

RESEARCH REPORT

Anatomy education experiences of physical education professionals in a wellness-centered era: Evidence from South Korea

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Funding information

National Research Foundation of Korea, Grant/Award Number: 2022R111A1A01063123

Abstract

Understanding human anatomy is crucial for professionals working in physical education-related fields. However, anatomy education in South Korean universities is often perceived as insufficiently aligned with professional demands. This study aims to document current experiences and perceptions of anatomy education among individuals engaged in physical education and identify areas where educational provision may not fully align with professional needs. A cross-sectional online survey was conducted among 730 individuals involved in physical education-related fields in South Korea. Participants reported demographic characteristics, anatomy education experiences, and perceptions regarding the sufficiency and relevance of anatomical knowledge. Group differences were examined using one-way analysis of variance (ANOVA). Participants rated their overall anatomy knowledge at a mean score of 3.40 out of 5, with significant variation across professional orientations ($p < 0.001$). While 48.1% of respondents identified cadaver-based training as the most effective educational method, such training was largely absent from university curricula and mainly accessed through private programs. Costs and satisfaction levels differed significantly, with external programs often perceived as higher in quality despite greater financial burden. These findings provide a national snapshot of perceived experiences and expectations regarding anatomy education among individuals in physical education-related fields in South Korea. The results highlight persistent discrepancies between university-based anatomy education and professional requirements, particularly regarding practical and cadaver-based learning opportunities. Although this study does not directly evaluate university curricula, the documented perception patterns may inform efforts to better align anatomy education with practical demands of non-medical professional training.

KEYWORDS

anatomy education, exercise professionals, exercise science, Korea College Education, perceptions, physical education, survey study

INTRODUCTION

Since 1973, the National Athletic Trainers' Association (NATA) has emphasized healthcare-based education. However, South Korea's physical education curriculum lags behind, failing to meet professional needs, particularly in anatomy education. Researchers have found that professionals are primarily motivated to pursue continuing education because of the challenges they encounter in their daily practices.¹ Understanding human anatomy is crucial in health-related fields because it provides essential insights into the structure and function of the human body.² Anatomy forms the foundation of disciplines such as physiology, biochemistry, pharmacology, histology, pathology, and semiology.³ For sports and exercise science students, mastering anatomical vocabulary and concepts is vital for understanding bodily movements and the locomotor apparatus in response to physical exercise.⁴ Despite its importance, most research on anatomy education focuses on medical students, emphasizing academic outcomes and perceptions of teaching methods.

The methods used to train physical education professionals differ worldwide. In France, the STAPS (Sciences et Techniques des Activités Physiques et Sportives) kinesiology program offers specialization in five areas: physical activities and health, education and motor development, sports management, sports training, and sports ergonomics and motor performance.⁵ Conversely, in the United States, the National Commission for Certification Agency (NCCA) oversees certification processes and provides national recognition for various qualifications. Physical education majors in the U.S. can pursue advanced physical therapy for exercise prescriptions. In contrast, South Korean physical education practitioners face limitations such as restrictions on double majors in physical therapy at the undergraduate level and a lack of qualifications for advanced practice. Equivalent national professional bodies and standardized qualification pathways comparable to those in some other countries are not yet fully established in South Korea, and its professionals have limited authority compared to their international counterparts. Consequently, many practitioners in South Korea report relying primarily on university-based anatomy education that they perceive as insufficient for professional practice, leading them to pursue additional training through private organizations or international programs such as NATA and the National Strength and Conditioning Association (NSCA), despite associated financial and language-related barriers. Although South Korean physical education majors significantly contribute to public health by training diverse groups, including athletes, infants, the elderly, and individuals with disabilities, the state certifications—Sports Instructor and Health Exercise Manager—do not explicitly specify requirements for anatomy education within their formal assessment frameworks. Anatomy is not included as a dedicated test subject in Sports Instructor certification categories, and although the Health Exercise Manager qualification addresses health and fitness evaluation and functional anatomy, detailed requirements for anatomy education are not explicitly specified within university-level physical education curricula. This necessitates a reassessment of the current university curriculum to better align with professional requirements.

In South Korea, physical education is primarily a tertiary-level academic discipline offered at undergraduate and graduate levels. Unlike many countries where coaching, sports science, rehabilitation, and elite athletic development follow separate educational tracks, these career pathways in South Korea are often rooted in the same university-based physical education programs. Students enrolled in physical education programs include current or former elite athletes as well as individuals preparing for careers in education, rehabilitation, and health-related professional fields. Knowledge of anatomy is crucial for safe and effective practices in physical education and related fields. Despite its importance, there is an ongoing debate regarding the adequacy of anatomy education, particularly with the shift toward integrated curricula that reduce contact hours for gross anatomy. Previous studies have raised concerns about the decline in anatomy knowledge due to reduced teaching time, changes in pedagogical approaches, and the perceived outdated nature of traditional teaching methods.^{6–9} Although dissection remains the most popular method for studying gross anatomy, it is rarely used in undergraduate non-medical courses such as sports and exercise, nutrition, and nursing. In South Korea, cadaver dissection is legally limited to medical, dental, and oriental medical students and their faculty, as outlined in relevant laws; undergraduate programs in physical education cannot conduct dissection-based instruction, regardless of intent. Similar challenges related to anatomy education have been reported in other non-medical programs, such as dental hygiene, where faculty and students expressed concerns regarding limited exposure to gross anatomy.¹⁰ This structural restriction contributes to the lack of hands-on anatomical learning opportunities. Research has demonstrated that anatomy taught through dissection yields better anatomical knowledge than other methods.¹¹ The lack of diversity in teaching methods and a shortage of qualified anatomists, particularly those specializing in physical education, further hinders anatomy education.^{12,13}

As sports and physical activities become mainstream, there is a growing need for expert training to ensure effective and safe practices. Physical education professionals play a crucial role in this shift, highlighting the importance of enhancing their anatomical education. Accordingly, this study does not directly evaluate university curricula. Instead, it examines experiences and perceptions of anatomy education among students and professionals in physical education-related fields as a foundational step toward understanding current educational alignment with professional practice. By documenting feedback from students and professionals regarding their anatomy education experiences, this study provides foundational information that may support future discussions on curriculum development aimed at enhancing professional competency.

MATERIALS AND METHODS

Study design and participants

This cross-sectional survey study included 730 individuals either majoring in or working in physical education-related fields in South Korea. The target population was defined to capture a

heterogeneous group of individuals who encounter anatomy education across different stages of academic training and professional practice within the physical education domain. Participants were categorized according to their primary professional orientation within physical education-related fields to allow descriptive comparisons of anatomy education experiences.

Participants aged 19 years and older were recruited through university-based distribution channels and professional networks, including elite sports teams. A total of 838 questionnaires were distributed, of which 108 responses were excluded due to incomplete participation or uniform response patterns. The remaining 730 responses were included in the final analysis.

Participants were categorized into four groups based on their self-reported primary career orientation or professional direction: professional athletes, education sector, therapy and rehabilitation, and others. This grouping was used to support exploratory comparisons of perceived anatomy education experiences across roles commonly assumed by physical education majors in South Korea. Detailed demographic characteristics are presented in Table 1.

Ethical approval

The study was conducted in accordance with the guidelines of the Declaration of Helsinki and was approved by the Air Force Aerospace Medical Center Institutional Bioethics Committee (ASMC-23-IRB-012; date of approval: 26/01/24).

Questionnaire organization and procedures

The survey instrument was developed by adapting and reconstructing 30 items based on previous studies examining perceptions of educational sufficiency and relevance in anatomy education. The questionnaire was designed to capture participants' perceived experiences with anatomy education rather than to objectively evaluate formal curricula.

Survey items addressed three main domains: (1) demographic and educational background, (2) perceived application and relevance of anatomical knowledge in academic or professional contexts, and (3) perceived adequacy of instructional content and teaching methods in anatomy education. The questionnaire was organized into three corresponding sections: general participant characteristics, field application of anatomical knowledge, and perceptions of anatomy education content and instructional methods.

Responses to perception-based items were recorded using a 5-point Likert scale (1 = not used, 2 = rarely used, 3 = moderately used, 4 = frequently used, and 5 = very frequently used).

Participants were provided with written study information and confirmed voluntary participation prior to completing the survey. All responses were collected anonymously, and data was used exclusively for research purposes.

TABLE 1 Demographic characteristics of participants: Summary of participants' demographics including age, gender, education level, current status, and career experience.

Variables		n	%
Age	<20	152	20.8
	21–23	179	24.5
	24–27	99	13.6
	28–31	79	10.8
	32–35	101	13.8
	36–38	56	7.7
	>39	64	8.8
Sex	Male	558	76.4
	Female	172	23.6
Education level	High School Diploma	335	45.9
	Associate Degree	18	2.5
	Bachelor's Degree	256	35
	Master's Degree	88	12.1
	Doctoral Degree	33	4.5
College admission date	<2000	71	9.7
	2001–2005	50	6.8
	2006–2010	85	11.6
	2011–2015	102	14.0
	2016–2020	124	17.0
	>2020	298	40.8
Current status	University Student	112	15.3
	Graduate Student	40	5.5
	Professional Athlete	274	37.5
	Education	163	22.3
	Rehabilitation	92	12.6
	Other	49	6.7
Career experience	1–3	135	18.5
	4–6	155	21.2
	7–10	179	24.5
	11–14	128	17.5
	15–18	51	7.0
	>18	82	11.2
Certification	<2	663	90.8
	3–5	65	8.9
	>6	2	0.3
Total		730	100

Validity and reliability of the survey

The questionnaire was developed based on a review of previous studies on anatomy education and professional training contexts, with additional items constructed by the authors to reflect the characteristics of physical education-related professional fields in South Korea.^{10,14} Content validity of the questionnaire was assessed through a three-round Delphi process involving experts in

gross anatomy, exercise physiology, and training methodology. A preliminary pilot test was conducted with approximately 40 trainees to evaluate item clarity and response consistency.

Reliability of the survey instrument was assessed using test-retest reliability analysis based on Pearson correlation coefficients, rather than internal consistency measures such as Cronbach's alpha, as the questionnaire focused on perception-based constructs. Correlation coefficients ranged from $r=0.82$ to 0.94 across survey domains, indicating high stability and acceptable reliability of the instrument.

Data processing

Data were analyzed using SPSS WIN version 24.0 (IBM Corp., Armonk, NY, USA). Descriptive statistics and frequency analyses were used to summarize participant characteristics and response distributions.

For Likert-scale items, mean values and standard deviations were calculated to support descriptive interpretation and group-level comparison. While Likert scales are ordinal in nature, it is a widely accepted practice in survey-based research to treat them as interval-level data when items are aggregated or used in group comparisons. This approach facilitates parametric analyses and has been employed in numerous prior studies.

One-way analysis of variance (ANOVA) was conducted for exploration comparisons of perception scores across participant groups, followed by Tukey's post-hoc test where appropriate. Statistical significance was set at $p < 0.05$.

RESULTS

Demographic characteristics of the participants

A total of 730 participants majoring in or working in physical education-related fields were included in the analysis. Demographic characteristics are summarized in Table 1. Males comprised 76.4% of the sample, and females accounted for 23.6%. Educational attainment included high school diploma (45.9%), bachelor's degree (35.0%), master's degree (12.1%), and doctoral degree (4.5%). Participants represented a wide age distribution, ranging from under 20 years to over 39 years, with the largest proportion in the 21–23 age group (24.5%).

Participants reported diverse professional orientations, including professional athletes (37.5%), education sector (22.3%), undergraduate students (15.3%), therapy and rehabilitation (12.6%), and graduate students (5.5%). Reported career experience ranged from 1–3 years (18.5%) to more than 18 years (11.2%).

Participants' perception of their anatomy education

Participants' perceptions of anatomy education are presented in Table 2 and Figure 1. Responses were analyzed for the overall

TABLE 2 Participants' perceptions of anatomy education.

Content	Total	U student	G student	Athlete	Education	Rehabilitation	Other	F	p
Choose a response to the following statements on a scale of 1–5									
If you self-evaluate your level of anatomy knowledge?	3.40 ± 1.09	3.96 ± 0.95	3.38 ± 0.74	3.26 ± 1.28	3.40 ± 0.93	2.95 ± 0.87	3.69 ± 0.91	11.359	<0.001
Do you agree on the need for anatomy knowledge in performing exercise?	1.67 ± 0.74	1.71 ± 0.80	1.18 ± 0.38	2.04 ± 0.79	1.64 ± 0.55	1.10 ± 0.29	1.10 ± 0.31	43.663	<0.001
Do you think anatomy knowledge is necessary for improving exercise skills and performing tasks?	1.77 ± 0.75	1.93 ± 0.81	1.70 ± 0.75	2.09 ± 0.75	1.69 ± 0.63	1.13 ± 0.33	1.18 ± 0.39	37.525	<0.001
Do you use anatomy knowledge in the field of practice?	2.55 ± 0.95	2.70 ± 1.09	2.68 ± 0.97	2.62 ± 0.97	2.66 ± 0.95	2.05 ± 0.76	2.24 ± 0.90	7.742	<0.001

Note: Overview of participants' self-assessed anatomy knowledge, its necessity for performance, and application in practice across different groups. Scale: 1 = Very Unnecessary, 2 = Unnecessary, 3 = Neutral, 4 = Necessary, 5 = Very Necessary. U student, university student; G student, graduate student.

physical education–related sample and compared across participant groups reflecting different professional orientations within the physical education domain (e.g., professional athletes, education sector, and therapy and rehabilitation).

Self-assessed anatomy knowledge was rated at a mean score of 3.40 out of 5, with significant differences observed among participant groups ($p < 0.001$).

Participants reported high perceived importance of anatomical knowledge for performance- and practice-related purposes within physical education–related fields. The perceived necessity of anatomical knowledge for athletic performance showed a mean score of 1.67, with significant differences across participant groups ($p < 0.001$). The perceived importance of anatomical knowledge for enhancing job performance within physical education–related fields showed a mean score of 1.77, with significant group differences ($p < 0.001$); with the lowest scores observed among participants in therapy and rehabilitation.

In contrast, the reported application of anatomical knowledge in practice was moderate (mean score: 2.55), and significant differences among participant groups were observed ($p < 0.001$).

Overall, across perception items related to necessity, job performance, and practical application, responses varied significantly by professional orientation within the physical education domain, indicating heterogeneity in perceived relevance and use of anatomical knowledge across physical education–related roles.

Purposes and expected applications of anatomical knowledge

Figure 2 illustrates participants' reported purposes for acquiring anatomical knowledge and the areas in which they perceived potential benefits. More than 450 participants indicated that anatomical knowledge contributed to improvements in physical performance and educational capability. Over 400 participants reported perceived benefits related to injury treatment and prevention.

The most frequently reported purposes for acquiring anatomical knowledge included its application in educational settings (over 450 participants) and the development of practical techniques and methods used in the field (over 350 participants). Injury recovery was also frequently cited by more than 400 participants, while approximately 250 participants associated anatomical knowledge with athletic performance improvement. Certification-related purposes were reported by more than 100 participants.

Costs and satisfaction of extramural anatomy education

Costs and satisfaction associated with anatomy education obtained outside university settings are summarized in Table 3. Reported education sources included national institutions (13.4%), private associations (36.2%), personal providers (27.6%), and peer-based study groups (18.8%), with significant differences in cost distributions ($p < 0.001$).

Regarding expenditure, 55.2% of participants reported spending less than \$299, whereas 33.7% reported expenditure exceeding \$900. Cost distributions varied significantly across participant groups ($p < 0.001$), with higher expenditures more frequently reported among participants in the education and therapy sectors.

Perceived satisfaction differed according to expenditure level. Among participants spending less than \$599, higher satisfaction with university-based education was reported by 37.8% of respondents, while 33.8% reported similar satisfaction between university-based and external education. In contrast, among participants spending more than \$600, 69.7% reported higher satisfaction with external anatomy education. One-way analysis of variance confirmed significant differences in satisfaction patterns across participant groups ($p < 0.001$).

Status of anatomy education methods in the physical education field

Reported instructional methods used in university and external anatomy education are presented in Figure 3. University-based anatomy education was predominantly theoretical, as reported by 82.8% of participants, followed by palpation-based practice (7.7%), use of research literature (5.7%), and models or 3D imaging programs (3.9%). No participants reported exposure to cadaver-based instruction within university programs (Figure 3A).

In contrast, external anatomy education settings more frequently incorporated practical approaches. Theoretical instruction was reported by 51.2% of participants, while cadaver-based training was reported by 37.8%, and model- or 3D-based instruction by 9.4% (Figure 3B). When asked to identify the most effective anatomy education method, participants most frequently selected cadaver-based practical training (48.1%), followed by theoretical instruction (24.8%) and 3D imaging programs (18.4%) (Figure 3C).

DISCUSSION

Sports have transitioned from a niche activity to an integral part of daily life, a trend that is expected to accelerate. Physical education majors play a pivotal role in recognizing and teaching the importance of correct and effective exercises. They should acquire credible qualifications through systematic education and contribute to public health and well-being. Teaching anatomy fosters a whole-of-person approach, which is vital for training healthcare professionals and ensuring safe and effective practice.^{15–18} Therefore, understanding and improving anatomical education among physical education majors is crucial. This is particularly relevant in South Korea, where physical education programs often serve as a common educational pathway for multiple professional trajectories, including elite athletes, physical education teachers, and exercise science professionals. As a result, individuals from diverse professional orientations may share

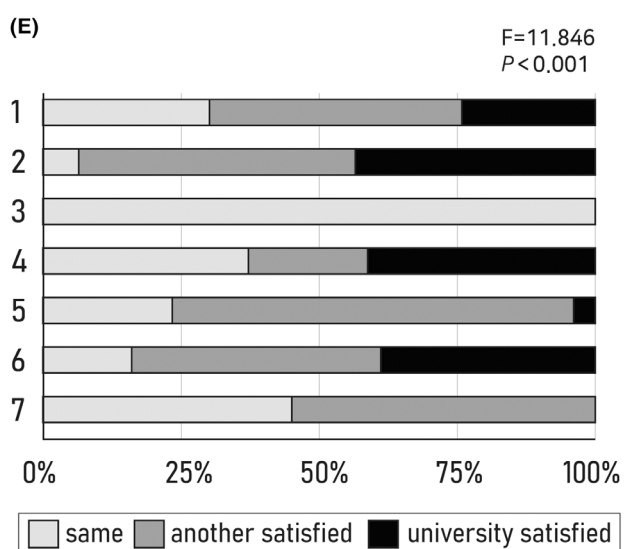
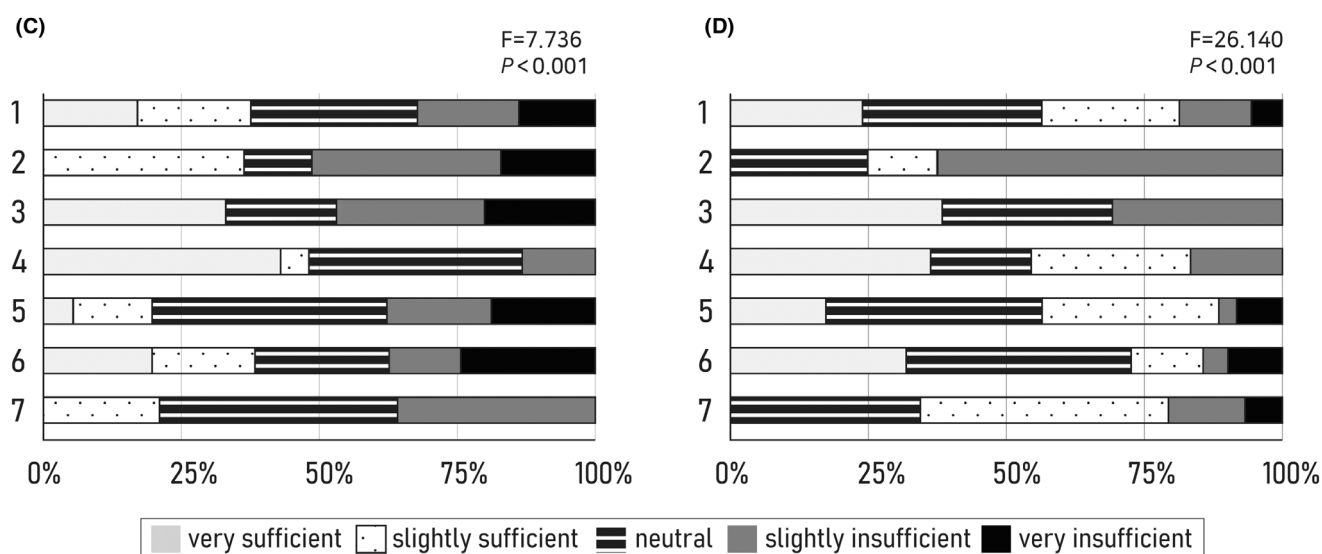
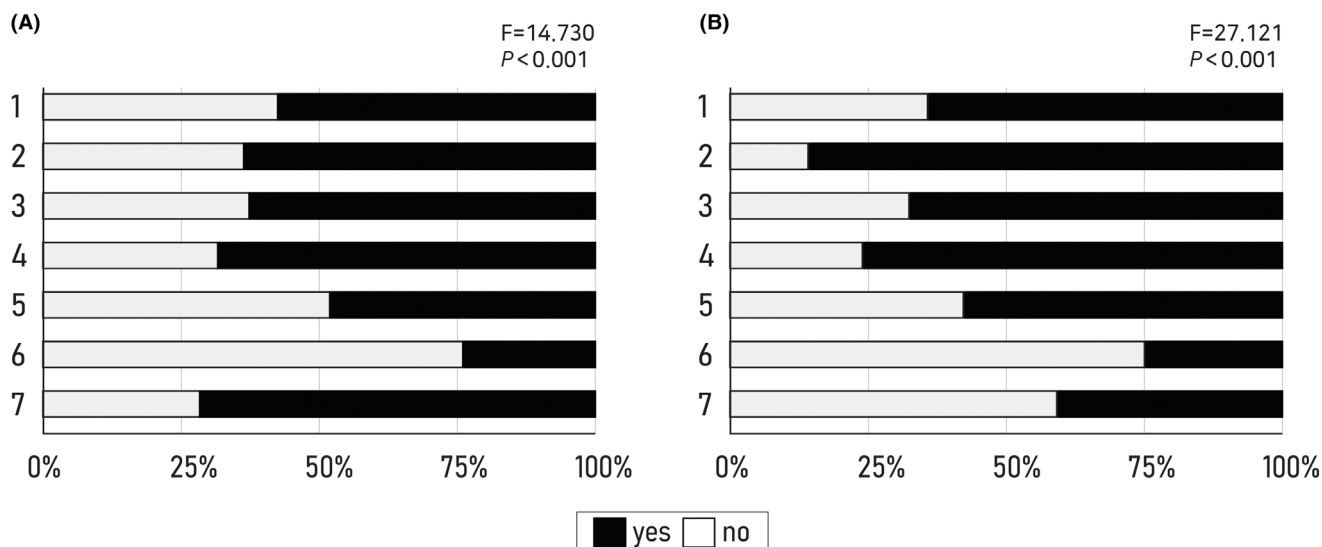


FIGURE 1 Participants' self-assessed anatomy knowledge levels: The distribution of participants' self-assessed levels of anatomy knowledge across various career groups, was measured on a 5-point Likert scale: (A) Have you ever taken an anatomy course in college?; (B) Have you ever taken anatomy courses in other institutions?; (C) What was the satisfaction level of education when you completed anatomy education at a university?; (D) What was the satisfaction level of education when you completed anatomy education at another institution?; (E) Which education was more satisfactory, university education or other institution?; 1, Total; 2, U student; 3, G student; 4, Athlete; 5, Education; 6, Rehabilitation; 7, Other.

similar educational backgrounds within the same university-based physical education departments.

The existing literature highlights limited research on the adequacy of anatomical knowledge in health profession programs and its impact on clinical practice.⁵ Anatomical knowledge is indispensable for all professions involving the human body, facilitating inter-professional trust and collaboration.¹⁴ To ensure safe training, it is important to assess whether a university-level anatomy education meets practical needs. Ongoing debates address the scope and methods of teaching anatomy and the appropriate stage in one's career to learn it.^{14,19,20} Although opinions differ outside the medical field, anatomy remains foundational in training clinicians, healthcare professionals, and scientists.²¹⁻²³

In South Korea, physical education majors play diverse roles in promoting health, from training athletes and the public to working with infants, older adults, and individuals with disabilities. Similar challenges in integrating anatomy education into non-medical curricula have been reported across different health science and allied health training contexts, highlighting the need for broader international efforts to address these gaps. Currently, the only government-affiliated certifications related to physical education in Korea are the Sports Instructor and Health Exercise Manager qualifications issued by the Korea Sports Promotion Foundation (KSPO). Health exercise management involves professionally guiding exercise methods tailored to an individual's physical characteristics. In addition to Sports Instructor certification, professionals must obtain a Health Exercise Manager qualification. While these roles require a comprehensive understanding of anatomy, exercise methods, and health management, university programs often lack detailed curricula, particularly in anatomy education. Consequently, practitioners often seek additional certification from private organizations or international programs to supplement their knowledge. The gap between formal education and the practical demands encountered in professional roles highlights perceived discrepancies in anatomy education among physical education majors, as reported by participants.

The physical education curriculum was designed to enhance public health and promote professionalism in health-related fields. Although participants recognized the potential of university-based physical education programs, they also reported limitations in how anatomy education was delivered within current institutional settings. Roles such as Athletic Trainer (AT) or chiropractor, which are well established in other countries, are not yet formally recognized in Korea, although physical education majors often fulfill these functions. Universities can enhance their specialized departments and structured educational programs. Teaching anatomy to large groups

may be cost-effective but may not fully address specific professional needs.¹⁸ Consequently, students often have to spend considerable amounts of time and money on private and unverified programs to gain the skills necessary for their careers.

Our findings reveal significant cost variations in anatomy education, especially in the therapy and education sectors, where investments are often higher. Cost differences can affect access to quality education and create potential inequities in professional advancement. Higher satisfaction with external education among those spending more than \$600 suggests a link between costs and perceived quality. Emphasizing the importance of anatomy education is crucial and can be achieved by expanding lecture hours and increasing practical opportunities using diverse learning tools in physical education-related departments. To reduce the cost of external education, governments and universities should consider establishing support programs. The need for anatomy instruction suited to non-medical disciplines is growing; therefore, these findings are not only relevant in South Korea but also around the world. For instance, the challenges faced by South Korean physical education professionals mirror those in other countries with similar gaps in structured qualifications and curricula. Addressing these shared challenges through international collaborations and best-practice exchanges could significantly enhance the quality of anatomy education worldwide. In the long term, introducing systematically subdivided, nationally certified qualifications can help train professionals effectively.

Participants emphasized anatomical knowledge as critical for their roles, especially in therapy and rehabilitation, underscoring its importance in professional practice. However, this perceived necessity was not explicitly reflected in the structure or learning objectives of the current physical education curricula, indicating a misalignment between educational content and professional demands. Most participants believed that their anatomical knowledge significantly enhanced their professional skills. This highlights its practical benefits in various areas such as educational improvement, technique development, and injury recovery. These findings underscore the vital need for anatomy education to support diverse objectives and ensure that professionals are equipped with the skills necessary to excel in their field.

Innovative educational methods, such as 3D visualization, interactive learning approaches, and web-based educational tools, are increasingly introduced in anatomy and health science education to enhance student engagement and understanding.^{5,24} However, physical education curriculum improvements in physical education remain limited. Our study found that external institutions offered more diverse educational methods than universities, leading to

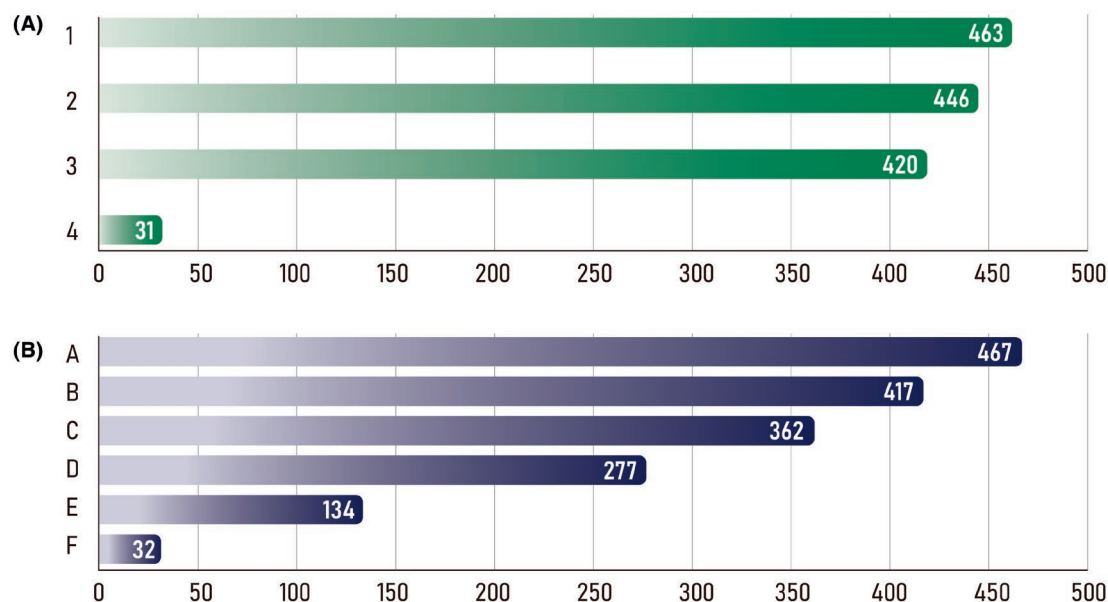


FIGURE 2 Expected improvements and purposes of anatomy knowledge: (A) What can anatomy knowledge improve?: a, athletic ability; b, educational ability; c, treatment and prescription ability; d, others; (B) What do you think anatomy knowledge is needed for?: a, developing practical skills and methods used in the field; b, Application in the education field; c, obtaining a certificate; d, prevention of injury; e, performance improvement; f, others.

higher participant satisfaction. Although cadaver-based training, deemed the most effective by the participants, was not offered by universities, 37.8% of the external program participants experienced it, highlighting the importance of the curriculum in choosing educational institutions. There is a disconnect between current educational methods and student needs, as indicated by the preference for cadaver-based and hands-on training. Previous research indicates that anatomy teaching methods impact knowledge retention, with body regions not taught in laboratories resulting in a lower understanding.¹¹ The lack of diversity in teaching methods may have contributed to stagnant perceptions over time. To address this issue, universities should integrate practical approaches and diverse learning tools to foster active learning and boost student satisfaction. The current pedagogical goal is a multimodal educational approach involving active learning applied to the anatomical sciences and integrated curricula with competency assessments is the current pedagogical goal.^{25,26}

Anatomy is not included as a dedicated test subject in any Sports Instructor certification category, and although the Health Exercise Manager qualification addresses health and fitness evaluation and functional anatomy, participants reported that anatomy education within university-level physical education programs was often perceived as insufficiently detailed for their professional needs. From a broader educational perspective, robust anatomy education should cover the microscopic to gross levels to effectively link structures. Practitioners need a strong foundation in surface and living anatomy for clinical examinations and procedures.^{27,28} Lack of anatomical knowledge can hinder clinical skills, with studies indicating challenges in knowledge transfer and retention.⁸

Anatomy is crucial for health professionals and exercise scientists to enhance their ability to interpret anatomical structures when aligned with other biomedical disciplines such as physiology.²⁹ However, there is growing concern over the loss of anatomical knowledge in medical and allied health programs, including physical therapy, kinesiology, and chiropractic.^{30–32} Debates have highlighted the decline in teaching time and traditional methods, reduction in curriculum scope, and a shortage of qualified anatomists, which have led to decreased exposure to anatomy in integrated curricula.^{6–9} This decline has raised concerns about the quality of services provided. In response, the need for anatomy and its relevance have emerged.³³ The Anatomical Society of Great Britain and Ireland (ASGBI) and the American Association of Anatomists (AAA) emphasize training more anatomists to address this decline.³³ Their initiatives aim to recruit high-quality individuals to enhance public understanding and knowledge.³⁴

Students often find anatomy challenging because of limited instructional time and opportunities.¹³ Participants reported a greater emphasis on theoretical instruction in university settings compared with the more practice-oriented approaches experienced in private institutions. Addressing these issues connects the findings to broader educational and professional contexts and suggests ways to improve anatomical education.

This study aimed to examine how anatomy education is experienced and perceived by individuals engaged in physical education-related fields in South Korea. Similar gaps between anatomical education and practical demands have been reported in international chiropractic programs, suggesting this issue extends beyond Korea.¹⁸ By identifying patterns of perceived misalignment between

TABLE 3 Costs and satisfaction with external anatomy education.

Variables			n	%	F	p
Other institution	National education		57	13.4	7.387	<0.001
	An incorporated corporation		154	36.2		
	Personal education		117	27.6		
	Peer study		80	18.8		
	Other		17	4		
Other institution educational expenses	<\$299		144	55.2	23.411	<0.001
	\$300–599		9	3.4		
	\$600–899		11	4.2		
	>\$900		88	33.7		
Investment cost by identity	University Student	<\$599	14	87.5	15.724	<0.001
		>\$600	2	12.5		
	Graduate Student	<\$599	13	100		
		>\$600	0	0		
	Professional Athlete	<\$599	50	89.3		
		>\$600	6	10.7		
	Education	<\$599	19	27.6		
		>\$600	50	72.4		
	Rehabilitation	<\$599	30	43.5		
		>\$600	39	56.5		
	Other	<\$599	22	75.9		
		>\$600	2	24.1		
Education satisfaction for cost	<\$599	Same	50	33.8	24.741	<0.001
		Other Institution	42	28.4		
		University	56	37.8		
	>\$600	Same	25	22.9		
		Other Institution	76	69.7		
		University	8	7.4		

Note: Details on the types and costs of external anatomy education and satisfaction levels based on the amount spent.

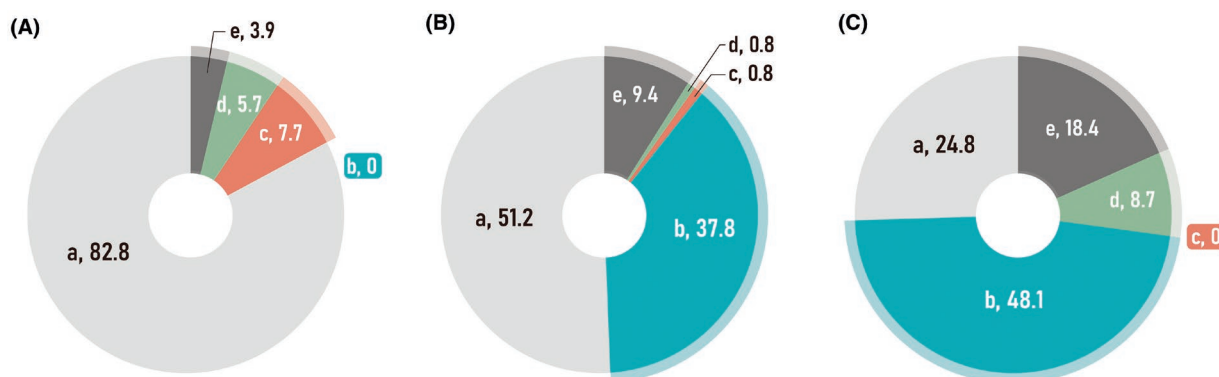


FIGURE 3 Methods of anatomy education used in universities and external institutions: (A) University education methods: a, theory lectures; b, practice; c, the base of tactile practice; d, utilization of latest research trends and papers; e, models and 3D video programs; (B) Other institutions education methods: a, theory lecture; b, cadaver practice; c, the base of tactile practice; d, utilization of latest research trends and papers; e, models and 3D video programs; (C) How to think effective anatomy education methods: a, theory lecture; b, cadaver practice; c, the base of tactile practice; d, utilization of latest research trends and papers; e, models and 3D video programs.

university-based anatomy education and the practical demands encountered in professional settings, this study contributes empirical evidence on how current anatomy education is experienced within physical education-related fields in South Korea. Rather than evaluating or prescribing curricular reform, the findings clarify areas in which participants reported limited exposure to applied and cadaver-based anatomy training, despite recognizing its relevance to their professional roles. In this respect, the present results provide a data-driven foundation for future academic and institutional discussions regarding how anatomy education in non-medical disciplines may be structured to better reflect the realities of professional practice in a wellness-centered context.

This study has several limitations. First, the results are based on self-reported responses, which may be influenced by individual interpretation, recall bias, or response style. Second, as the study was conducted exclusively in South Korea, the findings may not be directly generalizable to other countries with different educational systems. Third, the survey focused primarily on perceptions and curricular experiences, rather than objective assessments or instructor perspectives. Future research may benefit from incorporating qualitative interviews, longitudinal data, or cross-national comparisons to complement and expand upon these findings. Future research may explore applied anatomy modules, virtual learning tools, and multimodal instructional approaches to further examine how anatomy education can be aligned with professional practice. Because the primary aim of this study was to explore professionals' perceptions of anatomy education within the context of physical education in South Korea, the discussion focuses on interpreting these experiences rather than providing a comprehensive comparative analysis of international curricula.

CONCLUSION

This study examined how anatomy education is experienced and perceived by individuals engaged in physical education-related fields in South Korea. The findings demonstrate consistent discrepancies between university-based anatomy education and the practical demands encountered across diverse professional contexts, particularly in relation to applied and cadaver-based learning experiences.

Rather than directly evaluating or reforming existing curricula, this study clarifies how current educational structures are perceived by those who have progressed from academic training into professional practice. By documenting these perceptions within the specific context of South Korean physical education, the present findings provide an empirical basis for understanding current educational challenges and identifying areas that may require further academic and institutional consideration as the roles of physical education professionals continue to expand in a wellness-centered era.

AUTHOR CONTRIBUTIONS

Kyu-Lim Lee: Conceptualization; funding acquisition; data curation; writing – original draft; writing – review and editing. **Jun-Young Sung:** Data curation; writing – original draft; writing – review and

editing; methodology. **Hee-Jin Kim:** Writing – review and editing; conceptualization.

ACKNOWLEDGMENTS

The authors thank Hye-Won Huh from Yonsei University College of Dentistry for assisting in the production of visual materials.

CONFLICT OF INTEREST STATEMENT

The authors declare that there is no conflict of interest regarding the publication of this article.

DATA AVAILABILITY STATEMENT

The datasets used and analyzed during the current study are available from the corresponding author upon reasonable request.

ETHICAL APPROVAL

The study was conducted in accordance with the guidelines of the Declaration of Helsinki and was approved by the Air Force Aerospace Medical Center Institution Bioethics Committee (ASMC-23-IRB-012; date of approval: 26/01/24).

INFORMED CONSENT STATEMENT

Informed consent was obtained from all subjects involved in the study.

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REFERENCES

1. Cuppett MM. Self-perceived continuing education needs of certified athletic trainers. *J Athl Train*. 2001;36(4):388–95.
2. Young JQ, van Dijk SM, O'Sullivan PS, Custers EJ, Irby DM, Ten Cate O. Influence of learner knowledge and case complexity on handover accuracy and cognitive load: results from a simulation study. *Med Educ*. 2016;50(9):969–78.
3. Moore KL, Dalley AF, Agur AMR. Clinically oriented anatomy. 7th ed. Philadelphia: Wolters Kluwer; 2013.
4. Viana RB, Campos MH, Santos DDAT, Xavier ICM, Vancini RL, Andrade MS, et al. Improving academic performance of sport and exercise science undergraduate students in gross anatomy using a near-peer teaching program. *Anat Sci Educ*. 2019;12(1):74–81.
5. Rabattu PY, Debarnot U, Hoyek N. Exploring the impact of interactive movement-based anatomy learning in real classroom setting among kinesiology students. *Anat Sci Educ*. 2023;16(1):148–56.
6. Moxham B, McHanwell S, Plaisant O, Pais D. A core syllabus for the teaching of neuroanatomy to medical students. *Clin Anat*. 2015;28(6):706–16.
7. Craig S, Tait N, Boers D, McAndrew D. Review of anatomy education in Australian and New Zealand medical schools. *ANZ J Surg*. 2010;80(4):212–6.
8. Yammine K. The current status of anatomy knowledge: where are we now? Where do we need to go and how do we get there? *Teach Learn Med*. 2014;26(2):184–8.
9. Drake RL, McBride JM, Pawlina W. An update on the status of anatomical sciences education in United States medical schools. *Anat Sci Educ*. 2014;7(4):321–5.



10. Kim H, Lee S, Kim H. Curriculum of gross anatomy education in Korean dental hygiene programs: perceptions and needs. *Anat Sci Educ.* 2021;14(3):304–13.
11. Simons AC, McHugh KM, Appling S, Harris SL, Burgoon JM. Instructional approaches: anatomy education of physical therapists. *Anat Sci Educ.* 2022;15:102–14.
12. Manyama M, Mshana SE, Kabangira R, Konje E. Shortage of faculty in medical schools in Tanzania: a case study at the Catholic University of Health and Allied Health Sciences. *Afr J Health Prof Educ.* 2013;5(2):95–7.
13. Manyama M, Stafford R, Mazyala E, Lukania A, Magele N, Kidenya BR, et al. Improving gross anatomy learning using reciprocal peer teaching. *BMC Med Educ.* 2016;16:95.
14. Giuriato R, Štrkalj G, Meyer AJ, Pather N. Anatomical sciences in chiropractic education: a survey of chiropractic programs in Australia. *Anat Sci Educ.* 2020;13(1):37–47.
15. Jones DG. Bioethical aspects of commemorations and memorials. In: Štrkalj G, Pather N, editors. *Commemorations and memorials: exploring the human face of anatomy.* Singapore: World Scientific; 2017. p. 15–25.
16. Štrkalj G, Pather N, editors. *Commemorations and memorials: exploring the human face of anatomy.* Singapore: World Scientific; 2017.
17. Patel KM, Moxham BJ. The relationships between learning outcomes and methods of teaching anatomy as perceived by professional anatomists. *Clin Anat.* 2008;21(2):182–9.
18. Moxham B. Symposium on anatomical education. *J Anat.* 2014;224(3):255.
19. Collins J. Modern approaches to teaching and learning anatomy. *BMJ.* 2008;337:a1310.
20. Azer SA, Eizenberg N. Do we need dissection in an integrated problem-based learning medical course? Perceptions of first- and second-year students. *Surg Radiol Anat.* 2007;29(2):173–80.
21. Winklemann A. Anatomical dissection as a teaching method in medical school: a review of the evidence. *Med Educ.* 2006;41(1):15–22.
22. McCuskey RS, Carmichael SW, Kirch DG. The importance of anatomy in health professions education and the shortage of qualified educators. *Acad Med.* 2005;80(4):349–51.
23. Older J. Anatomy: a must for teaching the next generation. *Surgeon.* 2004;2(2):79–90.
24. Estai M, Bunt S. Best teaching practices in anatomy education: a critical review. *Ann Anat.* 2016;208:151–7. <https://doi.org/10.1016/j.aanat.2016.02.010>
25. Johnson EO, Charchanti AV, Troupis TG. Modernization of an anatomy class: from conceptualization to implementation. A case for integrated multimodal-multidisciplinary teaching. *Anat Sci Educ.* 2012;5(6):354–66.
26. Drake RL. A retrospective and prospective look at medical education in the United States: trends shaping anatomical sciences education. *J Anat.* 2014;224(3):256–60.
27. Ganguly PK, Chan LK. Living anatomy in the 21st century: how far can we go? *South East Asian J Med Educ.* 2008;2(1):52–7.
28. Leonard RJ, Acland RD, Cahill DR, Casey MA, Ger R, Gilroy AM, et al. The clinical anatomy of several invasive procedures. *Clin Anat.* 1999;12(1):43–54.
29. Hartley RS, Smith GA, Rosenberg MJ. Anatomy integration: effective change or change of affect? *Anat Sci Educ.* 2018;11(5):536–46.
30. Anderson JC, Conley LK. Retention of anatomical detail. *J Phys Ther Educ.* 2000;14(2):44–7.
31. Wagner EA. Using a kinesthetic learning strategy to engage nursing student thinking, enhance retention, and improve critical thinking. *J Nurs Educ.* 2014;53(6):348–51.
32. Štrkalj G, Schroder T, Pather N, Solyali V. A preliminary assessment of the fifth-year chiropractic students' knowledge of anatomy. *J Altern Complement Med.* 2011;17(1):63–6.
33. Fraher JP, Evans DJ. Training tomorrow's anatomists today: a partnership approach. *Anat Sci Educ.* 2009;2(3):119–25.
34. Evans DJR. Designing patient-focused information: an opportunity for communicating anatomically related information. *Anat Sci Educ.* 2008;1:41–5.

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How to cite this article: Lee K-L, Sung J-Y, Kim H-J. Anatomy education experiences of physical education professionals in a wellness-centered era: Evidence from South Korea. *Anat Sci Educ.* 2026;00:1–11. <https://doi.org/10.1002/ase.70283>