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Original Article

Association between health behaviors and tooth fracture incidence among Korean adolescents : findings from the 20th Korea Youth Risk Behavior Survey

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ABSTRACT

Objectives: This study aimed to clarify the risk factors for tooth fracture among Korean adolescents using data from the 20th Korea Youth Risk Behavior Survey (2024). **Methods:** A total of 54,648 adolescents were included in this study. Data were analyzed using IBM SPSS Statistics 25.0. **Results:** The prevalence of tooth fracture was higher among male students; high school students; and those with lower academic achievement, lower economic status, unhealthy status, and insufficient recovery from sleep. The risk of tooth fracture increased with greater participation in physical activities such as ≥60 min of physical activity per week, vigorous-intensity physical activity, and more frequent muscle-strengthening exercises. Additionally, risky behaviors such as not wearing seat belts or helmets; history of injury or hospital treatment; lack of safety education; and history of violence, binge drinking, or drug use significantly increased the likelihood of tooth fracture. **Conclusions:** Tooth fractures in adolescents are influenced by multiple factors rather than a single cause. The findings suggest that prevention strategies should comprehensively address physical activity management, enhance safety awareness, and reduce risky behaviors.

Key Words: Adolescents, Injury, Physical activity, Risky behaviors, Safety, Tooth fracture

Introduction

Adolescence constitutes a pivotal developmental stage marked by rapid physical and cognitive growth, during which health-related behaviors play a crucial role in determining long-term health outcomes [1]. Physical activity plays a vital role in growth and development by promoting improvements in cardiorespiratory endurance, muscular strength, flexibility, and overall physical health. However, increased participation in physical activity is associated with a greater risk of injury. In particular, dental injuries sustained during sports activities pose not only aesthetic and functional challenges but also require substantial time and financial investment for treatment, thereby negatively affecting quality of life [2]. In recent years, the rate of physical activity participation among Korean adolescents has increased; simultaneously, there has been a rise in trauma incidence linked to insufficient safety awareness, including factors such as inadequate exercise environments and the lack of protective equipment use [2]. tooth fracture during adolescence most frequently occurs in school, recreational, and transportation settings and is closely related to physical activity [2,3]. Although oral and dental fractures are common [4,5], their severity is often underestimated, and preventive measures remain insufficient. Previous studies have primarily focused on the relationship between adolescents' physical activity and general trauma experiences [3–18]; however, comprehensive analyses investigating how specific characteristics of physical activity-such as frequency and intensity-as well as safety awareness affect the occurrence of tooth fracture are limited.

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Previous studies have reported that the prevalence of tooth fracture among middle and high school students ranges from approximately 9% to 12%, with a higher incidence observed in male students, individuals engaging in elevated levels of physical activity, and those participating in sports clubs [3]. Research has demonstrated a positive correlation between increased safety awareness among adolescents and the adoption of preventive behaviors against dental injuries, including the use of mouthguards and avoidance of hazardous activities [4]. On an international level, investigations into tooth fracture during adolescence have been relatively extensive. The global incidence of tooth fracture in this population is estimated to range from 15% to 20%, with risk factors encompassing heightened physical activity levels [5]. Importantly, awareness regarding appropriate emergency management following tooth fracture remains low, which may negatively impact the prognosis of affected teeth [6]. The use of mouthguards has been shown to reduce the risk of dental injury by more than 60%, highlighting the critical importance of protective equipment during sports participation [7]. Moreover, evidence indicates that adolescents who have received safety education exhibit lower rates of tooth fracture and demonstrate more appropriate emergency responses post-injury compared to their non-educated peers [8]. The occurrence of tooth fracture is significantly associated with intense physical activity, engagement in health risk behaviors, and mental health variables, and is also linked to safety awareness factors such as prior safety education, experiences of violence, and the use of seat belts and helmets [9,10]. tooth fracture arises from multiple factors, including traffic accidents, assaults, and sports-related activities, and is notably prevalent during adolescence-a developmental stage marked by increased engagement in walking, running, and other physical activities [11,16]. Although previous studies have explored adolescents' experiences with tooth fracture and certain risk factors individually, there remains a lack of comprehensive analyses that simultaneously consider physical activity, injury history, and safety awareness. Furthermore, existing domestic research is often limited by small sample sizes or confined to specific regions, highlighting the need for large-scale, nationwide investigations from a public health perspective. While the Korea National Health and Nutrition Examination Survey (KNHANES) provides extensive clinical and examination data, the Korea Youth Risk Behavior Survey (KYRBS) is better suited for integrated analyses involving health behaviors and environmental factors due to its systematic annual collection of large, representative samples. Therefore, the KYRBS offers an optimal framework for examining the relationships between tooth fracture experiences and multiple determinants. Accordingly, the present study aims to comprehensively assess the impact of physical activity, injury experience, safety awareness, and risk behaviors on tooth fracture by utilizing representative data from the 20th Korea Youth Risk Behavior Survey (2024) [12].

The specific and detailed objectives of this study are delineated as follows. This study primarily aims to characterize adolescents' physical activity patterns, injury experiences, safety awareness, and engagement in risk behaviors. Additionally, it seeks to examine variations in physical activity levels, injury occurrences, safety awareness, risk behaviors, and the incidence of tooth fracture within this population. Furthermore, the research intends to analyze the interrelationships among physical activity, injury experiences, safety awareness, risk behaviors, and tooth fracture. Through these objectives, the study aspires to contribute to the development of systematic and effective preventive strategies to improve oral health among adolescents and to provide empirical evidence to inform the enhancement of safety management programs in educational institutions and local communities.

Methods

1. Subjects

The 20th Youth Health Behavior Survey (2024) represents a nationally authorized statistical study (approval number 117058) aimed at evaluating the current status and trends of health behaviors among Korean adolescents, utilizing publicly accessible, de-identified raw data [9]. The secondary analysis of this anonymized and publicly available national dataset involves the use of disclosed information without the collection or recording of personally identifiable data, thereby exempting the study from review by the affiliated institution's Institutional Review Board. The survey included a total of 800 educational institutions, consisting of 400

middle schools and 400 high schools. Of these, 799 schools (400 middle schools and 399 high schools) participated, resulting in a total sample of 54,653 students and a student participation rate of 94.9%. A stratified cluster sampling method was employed, with schools as the primary sampling units and classes as the secondary sampling units. In the primary sampling stage, schools were selected within strata using permanent random number sampling. Subsequently, one class per grade was randomly selected from each sampled school during the secondary sampling stage. All students within the selected classes were surveyed, except those with prolonged absences, special needs students unable to participate independently, and students with literacy impairments [12]. The research survey was conducted following the training of the teacher responsible for survey support at the selected sample schools. This teacher entered information regarding the characteristics of each class, including the number of male and female students, into the survey system for all classes within the sample schools. Based on this data, sample classes were identified, and survey administrators scheduled the survey dates and times within the system. The survey was administered using mobile devices (such as tablet PCs and smartphones), with one device allocated per student in the selected classes. Survey administrators provided each student with an instruction sheet detailing the survey's purpose and participation procedures. Students accessed the survey system using a participation number printed on their instruction sheet to complete the survey. The survey was conducted during class hours in accordance with established guidelines. Upon completion, survey administrators recorded the conditions present during the survey in the system; this information was subsequently used in the weighting calculations. Data collection took place between June and July 2024, involving a total of 54,653 participants. After excluding outliers, incomplete responses, and non-responses, the final analysis included data from 54,648 respondents.

2. Study instruments

The Youth Health Behavior Survey consisted of 106 items across 15 distinct domains. For the present analysis, a subset of questions was selected, comprising six items related to general characteristics, three items addressing risk behaviors, three items concerning physical activity, and eight items focused on injury prevention. The general characteristics included six variables: gender (male, female), school level (middle school, high school), academic performance (categorized as high, average, or low), economic status (good, average, poor), health status (healthy, average, unhealthy), and sleep recovery (sufficient, insufficient). Academic performance was reclassified into three categories: 'high' (combining very high and high), 'average,' and 'low' (combining low and very low). The risk behavior variables encompassed two items assessing experiences of hospital treatment due to violence and episodes of heavy intoxication. Hospital treatment due to violence was dichotomized as 'none' (0 occurrences) and 'yes' (one or more occurrences, up to six or more). Furthermore, tooth fracture was assessed by asking respondents whether they had experienced a broken or chipped tooth resulting from sports activities or accidents within the previous 12 months. In this study, tooth fracture was specifically defined as tooth fractures, with the occurrence of such fractures referred to as tooth fracture. Physical activity was assessed using three indicators: the number of days per week with at least 60 minutes of physical activity, the number of days involving high-intensity physical activity, and the number of days dedicated to muscle-strengthening exercises. These variables were subsequently categorized into three groups: 0 days as 'none,' 1 to 3 days per week as '3 days or fewer per week,' and 4 to 7 days per week as '4 days or more per week.' Furthermore, eight variables related to injury and safety awareness were examined, including the use of seatbelts in passenger vehicles, the use of motorcycle helmets, the use of bicycle helmets, incidence of injury occurring at school, receipt of hospital treatment for injuries sustained at school, hospital treatment for injuries associated with the use of earphones or cellphones, and whether safety education regarding injury prevention was provided at school.

3. Data analysis

Data analysis was conducted using IBM SPSS program (ver. 25.0; IBM Corp., Armonk, NY, USA). To accommodate the complex sampling design of the Youth Behavior Survey, analyses incorporated sample weights, stratification, and clustering variables to

ensure representativeness. Descriptive frequency analyses were performed to characterize general demographics, risk behaviors, physical activity, injury and safety awareness, and experiences of tooth fracture. Differences among these variables were evaluated using complex sample cross-tabulation analyses. Additionally, complex sample logistic regression was utilized to identify risk factors associated with the occurrence of tooth fracture. Statistical significance was set at an alpha level of 0.05.

Results

1. Differences in tooth fracture according to general characteristics, physical activity, injury & safety, and risk behaviors

Differences in tooth fractures based on general characteristics, physical activity, injury and safety, and risk behaviors are presented in <Table 1>. The general characteristics showed statistically significant differences by gender (p<0.01), grade level (p<0.01), academic achievement (p<0.001), economic status (p<0.001), health status (p<0.001), and sleep recovery (p<0.001). Tooth fracture was found among male high school students with low academic achievement, low socioeconomic status, poor health, and inadequate sleep. Significant differences in risk behaviors were noted, especially regarding violence (p<0.001) and heavy intoxication (p<0.001). tooth fracture was strongly linked to exposure to violence and heavy intoxication.

Table 1. Differences in tooth fracture according to general characteristics, physical activity, injury & safety, and risk behaviors

Unit: N(weighed %) (N=54,648)

Variables	Division		Tooth fracture		p^*
			No	Yes	
General characteristics	Gender	Male	24,677(87.8)	3,413(12.2)	0.002
		Female	23,560(88.7)	2,998(11.3)	
	School grade	Middle school	22,673(88.7)	2,890(11.3)	0.004
		High school	25,564(87.9)	3,521(12.1)	
	Academic achievement	High	18,642(89.5)	2,196(10.5)	<0.001
		Middle	14,094(89.0)	1,748(11.0)	
		Low	15,501(86.3)	2,467(13.7)	
	Economic status	High	20,545(88.8)	2,598(11.2)	<0.001
		Middle	22,546(88.7)	2,885(11.3)	
		Low	5,146(84.7)	928(15.3)	
	Health level	Healthy	32,123(88.8)	4,070(11.2)	<0.001
		Normal	11,757(88.1)	1,594(11.9)	
		Unhealthy	4,357(85.4)	747(14.6)	
	Sleep recovery	Enough	25,705(88.9)	3,194(11.1)	<0.001
		Insufficient	22,532(87.5)	3,217(12.5)	
Risk behaviors	Violence therapy	No	47,088(88.4)	6,156(11.6)	<0.001
		Yes	1,149(81.8)	255(18.2)	
	Binge drinking	No	47,742(88.4)	6,275(11.6)	<0.001
		Yes	495(78.4)	136(21.6)	

*by complex samples chi-square test

2. Differences in tooth fracture according to general characteristics, physical activity, injury & safety, and risk behaviors

<Table 2> shows variations in physical activity levels, injury & safety, and tooth fracture. Significant differences were found in the

number of days per week with at least 60 minutes of physical activity (p<0.001), participation in high-intensity activities (p<0.001), and muscle-strengthening exercises (p<0.001). Tooth fracture was observed in students engaging in physical activities, high-intensity exercise, or strength training for at least 60 minutes on four or more days per week. Significant differences were found in injury and safety awareness regarding seatbelt use (p<0.001), motorcycle and bicycle helmet use (p<0.001), injury history (p<0.001), school-related injury occurrence (p<0.001), hospital treatment for school injuries (p<0.001), injuries linked to earphone or cell phone use (p<0.001), and participation in safety education programs (p<0.001). Among students who neglected seat belts as car passengers, failed to wear helmets on motorcycles or bicycles, suffered school injuries, or needed hospital treatment for school-related or earphone/cell phone-related injuries, tooth fracture was significantly more common in those lacking safety education.

Table 2. Differences in tooth fracture according to general characteristics, physical activity, injury & safety, and risk behaviors

Unit: N(weighed %) (N=54,648)

Variables	Division		Tooth fracture		p^*
			No	Yes	
Physical activity (weeks)	≥60-min physical exercise	No	14,714(89.9)	1,650(10.1)	<0.001
		≤3 days	21,253(88.0)	2,886(12.0)	
		≥4 days	12,270(86.7)	1,875(13.3)	
	Days of intensive physical exercise	No	10,961(89.7)	1,265(10.3)	<0.001
		≤3 days	24,335(88.6)	3,140(11.4)	
		≥4 days	12,941(86.6)	2,006(13.4)	
	Days of muscle strength exercise	No	24,830(89.7)	2,844(10.3)	<0.001
		≤3 days	15,720(87.3)	2,282(12.7)	
		≥4 days	7,687(85.7)	1,285(14.3)	
Injury & safety	Seat belt in a passenger car	No	10,566(86.9)	1,596(13.1)	<0.001
		Yes	37,671(88.7)	4,815(11.3)	
	Motorcycle helmet	No ride	43,823(88.8)	5,500(11.2)	<0.001
		Put on	2,547(83.7)	497(16.3)	
		Take off	1,867(81.9)	414(18.1)	
	Bicycle helmet	No ride	29,879(89.2)	3,631(10.8)	<0.001
		Put on	4,114(88.1)	558(11.9)	
		Take off	14,244(86.5)	2,222(13.5)	
	Injuries	No	26,498(89.7)	3,058(10.3)	<0.001
		Yes	21,739(86.6)	3,353(13.4)	
	Treatment injuries at a hospital	No	37,093(89.3)	4,451(10.7)	<0.001
		Yes	11,144(85.0)	1,960(15.0)	
	Wearing earphones or cell phones	No	47,387(88.4)	6,201(11.6)	<0.001
		Yes	850(80.2)	210(19.8)	
	Safety education	No	4,617(86.8)	703(13.2)	<0.001
		Yes	43,620(88.4)	5,708(11.6)	

*by complex samples chi-square test

3. Risk factors affecting tooth fracture

<Table 3> delineates the risk factors associated with tooth fracture. Significant differences were found in risk behaviors related to violence treatment (p<0.001) and severe intoxication (p<0.001). Students without a history of violence treatment exhibited a 1.70 times higher incidence of tooth fracture (95% CI: 1.48–1.95), whereas those reporting heavy intoxication episodes demonstrated a 2.09 times higher (95% CI: 1.73–2.53). Physical activity variables also revealed significant associations. Engagement in physical activity for 60 minutes or more per week (p<0.001), participation in high-intensity activities (p<0.01), and involvement in strength

training (p<0.001) were all linked to elevated tooth fracture incidence. Specifically, students active for four or more days per week had a 1.36 times higher incidence (95% CI: 1.27–1.46); those engaging in high-intensity activity at least four days weekly showed a 1.34 times higher (95% CI: 1.25–1.45); and individuals performing strength training four or more days per week exhibited a 1.46 times higher (95% CI: 1.36–1.57) compared to their less active counterparts. Furthermore, factors related to injury and safety awareness demonstrated significant differences. These included seatbelt use in passenger vehicles (p<0.001), motorcycle helmet use (p<0.001), bicycle helmet use (p<0.05), history of injury at school (p<0.001), hospitalization due to school-related injuries (p<0.001), hospitalization resulting from earphone or cellphone-related injuries (p<0.001), and receipt of safety education (p<0.001). Students who did not use seatbelts had a 1.18 times higher of tooth fracture (95% CI: 1.11–1.26); those who did not wear motorcycle helmets exhibited a 1.77 times higher (95% CI: 1.58–1.97); and students who refrained from using bicycle helmets had a 1.28 times higher (95% CI: 1.21–1.36) relative to non-riders. Additionally, students with a history of injury had a 1.34 times higher (95% CI: 1.27–1.41); those hospitalized for school injuries showed a 1.47 times higher (95% CI: 1.38–1.55); individuals hospitalized due to earphone or cellphone-related injuries demonstrated a 1.89 times higher (95% CI: 1.62–2.20); and students lacking safety education experienced a 1.16 times higher in tooth fracture incidence (95% CI: 1.07–1.27).

Table 3. Risk factors affecting tooth fracture

Variables	Division		Tooth fracture	
			OR(95% CI)	p^*
General characteristics	Gender	Male	1.09(1.03-1.15)	0.002
		Female	1	
	School grade	Middle school	1	
		High school	1.08(1.03-1.14)	0.004
	Academic achievement	High	1	
		Middle	1.05(0.99-1.13)	0.129
		Low	1.35(1.27-1.44)	<0.001
	Economic status	High	1	
		Middle	1.01(0.96-1.07)	0.680
		Low	1.43(1.32-1.55)	<0.001
	Health level	Healthy	1	
		Normal	1.07(1.01-1.14)	0.031
		Unhealthy	1.35(1.24-1.47)	<0.001
	Sleep recovery	Enough	1	
		Insufficient	1.15(1.09-1.21)	<0.001
Risk behaviors	Violence therapy	No	1	
		Yes	1.70(1.48-1.950)	<0.001
	Binge drinking	No	1	
		Yes	2.09(1.73-2.53)	<0.001
Physical activity (weeks)	≥60-min physical exercise	No	1	
		≤3 days	1.21(1.14-1.29)	<0.001
		≥4 days	1.36(1.27-1.46)	<0.001
	Days of intensive physical exercise	No	1	
		≤3 days	1.12(1.04-1.20)	0.002
		≥4 days	1.34(1.25-1.45)	<0.001
	Days of muscle strength exercise	No	1	
		≤3 days	1.27(1.20-1.34)	<0.001
		≥4 days	1.46(1.36-1.57)	<0.001

Table 3. To be continued

Variables	Division		Tooth fracture	
			OR(95% CI)	p^*
Injury & safety	Seat belt in a passenger car	No	1.18(1.11-1.26)	<0.001
		Yes	1	
	Motorcycle helmet	No ride	1	
		Put on	1.56(1.41-1.72)	<0.001
		Take off	1.77(1.58-1.97)	<0.001
	Bicycle helmet	No ride	1	
		Put on	1.12(1.02-1.23)	0.023
		Take off	1.28(1.21-1.36)	<0.001
	Injuries	No	1	
		Yes	1.34(1.27-1.41)	<0.001
	Treatment injuries at a hospital	No	1	
		Yes	1.47(1.38-1.55)	<0.001
	Wearing earphones or cell phones	No	1	
		Yes	1.89(1.62-2.20)	<0.001
	Safety education	No	1.16(1.07-1.27)	<0.001
		Yes	1	

OR: odds ratio; CI: confidence interval
*by complex samples logistic regression

Discussion

This study used data from the 20th Youth Health Behavior Survey (2024) to examine the relationships among risk behaviors, physical activity, injury experiences, safety awareness, and tooth fracture in Korean adolescents. The analysis produced the following conclusions.

First, Risk behaviors such as violence-related medical treatment (OR=1.70) and heavy intoxication episodes (OR=2.09) are significantly linked to tooth fracture. Jung [13] reported a 1.67-fold increase in tooth fracture among individuals treated for violence-related injuries. Jeong and Jang [14] found that 58.2% of adolescent drinkers had a high prevalence of oral symptoms, indicating a strong correlation between risk behaviors and oral injuries. Min and Kim [15] observed a 13.0% prevalence of tooth fracture among drinkers, with heavy intoxication increasing risk by 1.33 to 2.09 times [16], consistent with our findings. Together, these studies confirm that alcohol consumption and heavy intoxication significantly raise tooth fracture risk. Preventive strategies should therefore address not only physical safety but also lifestyle modification and delinquency prevention.

Second, This study found that the risk of tooth fracture was 1.36 times higher (OR=1.36) among individuals engaging in physical activity sessions lasting 60 minutes or more, at least four times per week. Similar elevated risks were noted for participants involved in high-intensity physical activity (OR=1.34) and strength training (OR=1.46) with the same frequency. While physical activity benefits adolescents' cardiopulmonary function and muscle development, it also increases trauma risk due to greater physical contact, falls, and sports equipment use. Supporting this, Petti and Glendor [5] reported higher tooth fracture risk among more active adolescents. Min and Kim [15] found that 12.3% of adolescents active four or more days weekly experienced tooth fractures. Kim et al. [10] showed the highest tooth fracture prevalence (15.1%) among students with at least 60 minutes of daily activity, with similarly high rates for high-intensity and strength training five or more days per week (13.6%). These findings align with prior research linking increased activity frequency and intensity to greater tooth fracture risk. Thus, alongside promoting physical activity, protective measures-such as mouthguards, safety protocols, and trauma prevention education-are essential to preserve health benefits while reducing dental injuries. Shortened: This study found that tooth fracture risk increased by 1.34 to 1.46 times among adolescents

engaging in frequent (≥4 times/week), prolonged (≥60 minutes), or intense physical activity, including strength training. While physical activity improves health, it raises trauma risk due to contact, falls, and equipment use. Prior studies confirm this association, with tooth fracture rates up to 15.1% among highly active youths. Therefore, promoting physical activity should be paired with protective measures like mouthguards, safety protocols, and education to reduce dental injuries.

Third, seatbelt use (OR=1.18), lack of helmet use among motorcyclists or bicyclists (OR=1.77), school-related injury experiences (OR=1.34), hospital treatment following injury (OR=1.47), and absence of school safety education (OR=1.16) were significantly linked to adolescent tooth fractures. These results highlight the importance of adherence to traffic and sports safety regulations to prevent oral injuries. This aligns with prior studies: Bae [4] showed that greater safety awareness increases protective equipment use and reduces injury risk; Gassner et al. [8] found lower injury rates among those completing safety education; and Jung [13] reported higher injury risks in adolescents with hospital-treated school injuries and no safety education, consistent with our findings. This study shows that using earphones or headphones nearly doubles the risk of injury (OR=1.89). It highlights lifestyle factors previously underexplored and reveals new risks linked to changes in adolescents' daily behaviors. These findings emphasize the need to improve safety education and promote consistent use of protective gear to prevent tooth fractures. Specifically, seatbelts and helmets reduce impact force and injury risk, while safety education raises awareness and encourages protective actions.

This study highlights the need for a comprehensive strategy to prevent tooth fractures in adolescents. First, systematic education on using protective gear during school physical activities is crucial to promote consistent use. Second, integrating safety education into the formal curriculum ensures all students acquire essential trauma prevention knowledge. Third, enforcing youth health policies to reduce high-risk behaviors like violence and alcohol use is vital. This multifaceted approach not only prevents sports-related tooth fractures but also supports overall adolescent health and lifestyle management.

This study has some limitations. First, its cross-sectional design prevents establishing cause-and-effect relationships. Second, it does not provide detailed information on specific types of tooth injuries (such as fractures, dislocations, or root damage) or the circumstances in which these injuries occurred (like during sports or everyday activities). Third, it lacks comprehensive data on the use of oral protective devices, such as mouthguards, which limits the ability to compare findings with international studies. On the other hand, a key strength of this research is its use of a large, nationally representative sample, allowing for an extensive analysis of physical activity, injury experiences, safety awareness, and risk behaviors. This comprehensive approach provides a more robust evidence base for prevention policies compared to previous studies that examined isolated factors. Future studies should adopt longitudinal designs and incorporate detailed variables, including the use of oral protective equipment, to improve understanding of causality and enhance global applicability.

Conclusions

This study utilized data from the 20th Youth Health Behavior Survey (2024) to investigate various risk factors associated with traumatic dental injuries among Korean adolescents, with a specific focus on physical activity, injury and safety awareness, and risk-related behaviors. The findings are outlined below.

1. The prevalence of tooth fracture was higher among male students, high school students, those with lower academic achievement, lower economic status, unhealthy, and insufficient recovery from sleep.

2. The risk of tooth fracture increased with greater participation in physical activities, including ≥60 minutes of physical activity per week, vigorous-intensity physical activity, and more frequent muscle-strengthening exercises. Additionally, risky behaviors such as not wearing seat belts or helmets, having previous injury or hospital treatment experience, lack of safety education, and experiences of violence, binge drinking, or drug use significantly increased the likelihood of tooth fracture.

Tooth fracture in adolescence are influenced by multidimensional factors rather than a single cause. These findings suggest that prevention strategies should comprehensively address physical activity management, enhancement of safety awareness, and reduction of risky behaviors.

Notes

Author Contributions

The author fully participated in the work performed and documented truthfully.

Conflicts of Interest

The author declared no conflicts of interest.

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Ethical Statement

None.

Data Availability

Data can be obtained from the first author.

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한국 청소년의 건강행태와 치아 외상 경험의 관련성 : 제20차 청소년건강행태조사 자료 활용

초록

연구목적: 본 연구는 제20차(2024년) 청소년건강행태조사 자료를 활용하여 우리나라 청소년의 치아 손상 경험에 영향을 미치는 다양한 위험 요인들을 신체활동, 손상 및 안전의식, 위험 행동 측면에서 살펴보고자 하였다. **연구방법:** IBM SPSS 25.0 program을 사용하여 청소년행태조사의 복합표본설계를 고려하여 가중치, 층화변수, 집락변수를 적용한 복합표본 분석을 실시하였다. **연구결과:** 주당 60분 이상 신체활동, 고강도 신체활동, 근력 운동 빈도가 증가할수록 치아 외상 위험이 높아졌으며, 안전벨트·헬멧 미착용, 손상 경험, 병원 치료 경험, 안전교육 미이수, 폭력 경험, 만취 경험 같은 위험 행동이 치아 외상 위험을 유의하게 증가시키는 것으로 나타났다. **결론:** 이러한 결과는 청소년기 치아 외상이 단일 원인보다는 다차원적 요인에 의해 발생하며, 예방을 위해서는 신체활동 관리, 안전의식 향상, 위험 행동 예방이 종합적으로 이루어져야 한다.

색인: 청소년, 손상, 신체활동, 건강 위험, 안전의식, 치아파절