111/j.1464-0597.1986.tb00911.x>.
19. Rohmert W, Rutenfranz J. Arbeitswissenschaftliche Beurteilung der Belastung und Beanspruchung an unterschiedlichen industriellen Arbeitsplätzen. Bonn: Der Bundesminister für Arbeit und Sozialordnung; 1975.
20. Scheuch K, Schröder H. Mensch unter Belastung: Stress ein humanwissenschaftliches Integrationskonzept. Berlin: Deutscher Verlag der Wissenschaften; 1990.
21. Antonovsky A. Unraveling the mystery of health: How people manage stress and stay well. San Francisco, CA, US: Jossey-Bass; 1987.
22. Lazarus RS, Folkman S. Transactional theory and research on emotions and coping. *Eur J Pers.* 1987;1:141–69. <https://doi.org/10.1002/per.2410010304>.
23. Karasek RA, Theorell T. Healthy work. In: Stress, productivity, and the reconstruction of working life. New York: Basic Books; 1990.
24. Demerouti E, Bakker AB, Nachreiner F, Schaufeli WB. The job demands-resources model of burnout. *J Appl Psychol.* 2001;86:499–512.
25. Siegrist J. Adverse health effects of high-effort/low-reward conditions. *J Occup Health Psychol.* 1996;27–41. <https://doi.org/10.1037/1076-8998.1.1.27>.
26. Schaarschmidt U, Fischer AW. Arbeitsbezogenes Verhaltens- und Erlebensmuster: AVEM (Standardform); AVEM-44 (Kurzform). Manual. 5th ed. Mödling, Germany: Schuhfried GmbH; 2020.
27. Friedman M, Rosenman RH. Der A-Typ und der B-Typ: 0047. 1st ed. Hamburg: Rowohlt; 1975.
28. Myrtek M. Meta-analyses of prospective studies on coronary heart disease, type A personality, and hostility. *Int J Cardiol.* 2001; 79:245–51. [https://doi.org/10.1016/s0167-5273\(01\)00441-7](https://doi.org/10.1016/s0167-5273(01)00441-7).
29. Aalberg AL, Saksvik-Lehouillier I, Vaag JR. Demands and resources associated with mental health among Norwegian professional musicians. *Work.* 2019;63:39–47. <https://doi.org/10.3233/WOR-192906>.

30. Thielmann B, Karlsen HR, Tymbova M, Kapustnyk V, Zavgorodnia N, Zavgorodnii I, Böckelmann I. Mental Health and Work-Related Behaviors in Management of Work Requirements of University Lecturers in Ukraine-An Age Group Comparison. *Int J Environ Res Public Health*. 2021. <https://doi.org/10.3390/ijerph182010573>.
31. Voltmer E, Kieschke U, Spahn C. Work-related behaviour and experience patterns of physicians compared to other professions. *Swiss Med Wkly*. 2007;137:448–53. <https://doi.org/10.4414/sm.w.2007.11834>.
32. Voltmer E, Spahn C, Frank E. Factors for and against establishing and working in private practice correlated with work-related behavior and experience patterns of German physicians in Schleswig-Holstein: A 2-year longitudinal study. *Int J Occup Med Environ Health*. 2017;30:485–98. <https://doi.org/10.13075/ijom.eh.1896.00775>.
33. Afshar K, Wiese B, Stiel S, Schneider N, Engel B. Perceived stress and study-related behavior and experience patterns of medical students: a cross-sectional study. *BMC Med Educ*. 2022;22:122. <https://doi.org/10.1186/s12909-022-03182-4>.
34. Grundmann J, Sude K, Löwe B, Wingenfeld K. Work-related behaviour and experience patterns and mental health: a study in psychotherapy trainees. *Psychother Psychosom Med Psychol*. 2013;63:145–9. <https://doi.org/10.1055/s-0032-1333292>.
35. Gonçalves AR, Fernandes C, Pasion R, Ferreira-Santos F, Barbosa F, Marques-Teixeira J. Emotion identification and aging: Behavioral and neural age-related changes. *Clin Neurophysiol*. 2018;129:1020–9. <https://doi.org/10.1016/j.clinph.2018.02.128>.
36. Runeson-Broberg R, Du Prel J-B, Westerholm P, Nordin M, Knutsson A, Alfredsson L, et al. Age-related associations between work over-commitment and zest for work among Swedish employees from a cross-sectional and longitudinal perspective. *Work*. 2017;57:269–79. <https://doi.org/10.3233/WOR-172555>.
37. Nusseck M, Spahn C. Vergleich der studienbezogenen Verhaltens- und Erlebensmuster bei Musikstudierenden des künstlerischen Hauptfaches und der Schulmusik. *Musikphysiologie und Musikermedizin*. 2013;20:117–25. German.
38. Spahn C, Voltmer E, Mornell A, Nusseck M. Health status and preventive health behavior of music students during university education: Merging prior results with new insights from a German multicenter study. *Musicae Scientiae*. 2017;21:213–29. <https://doi.org/10.1177/1029864917698197>.
39. Antonovsky A. Health, stress, and coping. San Francisco: Jossey-Bass; 1979.
40. Akoglu H. User's guide to correlation coefficients. *Turk J Emerg Med*. 2018;18:91–3. <https://doi.org/10.1016/j.tjem.2018.08.001>.
41. Cohen J. *Statistical Power Analysis for the Behavioral Sciences*. Hoboken: Taylor and Francis; 1988.
42. Bundesagentur für Arbeit [Internet]. Nürnberg: Beschäftigungst Statistik, 2023 [cited 2023 Sept 23]. Available from: <https://statistik.arbeitsagentur.de/DE/Navigation/Statistiken/Fachstatistiken/Beschaeftigung/Beschaeftigung-Nav.html>.
43. Bundesagentur für Arbeit [Internet]. Nürnberg: Beschäftigungsstatistik der Bundesagentur für Arbeit: Stichtag 30.06.2021 [cited 2023 Sept 23]. Available from: https://statistik.arbeitsagentur.de/SiteGlobals/Forms/Suche/Einzelheftsuche_Formular.html?nn=1523064&topic_f=beschaeftigung-sozbe-bo-heft.
44. Deutsches Musikinformationszentrum [Internet]. Bonn: Studierende in Studiengängen für Musikberufe – nach Frauen, Männern und Ausländer*innen; 2021. [cited 2023 Sept 23]. Available from: https://miz.org/sites/default/files/statistics/10_Studierende_Musikberufe_Frauen_Maenner_Auslaenderinnen.pdf.
45. Thielmann B, Böckelmann I, Schumann H. Work-Related Behavior and Experience Patterns Among Ambulance Service Personnel of Different Organizational Structures in Urban and Rural Regions. *J Occup Environ Med*. 2022;64:26–33. <https://doi.org/10.1097/JOM.0000000000002324>.

46. Freudenberger HJ. Staff Burn-Out. *J Soc Issues*. 1974;30: 159–65. <https://doi.org/10.1111/j.1540-4560.1974.tb00706.x>.
47. Maslach C. Understanding burnout: Definitional issues in analyzing a complex phenomenon. In: Paome WS, ed. *Job Stress and Burnout*; Beverly Hills, Sage Publishers; 1982. p. 29–40.
48. Thielmann B, Yurkul T, Zavgorodnij I, Kapustnik W, Böckelmann I. Zusammenhänge von Persönlichkeitsprofilen und arbeitsbezogenen Verhaltens- und Erlebensmustern bei weiblichen Lehrkräften. *Zbl Arbeitsmed*. 2019;69:133–43. <https://doi.org/10.1007/s40664-018-0318-1>. German.
49. Voltmer E, Wingenfeld K, Spahn C, Driessen M, Schulz M. Work-related behaviour and experience patterns of nurses in different professional stages and settings compared to physicians in Germany. *Int J Ment Health Nurs*. 2013;22:180–9. <https://doi.org/10.1111/j.1447-0349.2012.00855.x>.
50. Voltmer J-B, Voltmer E, Deller J. Differences of Four Work-Related Behavior and Experience Patterns in Work Ability and Other Work-Related Perceptions in a Finance Company. *Int J Environ Res Public Health* 2018. <https://doi.org/10.3390/ijerph15071521>.
51. Schaarschmidt U, Fischer AW. Work-related behavior and experience patterns – Test label AVEM. Mödling, Austria: Schuhfried GmbH; 2019.
52. Böckelmann I, Kirsch M. Zufriedenheit mit den Arbeitsbedingungen und das Burnout-Risiko der Pädagogen an den Musikschulen: ein Altersvergleich. *Zbl Arbeitsmed*. 2023;73:277–88. <https://doi.org/10.1007/s40664-023-00510-3>. German.
53. Napora E, Andruszkiewicz A, Basińska MA. Types of work-related behavior and experiences and stress coping strategies among single mothers and mothers in relationships differentiating role of work satisfaction. *Int J Occup Med Environ Health*. 2018;31:55–69. <https://doi.org/10.13075/ijomh.1896.01052>.
54. Heidemann C, Scheidt-Nave C, Beyer A-K, Baumert J, Thamm R, Maier B, et al. Gesundheitliche Lage von Erwachsenen in Deutschland – Ergebnisse zu ausgewählten Indikatoren der Studie GEDA 2019/2020-EHIS 2021: Robert Koch-Institut. <https://doi.org/10.25646/8456>. German.
55. Faller G. Future Challenges for Work-Related Health Promotion in Europe: A Data-Based Theoretical Reflection. *Int J Environ Res Public Health*. 2021. <https://doi.org/10.3390/ijerph182010996>.