

Quantitative study of the level of acmeological potential of rising physical education specialists

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Abstract:

Problem Statement: The study is devoted to determining the presence and characteristics of acmeological potential among rising Physical Education teachers. Acmeology is one of the developmental psychology approaches that focuses on the possibilities of maximum human development. The research relevance and novelty lie in the application of quantitative research methods to acmeological approaches and the attempts to create methods for measuring and evaluating acmeological phenomena that are acceptable for research practices recognized in the world. **Approach:** The research was carried out at the Kazakh Academy of Sports and Tourism (Almaty, Kazakhstan) and Zhubanov Aktobe Regional State University (Aktobe, Kazakhstan) and involved 252 third-year students. **Purpose:** The study is devoted to determining the presence and characteristics of acmeological potential among rising Physical Education teachers. The research relevance and novelty lie in application of quantitative research methods to acmeological approaches and the attempts to create methods for measuring and evaluating acmeological phenomena that are acceptable for research practices recognized in the world. **Results:** In the course of the research, a correlative study of the results of an objective assessment of the academic performance of participants and the results of two tests aimed at self-assessment of the quality of professional and acmeological goals on the Likert scale was carried out. **Conclusions:** The practical significance of the research lies in the application of its results to identify high-potential students and encourage their personal efforts to reveal the highest potential (the so-called “acme” potential). Further research should be focused on the study of separate important factors that are the predictors of the presence of high acme potential in physical education students, as well as on the ways of its actualization in professional activity.

Key Words: Acmeology, developmental psychology, life skills, personal development, physical education teachers.

Introduction

Acmeology is defined as a science, or a branch of psychology that considers the highest achievements and the highest self-realization of human potential as a separate concept (Dereka, 2016, 2018). The problem with acmeological research is that it is concentrated almost exclusively in the context of Russian pedagogical and psychological research. Acmeology did not permeate into Western psychology and pedagogy due to the fact that no evidence-based acmeological phenomena and methods of scaling and measuring them were developed; most concepts considered by Russian researchers in the acmeological context have different definitions in the studies by Western researchers (Fletcher & NíChróinín, 2021; Griban et al., 2019; O. Ivanii & I. Ivanii, 2020; Nielsen et al., 2017). The lack of interest in this approach to the study of psychology in Western research is explained by the fact that the concept is not put into real practice assuming that only what can be measured can be controlled. So far, no researchers have developed methods for measuring or accurately defining measurable variables in an acmeological approach (O. Ivanii & I. Ivanii, 2020; Jowett et al., 2016).

Achievement of the highest self-realization is mainly considered through definitions that do not lend themselves to quantitative assessment. It seems that acme defined as achieving maximum professional success and self-realization in the creative and professional aspect of activity can be scaled and objectively assessed (Dereka, 2018; Jenny & Rhodes, 2017; Sato & Haegele, 2018). As the highest level of self-realization, acmeology considers the maximum self-actualization in all its manifestations, which includes both moral development and the achievement of social recognition, a high level of emotional intelligence and physical

development, including the preservation of health and mental activity throughout life (Bengtson & Settersten, 2016; Demetriou et al., 2016; Entezari et al., 2018; Gibbs, 2019; Gelfo, 2019). The problem of the personal development of physical education teachers and their implementation of best practices became especially obvious and urgent after the analysis of the results of online teaching during the Covid-19 epidemic (Kim et al., 2021). The assessment of achievements and personal development is closely related to issues of age and development throughout life. The accumulation of experience and a change in life trajectory are visible metrics of changes that can show that a person is reaching acme as the highest point of their development (Fletcher & NiChróinín, 2021; Sparks et al., 2017).

In the field of pedagogy, the acmeological approach can help identify individuals capable of the greatest achievements in their professional field, as well as unlock the potential of those who may be ready for this and may have the potential they do not realize and use. The acmeological approach implies a wide coverage of personal qualities to be developed. It is naturally expected that the achievement of the maximum level in one professional area stimulates higher than average expected achievements in related areas, for example, the managerial competencies of future physical culture specialists (Ryskaliyev et al., 2020). The formation of psychological tools to support those who can achieve more is notably well developed in the field of sports pedagogy and physical education (Cronin & Allen, 2018; Cronin et al., 2018; De Meyer et al., 2016). This is due to the fact that modern people are less aware of their physical abilities compared to the intellectual ones, and physical development can often be used as a meta-model of personality development and the formation of personality traits, which are the predictors of the fullest realization of personal potential (Dereka, 2018; Ju, 2019; Pierce et al., 2017).

Theoretical frame of reference

Achieving the maximum personality development is closely associated with physical development. Although the relationship can hardly be confirmed and is not the subject of serious research, numerous studies argue that physical health maintenance contributes to the realization of personal potential, and the process of learning to perform various types of physical activity increases a number of capabilities of the nervous system and contributes to the formation of life skills (Sum et al., 2018; Vasconcellos et al., 2020; Wallhead et al., 2021).

The importance of physical literacy and the need to transfer it to students in the schooling process actively discussed by researchers from different countries in recent years (Lundvall & Gerdin, 2021; Young et al., 2021).

A number of studies in the field of physical education show a close relationship between the formation of healthy living and training skills and the development of personality traits associated with an improvement in the quality of life (Aydin, 2020). Studies also demonstrate the connection between competence in the field of physical fitness and health and goal-setting and the possibility of increasing achievements in the professional field and other areas important to the individual (Bean et al., 2018; Bidzan-Bluma & Lipowska, 2018). Much research has been concentrated on the relationship between life skills and physical education (Coimbra et al., 2021; Cronin & Allen, 2018; Cronin et al., 2020). In particular, the major role of a PE teacher is associated precisely with the improvement and inculcation of life skills including the ability and readiness to work hard, overcome obstacles, form and set goals, exercise self-control and self-awareness (Blankenship, 2017; Chen & Wang, 2017; De Meyer et al., 2016). There is a real correlation between the development of these life skills during physical training accompanied by the long-term support from the teacher and satisfaction of some basic emotional needs of the student. Different studies highlight different basic needs, but some of them coincide: teamwork and social recognition, social skills development, and relationship development. Social interactions are a core value in sports and physical activity for the vast majority of students (Chung, 2018; Cronin et al., 2020; Demetriou et al., 2016). However, this may not be the case for an adult audience; thus, research considering age plays a huge role (Kjellström & Stålné, 2017). However, such studies also show an increase in the social activity of the elderly and middle-aged people who are involved in regular physical activity (Entezari et al., 2018; Farrington, 2017). This effect can still be observed even when performing physical activities that do not involve mandatory interaction with training partners (Franzese & Rurka, 2016; Griban et al., 2019).

The acmeological potential of physical education teachers is also closely related to the social component of education and the formation of social ties. On the one hand, teachers strive to increase and develop their own social role and significance, and on the other, they must be ready to teach similar skills to their students (Blankenship, 2017; Chen & Wang, 2017; Cronin et al., 2018). In the modern pedagogical context, young students are viewed as the “potential of society to be revealed” rather than a “problem to be solved”. Sport is seen as an individual and group activity that includes regular exercises that are scheduled and involve competitions (Cronin & Allen, 2018). Some types of training and activities may not include competition, but they always include testing of the level achieved, which involves an element of competition either with other participants or with oneself in the process of personal growth (yoga and similar disciplines) (Taylor, 2017; Ulstad et al., 2016).

The acmeological approach can serve as a tool to form a stable interest and motivation both in physical activity and personality development in the process of physical training. Thus, the great role of a departure from

situational interest to personal and thematic interest in the formation of sustainable motivation for learning in the field of physical education was noted (Chen & Wang, 2017). Physical education should include the formation of behavioral and cognitive skills to increase self-esteem, as well as prerequisites for regulating physical exercises and shaping sports behavior (Stepanchenko & Briskin, 2019). The importance of creating a positive learning environment, which includes cooperation and collaboration when doing exercises, search for solutions in a number of sports games, formation of a common context with peers, is noted (Entezari et al., 2018).

The development of motor and assessment skills, and numerous aspects of neurophysiological activity of the brain during physical training contributes to an increase in self-esteem and can be a predictor of striving for better achievements not only in the field of physical development or sports but also in other areas (Coimbra et al., 2021). So far, a number of models for the formation of motivation and volitional control in the course of physical training have been developed; they take into account and positively affect the development of life skills and social aspects of student behavior (Bean et al., 2018).

Setting objectives

For the research purpose, a number of assumptions based on the studies focused on professional motivation, personal development, and acmeology discussed above are made. Acmeological potential is defined as the presence of a conscious and consciously or unconsciously realized aspiration to achieve the greatest self-realization and results in the field of professional activity and personality development. The level of academic achievement is taken as a metric of the professional development of students as good academic performance requires interest in learning, perseverance, consistency, regular learning efforts and other factors that are predictors of further great professional achievements (Sum et al., 2018; Tannehill et al., 2021; Ulstad et al., 2016).

The purpose of the study is to reveal the presence and characteristics of acmeological potential among students and rising physical education specialists. Thus, the following research objectives have been set:

- to find out whether there is a correlation between the level of academic achievement and the acmeological and professional goals of individual students and the research sample;
- to find out whether there is a correlation between changes in the level of academic achievement (improvement or deterioration of grades in a specialized subject) and self-esteem in the field of acmeological or professional goals;
- to determine whether there is a correlation between acmeological goal-setting and the professional goals of the respondents. The third task of the study aims to determine whether there is a connection between purely professional goals and acmeological motivations (achieving the greatest possible development and self-realization) of PE students.

Therefore, a null hypothesis has been formulated – there is no significant statistically reliable relationship between the level of acmeological goal-setting and the objective level of academic (professional) achievements.

Methods

Research design

The research methodology is based on the fact that there are no valid and tested quantitative methods to study acmeological values or their exact determination through parameterized variables. Therefore, the measurement was based on the subjective assessments of the study participants in comparison with their objective academic performance. By searching for correlations between various types of self-esteem and real academic achievements, which are assessed as a manifestation of professionalism in the case of students, the presence of acmeological potential and the desire to develop abilities to the fullest and maximize personal growth is established.

Professional accomplishments were objectively assessed based on the exam performance of the third-year Physical Education students in the two academic semesters. The first exam is considered as a pre-test, the second one is a post-test. Data comparison is required in order to identify changes in the quality of training (development of academic achievements) in the shortest test period for those students who set themselves clear and well-defined professional goals or have conscious acmeological goals (aspirations).

The second stage was carried out at the end of the second semester and involved two tests. The first test asked the participants to assess their awareness of professional goals on a 6-point Likert scale. Thus, 1 - a lack of professional goals or interest in them; 2 - there is an interest in the goals and awareness of the need to set them, but the goals themselves have not been set; 3 - there is awareness of the importance of goals and there are some vague goals related to further professional development; 4 - there are goals related to a professional career; 5 - there are professional goals and understanding of the ways to achieve them (intermediate goals); 6 - there are clearly defined goals related to further professional activities; the goals are recorded and managed, their achievement is controlled. The second test asked the participants to assess the presence of acmeological aspirations on a 6-point scale: "Do you have a desire to achieve the greatest possible development of your personality and professional level in the future? Do you dream of the greatest achievements possible? How do

you assess your desire to achieve the greatest results in your professional activity? " Therefore, 1 shows a lack of interest in the greatest achievements while 6 indicates the presence of a clear and conscious desire, the availability of a plan and specific actions, which, in the opinion of the respondent, should lead to their fullest self-realization. In connection with the ethics of the study, the participants were not asked to define their personal dreams and goals; it was only noted that the goals should be related to the professional sphere of pedagogy, sports, and physical education.

The division of the scales is based on a number of studies devoted to goal-setting and goal achievement (De Meyer et al., 2016; Rudolph, 2016; Taylor, 2017; Ulstad et al., 2016); it was also discussed and approved by the research participants before the study began. Thus, the face validity of the test was achieved. Based on the Likert scale, all the variables studied were reduced to a metric expression in the form of interval scales to apply Pearson's correlation coefficient. To solve the research tasks, the correlations between the average values of the objective exam results by groups that received a certain mark (those who received "5", "6", etc.) were studied. The presence of a correlation between the assessments of students' professional and acmeological goals was also considered. After that, a correlation between the results of the tests examining professional and acmeological goals and objective assessments of academic performance was checked. Separately, a correlation between the objective and subjective assessments of those participants who had a statistically significant change in the pre-test and post-test exam results, that is, an objective increase in academic performance, which in these conditions can be equated to professional growth and achieving professional goals, was evaluated.

Participants

The study involved 252 third-year students (5B010800-Physical Culture and Sports) of the Kazakh Academy of Sports and Tourism (Almaty, Kazakhstan; 158 people), and Zhubanov Aktobe Regional State University (Aktyubinsk, Kazakhstan; 94 people). The sample was randomly selected to maximize its representativeness. Taking into account the number of students in educational institutions (general population), the sampling error does not exceed $p = 1.48$. Thus, the sample can be considered representative.

The selection of third-year students (out of 5 years of study) is due to the desire to consider students who already have some extensive professional knowledge but have not yet faced with the need to choose a place of work and prepare for an independent professional life. In this case, the assessment of acmeological potential as readiness for the greatest self-realization along with the presence of conscious professional goals is the most representative; it is free from psychological pressure of the need for or lack of necessary knowledge for personal assessment and decision-making. The selection of the research sample is also based on a number of studies in the field of motivation and professional choice of students and the level of preparedness for the future professional activity (Stroebe et al., 2018; Sum et al., 2018; Vasconcellos et al., 2020).

Statistical instruments

For the purpose of a statistical analysis and an objective assessment of the survey results, the SPSS 26.0 package was used; to visualize and present the results obtained, the capabilities of the MS Excel 2019 program were used.

Ethical issues

All research participants were informed about the methods and purposes of the study and gave their personal consent to participate. No personal data were collected, analyzed or retained at the end of the study. Each participant received a unique random number to which the test data and exam results were linked. Thus, this ensured that the variables were assigned to each participant whose identity could not be identified.

Research limitations

The study did not seek to identify factors related to gender, age, background, social status or previous experience and the level of academic achievement of the participants. These factors can be quite important for determining the acmeological and professional potential of rising PE teachers. In addition, the study does not rely on approved test methods due to the lack of such, and the use of the Likert scale in this case should be recognized as limited for a more accurate assessment of the phenomenon under study.

Results

The analysis of the results of the two exams shows a picture that is extremely close to the standard normal distribution (Figure 1). This is due to the fact that during the study period there were no interventions in the process of teaching students and the purpose of the study was to establish the existing patterns of realization of the acmeological potential of rising specialists in physical education without interfering with the processes being observed. Statistical analysis of the results obtained (the assessment was based on a common 12-point scale; the lowest grade was 4) showed that there is no statistically significant difference between the results of the pre-test and the post-test when comparing the average number of students who received a particular point (they are within the standard deviation for each individual point). Pearson's chi-squared test for comparing two series of pre- and post-test results shows statistics that are significantly higher than the level required to

recognize the presence of a statistically significant deviation $\chi^2 = 0.128$. Based on this, it can be concluded that all estimates are on average within the normal distribution.

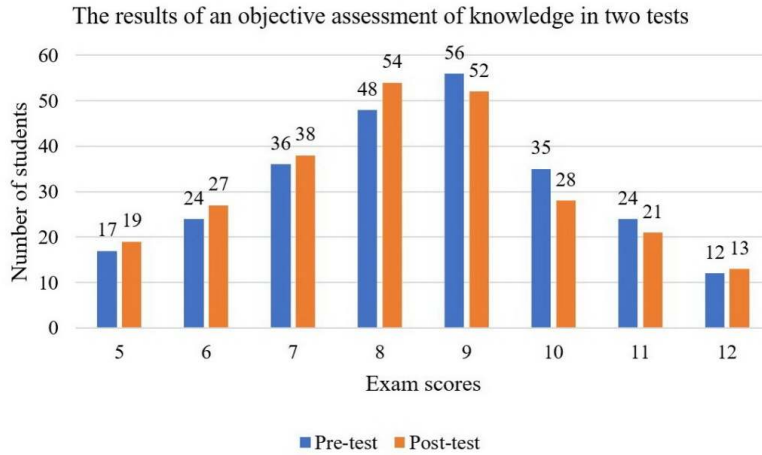


Figure 1. The results of an objective assessment of knowledge in two tests.

Figure 2 shows a visual comparison of participants' self-esteem in the context of acmeological and professional goals. It is noticeable that a much smaller number of participants have acmeological goals; however, in the mid-range context (grade 3 and 4, which determine an intermediate state when there is awareness of goals and their importance, but no conscious and active motivation and actions to achieve them) acmeological goals prevail over professional ones (grade 3). In our opinion, this indicates that most participants have dreams and values which they are not completely sure to realize and formulate precisely. Unlike professional goals, which can be more clearly defined based on social status, the availability of a future workplace and its assessment, an objective assessment of one's own knowledge and the desired income level, acmeological goals require goal-setting that goes beyond practical considerations.

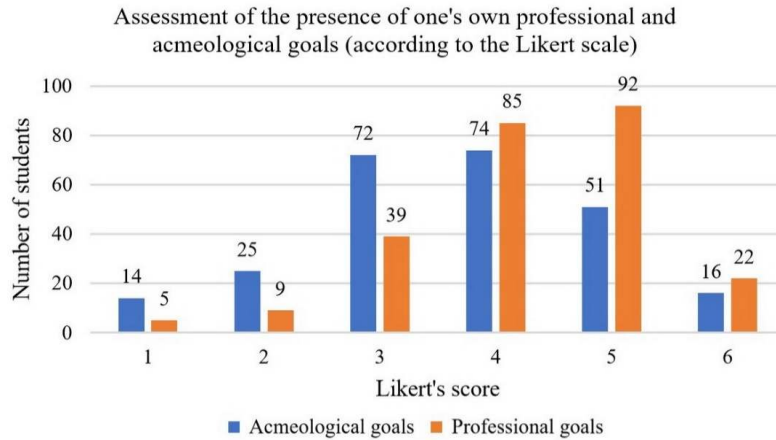


Figure 2. Assessment of the presence of one's own professional and acmeological goals (according to the Likert scale).

Based on this, those who already have specific goals and possibilities and methods to achieve them are characterized by the prevalence of professional goals (Figure 2 for grades 4-6). The comparison of the assessment of professional and acmeological goals by the research participants based on the Pearson's correlation coefficient showed an unexpected result presented in Table 1.

For those participants whose goals are more clearly defined, there is a significant and strong linear correlation between the assessment of acmeological and professional goals (0.763 for a grade of 4; 0.801 for a grade of 5 and 0.786 for a grade of 6). First of all, this demonstrates a higher level of self-awareness and self-esteem, as well as the level of motivation. Obviously, those who have already defined their goals better understand whether they will strive for the greatest self-expression and self-realization, or will achieve more distinct and obvious goals in the field of security, social recognition, and well-being.

Table 1. Pearson's Correlation Coefficient and Standard Deviation for Comparison of Acmeological and Professional Goal Assessment Statistics.

	1	2	3	4	5	6
<i>r</i>	0.422	0.322	0.458	0.763	0.801	0.786
SD	1.03	0.18	0.39	0.21	0.51	0.62

It should be noted that in this case professional goals are easier to measure while the acmeological ones provide a rather blurred assessment as a person is never able to accurately assess their potential that has not been developed yet. This can prevent students who have developed critical thinking and strive for clearly defined goals from the formation and realization of their acmeological potential. On the other hand, the real potential of self-realization of such individuals can be much higher and it is important to ensure that they do not limit its realization.

The statistical analysis based on the Pearson's correlation coefficient of the objective assessments and the assessment of acmeological goals by students did not demonstrate statistically significant correlations. All correlation values turned out to be below the baseline $r = 0.214$. A similar study of the correlation with the assessments of professional goals revealed a weak correlation: $r = 0.384$. Based on these results and given the studies described above, it can be concluded that, on average, the presence and awareness of acmeological goals does not affect the level of academic achievement in the sample. The presence and awareness of professional goals have a slight effect on students' performance; the presence of this relationship requires further clarification and research.

The average change in the pre-test and post-test results of each student when compared with the assessment of acmeological goals showed a high level of correlation: $r = 0.786$. Moreover, a high degree of linear correlation is observed both between changes in the performance for the better, and vice versa, when the assessments deteriorate. The deterioration of performance is associated with an assessment of acmeological motivation from 1 to 3 while the improvement – from 4 to 6. The absence of a notable change in assessments demonstrates a uniform distribution of all assessments of acmeological goals. As a result, an additional hypothesis was formulated: the change in the objective assessment of each student does not relate to the level of assessment of acmeological goals. The study of the latest statistics based on Pearson's chi-squared test showed that there were no statistically significant correlations $p = 0.432$, and the additional hypothesis was accepted.

Based on the results obtained, the null hypothesis of the study was discarded with clarification: the assumption that there is no connection between changes in academic achievement and the level of acmeological goals is discarded while the absence of such correlations in the context of the static indicators of academic performance is accepted for the sample. A detailed study of this result requires further research. At the moment, it is assumed that those students who have conscious and clear acmeological aspirations achieve better results; those who do not have a clear intention for the greatest self-realization do not achieve such results; other borderline cases are subject to the law of normal statistical distribution.

Discussion

The focus of most physical education researchers is on the development and transfer of life skills during studies, especially in school (Bean et al., 2018; Lerche et al., 2018; Pesce et al., 2016). This process is more often viewed as a form of ensuring a high level of personality adequacy in modern society; in our study, we deal with an important aspect of the formation of the desire for better achievements (Prnjak et al., 2019). The absence of a clear link between increased potential for better achievement and the real academic achievement or professional achievement is partially confirmed by other studies. Motivation that is not supported by the maintainance of the required environment and satisfaction of certain social needs may not lead to unlocking potential or achieving a goal set (Shentsova et al., 2018; Slater & Quinn, 2020). On the other hand, individuals who do not consciously set such goals but at the same time have aspirations or values associated with the greatest self-realization often achieve high results (Kelly & Updegraff, 2017).

In our study, we do not consider any specific methods of creating or transferring life skills and their impact on academic achievement or students. Such research is a challenge for the future. The differences between the high level of motivation and the statistical distribution of real results have already been noted in a number of studies, in which this phenomenon was associated with the differentiation between motivation and volitional goal-setting, intention, or readiness for action (Hill & Curran, 2016; Jowett et al., 2016; Rudolph, 2016). It is in the course of targeted physical training that at the level of physical stress the experience of distinguishing between a dream or an idea and a really attainable level of development that requires planning and regular efforts can be formed (Sato & Haegele, 2018). Researchers indicate that a significant factor in the development of physical education teaching can be the proactive integration of school rules, community participation and school coexistence as motivation and emotional well-being factor for students and support of teachers' work (Gil-Espinosa, 2021). The development of emotional control may be due to the fact that, in

reality, efforts to achieve the desired goal may be unpleasant, exhausting, or not bringing temporary short-term satisfaction (Griban et al., 2019).

Mindfulness and clear goal setting, or the awareness of an intention to achieve better results than one might expect, are often associated with higher measurable results; this applies not only to physical education (Sparks et al., 2017). However, no direct relationship has been found between these factors so far; researchers note only the level of engagement in activities, the level of motivation, or the degree of social support that form the basis for greater achievements (Kudláček et al., 2020). In our study, we consider those factors that are clearly associated with intrinsic motivation; social attitudes and the influence of the environment remain outside the scope of assessment and have no significant impact. Thus, only the connection between the formed potential, which we call acmeological potential, and real achievements is revealed.

As for the quality of education, it is important to note the uniformity of the distribution of grades based on exam results revealed in the course of the study, which indicates the absence of significant incentives or applied methods that would break the monotony of the statistical distribution of academic success (Nielsen & Haun, 2016). The achievements of those individuals who realize or can realize their acmeological potential are hidden within the normal distribution of assessments being a part of these statistics and one of their factors. A possible goal of changing pedagogical approaches would be to bring acmeological potential to a higher level in the mind of students, which would make it possible to significantly increase both academic performance and readiness for further specialized pedagogical and sports activities and the level of professional achievements after graduation (Kline et al., 2018).

Conclusions

The research seeks to measure quantitative approaches to the study of the potential of students for achieving the greatest professional and personal development in the field of physical education. The acmeological approach in the field of developmental psychology that is not popular in the West is used; it focuses on the maximum development of the individual's capabilities as their major life goal and basic value. In this area, methods of adequate quantitative analysis, statistical studies, or measurement scales have not been applied yet, and appropriate research methods that could imply a measurable practical result have not been identified.

The novelty of the study lies in the application of quantitative research methods to acmeological approaches and the creation of approaches to the measurement and assessment of acmeological phenomena that are acceptable for modern research practices. The research was carried out at the Kazakh Academy of Sports and Tourism (Almaty, Kazakhstan) and Zhubanov Aktobe Regional State University (Aktobe, Kazakhstan) and involved 252 third-year students. The study relied on the correlation analysis of the results of an objective assessment of academic achievement and the results of two tests assessing the level of professional and acmeological goals based on the Likert scale. Within the framework of the study, the acmeological goal is defined as a conscious or unconscious aspiration to achieve the highest level of professional and personal self-realization.

The study hypothesis that there is no relationship between academic achievement and the level of acmeological and professional goals was generally confirmed in the context of the sample means but rejected in relation to the correlation between changes in academic performance and the presence of acmeological goals ($r = 0.786$). The research results can be used to identify high-potential students and encourage their personal efforts to reveal the highest potential (the so-called "acme" potential). Further research should be focused on the study of separate important factors that are the predictors of the presence of high acme potential in physical education students, as well as on the ways of its actualization in professional activity.

Conflicts of interest – The authors declare that they have no conflict of interests.

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