Extracurricular Activities in Medical Education: An Integrative Literature Review

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Abstract

Background: The importance of extracurricular activities (EAs) has been emphasized in medical education. These activities could enhance medical students' emotional and physical health and afford them developmental opportunities. Despite the growing amount of research related to this theme, few studies review and synthesize the existing literature. This literature review aims to provide an understanding of the educational implications of EAs in medical colleges and constructs an integrated conceptual framework concerning their types and learning outcomes.

Methods: An integrative literature review was conducted following Torraco's method, which helped generate a new framework for the given topic. The authors utilized Scopus and PubMed as databases, using search terms "extracurricular," "medical," and "students." Initially, titles and abstracts were screened to include relevant studies, and the researchers verified the eligibility of the articles by following the inclusion and exclusion criteria. Of the 263 articles identified, 64 empirical studies were selected for further review.

Results: EAs in undergraduate medical education can be classified into direct extracurricular activities and indirect extracurricular activities, the latter of which is sorted into nine sub-categories. We identified seven main categories regarding the learning outcomes of EAs. In addition to general activities (e.g., pro-social activities, team sports), some distinctive activities such as research have been largely addressed in previous studies. The results of EAs were discussed in relation to academic growth, career development, and psychological experiences.

Conclusions: This review identified the types and learning outcomes of EAs in the context of medical education, thereby suggesting ways to improve the quality of EAs and maximize their educational effects.

Background

The schedules of medical students are characterized by a heavy academic load, frequent tests, and clinical clerkship. They also invest their time and effort in extracurricular activities (EAs). More than 60% of medical students participate in EAs [1, 2] and spend 9.8 hours per week on them [3]. EAs are essential in the context of medical education because these activities serve as a buffer against the stress and burnout developed in an academically taxing environment [2, 4]. Additionally, they provide medical students with developmental opportunities to foster self-esteem, build constructive peer relationships, and enhance student agency [5]. With the global inclination toward student-centered education and the idea that the fundamental goal of assessment should be to foster students' competence and subsequent learning momentum, a criterion-referenced grading system is highly regarded by many educators [6–7]. The significance of EAs in medical education is growing because it deals with diverse activities to promote personal development across various domains that cannot be cultivated only by the curriculum [8].

The concept of EA has been defined differently by various scholars. However, recent studies reflect a consensus that EAs, as academic or non-academic activities that are conducted under the auspices of the school and occur outside of regular classroom time, are not part of the curriculum [9–11]. Generally, EAs do not involve grading or account for academic credits, and participation is optional and voluntary for students [10]. Previous studies classify EAs based on the characteristics of the activities [see 12, 13]. However, an agreed standard regarding the categorization of these activities does not exist. The classification of direct and indirect EAs by Bartkus et al. (2012) is meaningful because it provides a secure conceptual basis to encompass a wide range of activities [10].

A growing body of research investigates EAs in medical education. However, these are conducted in fragmented ways, which could restrict a holistic understanding of the given topic [10]. For example, there are ample studies about research activities, though it was not limited to the extracurricular programs (for a review, see [14]). Even though EAs are conducted in medical education, it is difficult to find a comprehensive study that covers the types and effects. We aim to review the research and summarize what kind of EAs are being conducted and their outcomes in medical colleges. Thereby, this study would suggest a comprehensive model of EAs in medical education which elaborates on their types and learning outcomes.

Methods

The integrative literature review is a form of research that generates new frameworks and perspectives about the topic by reviewing, critiquing, and synthesizing representative literature in an integrated manner [15]. It is particularly useful when a large body of studies has been conducted, but no comprehensive perspective from which to view a certain topic has been developed. We utilized an integrative literature review to capture the dynamics and development and present a holistic view as previous studies on EAs in medical schools become more abundant and diversified [15].

While undertaking initial research in September 2022, the authors utilized the Scopus and PubMed databases, using the keywords “extracurricular,” “medical,” and “students” to identify the most relevant articles. This initial search yielded 221 matching articles, which were pared down using a staged review [15]. We only utilized those articles elaborating on EAs in undergraduate medical education. The article inclusion criteria required that all articles should be peer-reviewed, available in full text, and written in English. We further limited our review to articles that investigated the given topic empirically and were published in the last ten years (2013- September 2022).

The criteria of exclusion are as follows. First, studies conducted among high school or graduate students and students with other majors (e.g., nursing and veterinary medicine) were excluded. However, articles that reported the study results of medical students separately from those of other health professional students were included. Additionally, studies that involved graduate students who participated in extracurricular experiences in their undergraduate years were included. We excluded descriptive studies that merely reported the perception of medical students regarding EAs because they only presented

constructs such as students' satisfaction, engagement, and motivations for participation without any connections to learning experiences and relevant discussions. Essentially, articles that did not explicitly address the learning outcomes of EAs in medical schools were omitted. This process was conducted on full texts, and ultimately, 64 articles were selected for further review. Figure 1 shows the process of screening and selecting articles for review.

Most of the selected articles present a quantitative study (*n = 46*), where the data was mostly collected via questionnaires. Twelve studies utilized mixed methods, especially qualitative interviews with quantitative questionnaires or qualitative self-reports with quantitative questions. There were six qualitative studies in which the scholars mainly applied the interview method with self-reflection and a qualitative survey. Although no particular chronological trends were detected across the chosen time period, we found that extensive research has been conducted in recent years.

Results

Figure 2 describes the types and outcomes of EA education. Some articles overlapped in more than one category when they covered several EAs or the EA was multifaceted with various effects.

Types of EAs

EAs can be divided into direct and indirect EAs, with the indirect category comprising sub-categories. The research team extracted the types of EAs reported on the target articles and counted the number of targeted articles that belong to each category. A direct extracurricular activity (DEA) is more closely related to the learners' major or curriculum, while an indirect extracurricular activity (IEA) is relatively unassociated with them [10]. The former included 18 articles [16–33] and the latter comprised 47 articles.

IEAs contain the characteristics of activities with nine categories (pro-social activities, performance activities, team sports, school involvement, academic clubs, research activities, career development, unspecified, et cetera). The classification of IEAs was based on five criteria from the Michigan Study of Adolescent Life Transitions (MSALT), a longitudinal study of sixth-graders in Southeastern Michigan from 1983 to 1997 [34]. Pro-social activities refer to church attendance and/or volunteer and community service [34] and included 11 articles [2, 35–43]. Performance activities indicate school band, drama, and/or dance [34] and comprised five articles [2, 3, 37, 44, 45]. Team sports involve participation in one or more school teams [34] included seven articles [2, 41, 46–50]. School involvement represents the student government, pep club, and/or cheerleading activities [34] and included four articles [3, 41, 51, 52]. Academic clubs refer to debate, foreign language, math or chess clubs, or science fairs [34] which do not directly relate to the regular curriculum. These comprised five articles [2, 37, 53–55]. Activities about research and career development, which are unique traits of medical education, were also added here. Research activities include thesis writing, attending academic conferences, and special lectures on research methodology and included six articles [18, 41, 56–59]. Career development covers activities to explore career paths as a prospective medical expert included four articles [25, 39, 52, 60]. Additionally,

there were 11 unspecified IEAs that could not be identified in the targeted articles [61–71]. Ten other non-classified IEAs included counseling [72, 73], teaching [3, 74], mindfulness [75], professional exchanges [76], Asian-American-related EAs [77], video games [45], international exchanges [78], and distinction [52].

Outcomes of EAs

The research team perused the results and discussion sections of the target articles, extracted the keywords, and coded the keywords into six categories; academic outcome, health system science (HSS) competency, psychological outcome, teamwork and communication skills, research engagement and competency, and career development. The keywords that did not belong to any categories above were grouped under “miscellaneous topics.”

Academic outcome

Academic outcomes are further categorized into three domains: knowledge, skill, and attitude. In total, 15 articles reported academic outcomes. Academic knowledge can be measured by test scores or course averages; two studies used a grade point average (GPA) [56, 62] and one used a percentile rank [3]. Most researchers provided a test to measure the students’ knowledge of a specific topic [17, 19, 24, 28, 31, 32, 56] (e.g., anatomic knowledge, ultrasound knowledge). They used pre-and post-tests to evaluate the effect of EAs and found a positive relation between academic performance and EA participation. However, the COMLEX Level 1 performance was not related to the EA [69].

Only three papers reported academic skills as outcomes of EA participation [16, 28, 45], two of which showed that hands-on practice in the extracurricular program was helpful in improving diagnostic reasoning and procedural skills [16, 28]. Academic attitude includes a perceived understanding of the learned knowledge or skills or self-reported confidence about one’s clinical skills [22, 28, 32, 44] and absence at school [46]. Generally, EA participation increased self-reported understanding and confidence. In one study, however, it did not boost confidence in using ultrasound, even though it increased ultrasound knowledge [19].

Health system science (HSS) competency

HSS is a framework to understand healthcare as a system focusing on patient care [79]. HSS has six core domains: health care structure and process, health system improvement, value in health care, population, public, and social determinants of health, clinical informatics and health technology, and healthcare policy and economics [79]. Eight articles reported improved competency under health system improvement and population and public health. Under health system improvement, students showcased a more positive attitude toward quality improvement [30, 54] and increased knowledge of healthcare management [72]. Students also learned about minorities [52, 77], infectious diseases, and preventive strategies [23, 38, 42], which fell under population and public health.

Psychological outcome

14 articles surveyed the psychological states and motivations for the outcomes of EAs. Most of them focused on negative states: stress and burnout [2, 27, 41, 49, 50, 52, 61, 65, 71, 75], anxiety, and aggression [64, 65]. Two papers investigated positive states: tolerance of ambiguity and uncertainty [48], and work-life balance [70]. EA participation alleviated the negative states and increased the positive states, except for one EA [37]. The two leading psychological factors analyzed were higher efficacy [37] and more stress [52].

Two papers dealt with motivation, each of which investigated goal orientation and intrinsic motivation. Under goal orientation, engaging in physical activity was positively associated with the mastery approach [49]. Under intrinsic motivation, students reported higher autonomy in extracurricular sessions than in mandatory sessions [26].

Teamwork and communication skills

Medical students need to develop teamwork and communication skills as they have to collaborate with other health professionals while attending to patients. Seven articles investigated the effects of EA on teamwork and communication skills. Students who participated in EAs considered teamwork valuable [40], reported increased knowledge, exhibited positive perception of nurses and pharmacists [76], and showed improved cultural competency [78], leadership [51], and communication skills [18, 38, 72].

Research engagement and competency

It is essential for medical students to conduct research and develop research competency considering the importance of evidence-based medicine and physician-scientist [80]. Six articles investigated various variables related to research. One study compared the students' knowledge of critical thinking and research methods before and after an ultrasound workshop [18]. Two papers measured attitudes toward research and self-perfection about research skills [56, 59], and two studies investigated actual involvement in research, like continuing research in Ph.D. and conference attendance [35, 58]. One study reported that EA participation increased both intention and interest in paper publishing and actual paper publishing [57]. EAs were beneficial for increasing research skill and knowledge and cultivating a positive and more involved attitude toward research.

Career development

The careers of most medical students seem to be determined upon their admission to the medical college. However, they need further research to choose a major and to become a professional. Ten articles investigated the outcomes related to knowledge and attitude about specialized medical fields, and five articles focused on professionalism. Among the articles on career choice, some measured the match rate [25, 39, 43, 73], the students' interest in and intention for applying to specific majors [21, 25, 36, 60], or the knowledge and perception of the majors [27, 32, 36, 51, 60, 73]. Professionalism was mainly about patient care [36, 40, 44] and medical ethics [29, 33]. These researchers reported that having exposure to specific fields helped students develop a favorable attitude and deepen their understanding of the specialties, which contributed to the development of professionalism.

Miscellaneous topics

The outcomes from 13 articles did not fall into the six categories mentioned above. Three articles reported that EA participants could help students manage their time and stress [18, 51, 75]. Five articles investigated the relation between EAs and physical health or physical ability [20, 47, 63, 67, 68], such prevalence of tuberculosis infection, vaccination coverage, and visual-spatial abilities. Two articles mentioned time use; participation in academic-scientific programs negatively predicted the use of social networks [53], and students reported that they lost time due to EA participation [52]. Students reported that they could communicate and feel connected with faculty and students by participating in EAs [52, 55]. The last two covered what the other researchers had not dealt with; confidence [74] and passion in teaching and emotional intelligence [66], both of which were positively related to EA participation.

Discussion

This review synthesized the types and effects of EAs in medical colleges. To our knowledge, this is the first study that attempts to develop an overarching picture of the importance of EAs in undergraduate medical education and their implications. The integrative model in this paper helps in gaining a comprehensive understanding the role of EAs in colleges with distinctive characteristics of medical education.

We embodied the type of EAs by discovering unique EAs that were found in medical education. In earlier education studies, EAs were generally classified. Shamsudin et al. (2014) sorted EAs into physical, educational, and social programs [80]. Gilman et al. (2004) differentiated structured collaborative activities from solitary and non-structured activities [82]. Contrarily, the MSALT classification system had the advantage of providing subdivisions based on activity characteristics [83]. However, a concrete EA-type system reflecting the features of undergraduate medical students was needed, in that this classification system was for adolescents. We additionally sorted research and career development activities in the process of presenting the integrated model (Fig. 2). We expanded the MSALT classification to fit it within the context of medical education.

Our findings about the outcomes of EAs reflect the features of medical education, replicating the prior study on higher education [84]. Firstly, as reported in previous research, EA participation increased GPA [85, 86]. It also developed medical knowledge, skills, and self-perception of the learned materials and skills. While HSS is treated as a third curriculum [79], concerns exist about altering the regular curriculum to add class time for HSS given its hectic nature [87]. We present cases where students can develop their HSS competency in EAs. Secondly, EA studies in medical education focused more on negative states like stress and burnout, while studies on non-medical undergraduate students focused on mental health or well-being [88, 89]. This is because stress and burnout are prevalent among medical students [41]. Thirdly, medical students, like engineering students, developed their knowledge, attitude, and skills needed for teamwork [90]. Fourthly, extracurricular research programs focused on fostering positive research attitudes and increasing research involvement, while mandatory research programs in medical education

focused more on developing research knowledge and skills [91]. Also, medical students deepened their understanding and interest in specific specialties and develop professionalism through EA participation. This may imply that the regular curriculum, including clerkship, provides limited opportunities for exploring specialties. Lastly, the typical outcomes among miscellaneous topics were physical health and physical ability. Only two articles demonstrated a sense of belongingness and communication with others as positive outcomes of EA. Medical students' motivation for EA participation is networking [1, 92] and interaction with faculty and peers, which has a positive effect on students' satisfaction and career motivation [93]. These need to be considered as important outcomes in medical education.

Even though we tried our best to comprehensively investigate all apposite studies, the selection criteria might have excluded some relevant articles. Thus, we might have missed some relevant studies because of the nature of the search strings used, that is, if the keywords did not appear in the title or abstract. Furthermore, this review excluded studies published in languages other than English. Thus, we could not capture the dynamics of EAs in non-English speaking countries; this may lead to an increased risk of bias and limit the generalizability of findings. In the process of deriving an integrative model, we might have missed some distinguishing features of EAs that are specific to the social, institutional, and educational context of individual countries and schools. However, three main researchers took turns examining the articles to derive the most balanced and integrated model.

Based on the analysis and discussion, we recommend further research and implications for educators in undergraduate medical education. First, future studies should focus on the concreteness and subdivisions and their definitions of EAs in medical education. This is because the systematization of conceptual definition and classification system guarantees the accumulation of productive knowledge. Second, further research exploring the balanced and effective growth of students' capacities through EA is needed. We outlined the effects of EA; EA is concerned with those factors that are rarely covered in the regular curriculum. Hence, the effects of EA can span across several domains with a neutral or detrimental effect. Thus, consideration about using EAs effectively should be made. Third, follow-up research will be required to overcome the bias toward quantitative research and encourage qualitative research. It is expected that researchers will be able to find the unforeseen aspect and effects of EA through various qualitative methods such as interviews, discourse, and observational records.

We will now suggest the implication of the integrated model for medical educators and practitioners. First, we recommend that medical educators provide students with diverse and balanced EAs to provide them with rich learning experiences. This is because the outcomes of EAs can be derived differently depending on the EA type. Second, schools need to explain the expected outcomes of EAs and regularly follow up on the students' experience to benefit from EAs without losing time and stamina. It is difficult to gauge the effects of EAs, as it does not accompany assessment. Furthermore, it is possible that students feel stressed or lose study time owing to EA participation. Schools can assist the students' choice and participation in EA by explaining and checking the effect of EAs.

Conclusion

This study aimed to collect and synthesize previous articles that dealt with the EAs in undergraduate medical education and their learning impacts, thereby presenting an integrative model of the given topic. Despite a growing emphasis on EAs and the emergence of various types of research on it, there is no holistic approach to embrace the broadness of previous studies in a collective way. Therefore, this integrative review attempted to expand the understanding of the relevance and implications of EAs to the learning experiences of undergraduate medical students.

EAs in undergraduate medical school were classified into two main categories: DEAs and IEAs. The latter can be further classified into nine categories. It was found that IEA is more widely implemented than DEA, among which pro-social activities ranked at the top, followed by team sports and research activities. Regarding the outcomes of EAs, we identified seven main categories. Most of the selected articles dealt with academic outcomes and career development, which are deeply related to major-specific knowledge, clinical skill, and interest or intention in a certain medical specialty. Psychological outcomes such as burnout and stress represented the second most common category, which reflects the distinctive nature of a medical education context.

Abbreviations

EA: Extracurricular Activity; DEA: Direct Extracurricular Activity; IEA: Indirect Extracurricular Activity; MSALT: Michigan Study of Adolescent Life Transitions; GPA: Grade Point Average; HSS: Health System Science

Declarations

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Authors' contributions

Research theme: HJ. Study design: SK, HJ, HC. Data collection: SK, HJ, HC. Supervision: JY. Writing manuscript: SK, HJ, HC. Literature review: SK, HJ, HC. Data analysis: SK, HJ, HC. Preparation of figures and supplementary material: SK, HC. Critical review: JY. All authors have read and approved the manuscript.

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Availability of data and materials

The dataset used during the current study is available from the corresponding author upon reasonable request.

Ethics approval and consent to participate

Not applicable.

Consent for publication

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Competing interests

The authors declare that they have no competing interests.

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Figures

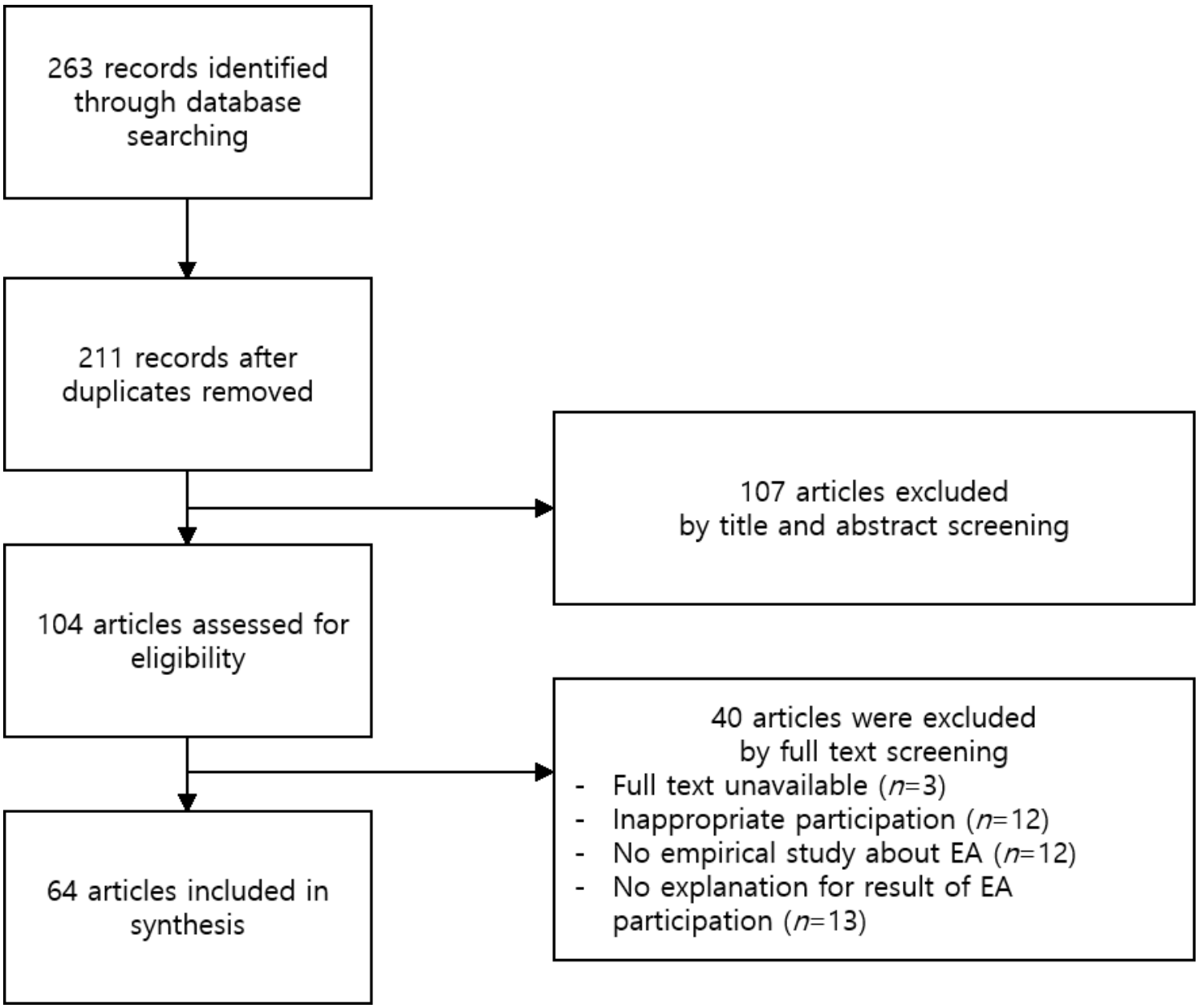

Figure 1

Flow diagram of the screening and selecting processes in this review

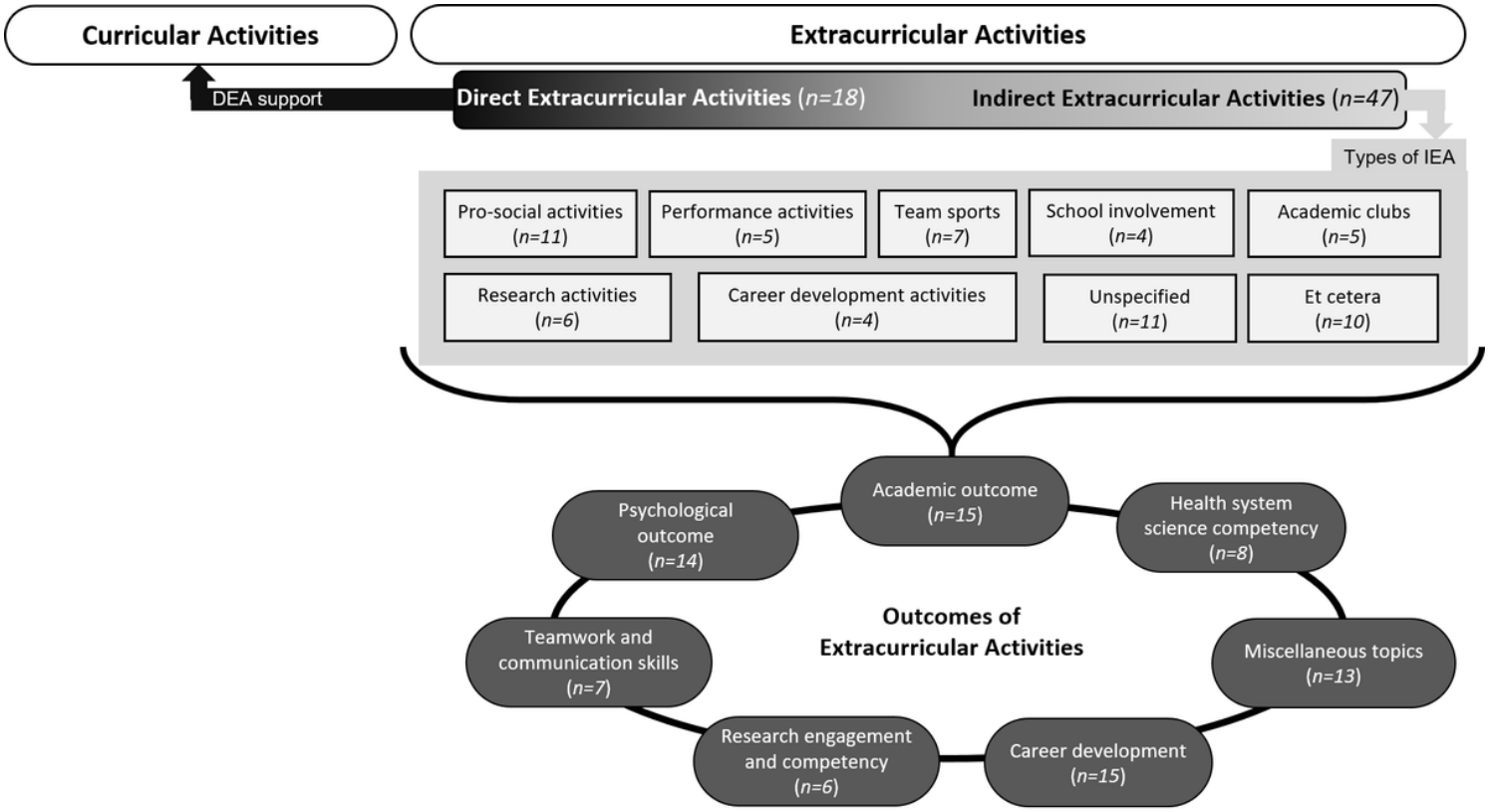

Figure 2

Integrative model of the types and outcomes of extracurricular activities in medical education