

A Study on the Food Hygiene Attitude and Personal Hygiene Management of Students by high school type in Chungcheongnam-do

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충남지역 고등학교 유형별 학생들의 식품위생 태도와 개인 위생관리에 관한 연구

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Abstract This study aimed to provide basic data for the development of education programs on food hygiene attitude and personal hygiene management of high school students by type of school. From July 16 to October 15, 2015, questionnaires were distributed to 30 students per grade at 16 high schools in Chungcheongnam-do, and a total of 1214 questionnaires (excluding unrecurrent and insufficient questionnaires) were processed using SPSS (ver 18.0). As a result, academic high school students answered more checking food's shelf life when they bought it in the store(3.79, 3.60), not eating the cooked and heated food after keeping without heating(2.85, 2.98), and storing food in the refrigerator in accordance with its characteristics(3.90, 3.76) than specialized high school students. Academic high school students were found to be more careful than specialized high school students, to wash hands before meals(3.66, 3.52), after went to toilet(4.30, 3.95), in the right way(3.63 and 3.45), and to go around less during meal time(2.19, 2.43) and to go to the toilet less often during meal time(2.28, 2.47). In this study, academic and specialized high school students showed significant differences in food hygiene attitude and personal hygiene management, and academic high school students had significantly better food hygiene attitude and personal hygiene control than specialized high school students. but still need to be improved. Therefore, it is suggested that education on food hygiene attitude and personal hygiene management should be strengthened according to the type of school.

요약 본 연구의 목적은 학교 유형별 고등학교 학생들의 식품위생 태도와 개인위생 관리에 관한 교육 프로그램의 개발을 위한 기초 자료를 제공하는 것이다. 2015년 7월 16일부터 10월 15일 까지 충남지역 16개 고등학교의 학년 당 30명씩에게 설문지를 배포하였고, 미회수 및 불충분한 설문지를 제외한, 총 1214 부(인문고등학생 473명과 특성화고 741)에 대해 SPSS (ver 18.0)을 사용하여 통계처리하였다. 연구 결과, 인문계 고등학생은 특성화 고등학생보다 식품을 살 때 유통기한을 더 확인 하고(3.79, 3.60), 조리·가열된 식품을 보관 후 그대로 먹는다는 응답이 낮았고(2.85, 2.98), 식품의 특성에 맞게 냉장 냉동 보관 저장한다(3.90, 3.76)고 하였다. 인문계 고등학생이 특성화 고등학생보다 식사 전 손씻기(3.66, 3.52), 화장실 다녀온 후 손씻기 (4.30, 3.95), 올바른 방법으로 손씻기(3.63, 3.45)를 잘하였고, 식사시간 중에 돌아다니기(2.19, 2.43)와 식사시간 중간에 화장 실을 적게 가는 것(2.28, 2.47)으로 조사되었다. 본 연구에서, 일반 고등학생과 특성화고등학생들은 식품위생태도와 개인위생 관리 부분에서 유의적 차이를 보였고, 일반 고등학생이 특성화 고등학생보다 식품위생태도와 개인위생관리를 잘하는 것으로 조사되었다. 그러나 그 정도는 높지 않아, 개선이 필요한 것으로 사료된다. 따라서 학교유형에 따라 식품위생태도와 개인위생 관리에 대한 교육을 강화해야 함을 제언한다.

Keywords : Food Hygiene, Hygiene Management, Academic high school, Specialized high school, School type

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Received January 8, 2019

Revised (1st January 25, 2019, 2nd January 30, 2019)

Accepted February 1, 2019

Published February 28, 2019

1. Introduction

At a time when food hygiene issues were expected to be expanded due to the expansion of international exchanges, school hygiene education for high school students who have more opportunities to choose their own meals and take care of their health is very important. The specialized high school students are more likely to work in the industrial field after graduation, so that they need to secure their own hygiene. However, food hygiene safety and personal hygiene education for high school students are still lacking in reality[1-2]. Some high school students showed a tendency to underestimate the importance of livelihood safety, have a low level of safety consciousness[3], and safety education[4].

Previous studies on food hygiene included that the study on food hygiene and food safety for university students[5-9] and the study on food safety for the general public[10-13], and restaurant staff[14] and the study on food safety awareness for middle school students[15], but the study on students' safety awareness[16] for high school students were few except for the survey on food safety and HACCP[17].

The academic high school students who are educated for university entrance-oriented and the specialized high school students who can work after graduation through lab-oriented education showed differences in food hygiene awareness, and the necessity of specialized hygiene education by school type was suggested[18]. However, there have been few studies on the differences between academic and specialized high school students on food hygiene attitude and personal hygiene management. The purpose of this study was to provide basic data for the development of educational programs to improve students' food hygiene attitude and personal hygiene management status.

2. Materials and Method

2.1 Subject

This study was conducted on 16 high school students located in Chungnam area. The data were collected by questionnaire survey method. The questionnaires were distributed to 30 students per grade, and 473 students in academic and 741 students in specialized high school, 1,214 students's questionnaires in total, were used as research data, excluding unreturned and insufficient questionnaires. The questionnaire was distributed and collected from July 16 to October 15, 2015.

2.2 Method

The questionnaire on food hygiene and personal hygiene management was organized by referring to the questionnaire in the preceding studies[5-6], and composed of the Likert 5-point scale.

2.3 Analysis method

Questionnaires were processed using SPSS (over 18.0) for frequency analysis and t-test statistics. Cronbach's alpha was calculated for each element to test the reliability of the assessment of food hygiene attitudes and personal hygiene management.

3. Results

Cronbach's alpha for questionnaire of the food hygiene attitude and personal hygiene management were 0.723 and 0.721, respectively. 39.0%(473) of the survey respondents were academic high school students, and 61.0%(741) were specialized high school students.

As a result of the self-diagnosis of food hygiene and safety attitude by school type, there was significant difference between the respondents of the specialized high school students and the academic high school students in the under questions. Academic high school students answered more in the question of "I always check the expiration date when I buy food at the store"

Table 1. General characteristics in subjects by school type

		High school type		Total
		Academic	Specialized	
Gender	Male	137(29.0)	481(64.9)	618(50.9)
	Female	336(71.0)	260(35.1)	596(49.1)
Grade	1st grade	174(36.8)	245(33.1)	419(34.5)
	2 nd grade	122(25.8)	357(48.2)	479(39.5)
	3 rd grade	177(37.4)	139(18.8)	316(26.0)
Total		473(100.0)	741(100.0)	1,214(100.0)

(3.79, 3.60), less "I eat cooked and heated food as it is after keeping." than specialized high school students(2.85, 2.98). Academic high school students answered more in the question of "I stored the food depends on it's characteristic" than specialized high school students(3.90, 3.76)(table 2).

There were significantly different of frequency analysis of food hygiene attitude, such as "I always check the expiration date when I buy food at the store", academic students answered so so(8.2%), yes(15.7%) and very much(10.4%), compared to 18.7%, 18.9%, 14.3% of the specialized students, respectively. As for taking a closer look at the labeling of food packaging, so so(24.2%), yes(15.2%) and very much(8.6%) of the specialized high school students, compared to 13.0%, 13.1% and 4.3% of academic high school students, respectively. In the question of storing at the refrigerator the food depend on its characteristics, academic students answered so so(8.8%), yes(21.8%), very much(7.4%), compared to 20.4%, 26.4%, 11.6% of specialized students. As a result of self-diagnosis about personal hygiene management, academic students answered more washing hands before meals(3.66, 3.52), after going to the toilet(4.30, 3.95), to the correct way(3.63, 3.45) than specialized students. Academic students seemed to less go to the toilet during mealtime(2.28, 2.47) and walk around during mealtime(2.19, 2.43) than specialized high school students(Table 3).

As for the frequency of personal hygiene management attitude, there was significantly different frequency in the question of "I always wash my hands

before eat", academic high school students answered so so(13.5%), yes(16.4%) and very likely(6.3%), specialized high school students answered so so(24.6%), yes(24.6%) and very likely(9.5%). There was significantly different in the question of "I always wash my hands after I go to toilet", academic high school students answered so so(13.5%), yes(16.4%), very likely(6.3%), specialized high school students answered so so(24.6%), yes(20.3%), very likely(9.5%). There was significantly different in the question of "I tend to walk around during mealtime.", academic high school students answered so so(7.2%), yes(4.1%) and very much(1.4%), specialized high school students answered so so(17.1%), yes(7.4%) and very much(3.3%). There was significantly different in the question of "I wash my hands according to the correct way", academic high school students answered so so(15.2%), yes(14.9%) and very much(6.3%), compared with specialized high school students answered so so(26.9%), yes(17.3%) and very much(9.6%).

There was significantly different in the question of "I tend to walk around during mealtime.", academic high school students answered so so(7.2%), yes(4.1%) and very much(1.4%), specialized high school students answered so so(17.1%), yes(7.4%) and very much(3.3%). There was significantly different in the question of "I tend to go to the toilet during mealtime.", academic high school students answered so so(7.6%), yes(4.6%) and very much(1.9%), specialized high school students answered so so(18.4%), yes(7.6%) and very much(3.7%). There was significantly different

Table 2. The frequency and mean of high school students' food hygiene attitude by school type

Survey questionnaire	Responses	Frequency(%)			P
		Academic	Specialized	Total	
I always check the expiration date when I buy the food at the store.	Not at all	9(0.7)	24(2.0)	33(2.7)	0.000
	Not like that	49(4.0)	87(7.2)	136(11.2)	
	So so	99(8.2)	227(18.7)	326(26.9)	
	Yes	190(15.7)	229(18.9)	419(34.5)	
	Very much	126(10.4)	174(14.3)	300(24.7)	
	Means±SE	3.79±0.05	3.60±0.03	3.67±0.03	0.001
I take a closer look at the labeling of food packaging.	Not at all	23(1.9)	32(2.6)	55(4.5)	0.012
	Not like that	81(6.7)	126(10.4)	207(17.1)	
	So so	158(13.0)	294(24.2)	452(37.2)	
	Yes	159(13.1)	185(15.2)	344(28.3)	
	Very much	52(4.3)	104(8.6)	156(12.9)	
	Means±SE	3.29±0.05	3.27±0.04	3.28±0.03	0.824
I tend to eat cooked and heated foods after I kept as they are.	Not at all	42(3.5)	67(5.5)	109(9.0)	0.038
	Not like that	133(11.0)	156(12.9)	289(23.8)	
	So so	174(14.3)	296(24.4)	470(38.7)	
	Yes	104(8.6)	172(14.2)	276(22.7)	
	Very much	20(1.6)	50(4.1%)	70(5.8)	
	Means±SE	2.85±0.05	2.98±0.04	2.93±0.03	0.031
I tend to store at the refrigerator the food depend on its characteristic.	Not at all	6(0.5)	7(0.6)	13(1.1)	0.000
	Not like that	5(0.4)	24(2.0)	29(2.4)	
	So so	107(8.8)	248(20.4)	355(29.3)	
	Yes	265(21.8)	320(26.4)	585(48.2)	
	Very much	90(7.4)	141(11.6)	231(19.0)	
	Means±SE	3.90±0.04	3.76±0.03	3.82±0.02	0.002
I chat while I eat or put the food on the dish.	Not at all	32(2.6)	51(4.2)	83(6.8)	0.003
	Not like that	110(9.1)	127(10.5)	237(19.5)	
	So so	146(12.0)	299(24.6)	445(36.7)	
	Yes	150(12.4)	198(16.3)	348(28.7)	
	Very much	35(2.9)	66(5.4)	101(8.3)	
	Means±SE	3.10±0.05	3.14±0.04	3.12±0.03	0.522
I tend to eat foods regardless of safety issues such as residual pesticides, food additives, genetic modification concerns, etc	Not at all	26(2.1)	43(3.5)	69(5.7)	0.014
	Not like that	92(7.6)	111(9.1)	203(16.7)	
	So so	190(15.7)	327(26.9)	517(42.6)	
	Yes	147(12.1)	204(16.8)	351(28.9)	
	Very much	18(1.5)	56(4.6)	74(6.1)	
	Means±SE	3.08±0.04	3.16±0.04	3.13±0.03	0.164
I tend to eat food made on the streets or filthy places.	Not at all	35(2.9)	49(4.0)	84(6.9)	0.211
	Not like that	90(7.4)	135(11.1)	225(18.5)	
	So so	187(15.4)	305(25.1)	492(40.6)	
	Yes	140(11.5)	198(16.3)	338(27.9)	
	Very much	20(1.6)	54(4.5)	74(6.1)	
	Means±SE	3.04±0.05	3.10±0.04	3.08±0.03	0.336
I put food with appropriate utensil.	Not at all	6(0.5)	12(1.0)	18(1.5)	0.230
	Not like that	52(4.3)	76(6.3)	128(10.6)	
	So so	187(15.4)	316(26.1)	503(41.5)	
	Yes	185(15.3)	250(20.6)	435(35.9)	
	Very much	42(3.5)	87(7.2)	129(10.6)	
	Means±SE	3.43±0.04	3.44±0.03	3.44±0.03	0.955
I always use a private dish when I eat.	Not at all	19(1.6)	17(1.4)	36(3.0)	0.009
	Not like that	62(5.1)	85(7.0)	147(12.1)	
	So so	179(14.8)	320(26.4)	499(41.1)	
	Yes	168(13.8)	216(17.8)	384(31.7)	
	Very much	45(3.7)	102(8.4)	147(12.1)	
	Means±SE	3.33±0.04	3.41±0.04	3.38±0.03	0.193

Table 3. The frequency and mean of high school students' food hygiene management by school type

Survey questionnaire	Responses	Frequency(%)			p
		Academic	Specialized	Total	
I always wash my hands before meals.	Not at all	5(0.4)	13(1.1)	18(1.5)	0.014
	Not like that	29(2.4)	67(5.5)	96(7.9)	
	So so	164(13.5)	299(24.6)	463(38.1)	
	Yes	199(16.4)	247(20.3)	446(36.7)	
	Very much	76(6.3)	115(9.5)	191(15.7)	
	Means±SE	3.66±0.04	3.52±0.03	3.57±0.03	0.007
I always wash my hands after I go to the toilet.	Not at all	1(0.1)	6(0.5)	7(0.6)	0.000
	Not like that	7(0.6)	19(1.6)	26(2.1)	
	So so	55(4.5)	203(16.7)	258(21.3)	
	Yes	194(16.0)	288(23.7)	482(39.7)	
	Very much	216(17.8)	225(18.5)	441(36.3)	
	Means±SE	4.30±0.03	3.95±0.03	4.09±0.02	0.000
I wash my hands according to the correct way.	Not at all	6(0.5)	18(1.5)	24(2.0)	0.001
	Not like that	24(2.0)	70(5.8)	94(7.7)	
	So so	185(15.2)	327(26.9)	512(42.2)	
	Yes	181(14.9)	210(17.3)	391(32.2)	
	Very much	77(6.3)	116(9.6)	193(15.9)	
	Means±SE	3.63±0.04	3.45±0.04	3.52±0.03	0.001
I tend to walk around during mealtime.	Not at all	147(12.1)	192(15.8)	339(27.9)	0.000
	Not like that	171(14.1)	211(17.4)	382(31.5)	
	So so	88(7.2)	208(17.1)	296(24.4)	
	Yes	50(4.1)	90(7.4)	140(11.5)	
	Very much	17(1.4)	40(3.3)	57(4.7)	
	Means±SE	2.19±0.05	2.43±0.04	2.34±0.03	0.000
I tend to go to the toilet during mealtime.	Not at all	142(11.7)	191(15.7)	333(27.4)	0.000
	Not like that	160(13.2)	190(15.7)	350(28.8)	
	So so	92(7.6)	223(18.4)	315(25.9)	
	Yes	56(4.6)	92(7.6)	148(12.2)	
	Very much	23(1.9)	45(3.7)	68(5.6)	
	Means±SE	2.28±0.05	2.47±0.04	2.40±0.03	0.004
I use my own cup when I use the water purifier.	Not at all	24(2.0)	44(3.6)	68(5.6)	0.000
	Not like that	76(6.3)	85(7.0)	161(13.3)	
	So so	132(10.9)	289(23.8)	421(34.7)	
	Yes	165(13.6)	199(16.4)	364(30.0)	
	Very much	76(6.3)	124(10.2)	200(16.5)	
	Means±SE	3.41±0.05	3.37±0.04	3.38±0.03	0.548
I tend to cover with a tissue, handkerchief or sleeve when I cough.	Not at all	10(0.8)	21(1.7)	31(2.6)	0.202
	Not like that	55(4.5)	87(7.2)	142(11.7)	
	So so	163(13.4)	299(24.6)	462(38.1)	
	Yes	167(13.8)	227(18.7)	394(32.5)	
	Very much	78(6.4)	107(8.8)	185(15.2)	
	Means±SE	3.52±0.05	3.42±0.04	3.46±0.03	0.071
I tend to touch my eyes, nose, mouth with unwashed hands.	Not at all	24(2.0)	49(4.0)	73(6.0)	0.012
	Not like that	84(6.9)	97(8.0)	181(14.9)	
	So so	203(16.7)	367(30.3)	570(47.0)	
	Yes	131(10.8)	166(13.7)	297(24.5)	
	Very much	30(2.5)	62(5.1)	92(7.6)	
	Means±SE	3.13±0.04	3.13±0.04	3.13±0.03	0.955
I keep my nails clean.	Not at all	5(0.4)	15(1.2)	20(1.6)	0.004
	Not like that	44(3.6)	54(4.4)	98(8.1)	
	So so	166(13.7)	327(26.9)	493(40.6)	
	Yes	183(15.1)	222(18.3)	405(33.4)	
	Very much	75(6.2)	123(10.1)	198(16.3)	
	Means±SE	3.59±0.04	3.52±0.03	3.55±0.03	0.183
How long do you wash my hands?(sec)	≤5	57(4.7)	67(5.5)	124(10.2)	0.002
	6∞10	154(12.7)	297(24.5)	451(37.1)	
	11∞15	137(11.3)	237(19.5)	374(30.8)	
	16∞20	70(5.8)	89(7.3)	159(13.1)	
	21≥	55(4.5)	51(4.2)	106(8.7)	

in the question of "I use my own cup when using the water purifier.", academic high school students answered so so(10.9%), yes(13.6%) and very much(6.3%), specialized high school students answered so so(23.8%), yes(16.4%) and very much(10.2%). There was significantly different in the question of "I tend to cover with a tissue, handkerchief or sleeve when I cough.", academic high school students answered so so(16.7%), yes(10.8%) and very much(2.5%), specialized high school students answered so so(24.6%), yes(18.7%) and very much(8.8%). There was significantly different in the question of "I keep my nails clean", academic high school students answered so so(13.7%), yes(15.1%) and very much(6.2%), specialized high school students answered so so(26.9%), yes(18.3%) and very much(10.1%).

There was no significantly different in the question of "I tend to cover with a tissue handkerchief of sleeve when I cough", academic high school students answered yes(13.8%) and very much(6.4%), specialized high school students answered yes(18.7%) and very much(8.8%).

Even though middle east respiratory syndrome(MERS) situation was still during survey, only 20.2% of academic high school students and 27.5% of specialized high school students seemed to have good behavior of cough etiquette.

In the previous study on food hygiene safety awareness, there was a difference between the academic and specialized high school students[18]. Food hygiene attitude and personal hygiene management differed by school type in this study also.

4. Conclusion

In the food hygiene attitude part, the students of the academic high school were significantly more checking of the food's shelf life when they bought it in the store, they did not eat the cooked and heated food after keeping, and store food in the refrigerator in

accordance with its characteristics. In the personal hygiene management, academic high school students more washed their hand before meals, after went to toilet, according to correct way, not tended to walk around during meal time and went to toilet during meal time than specialized high school students, and those were statistically effective. Specialized high school students need to be educated more with personal hygiene management than academic high school students. Although this survey were conducted at the time of MERS situation, 30.8% of respondents answered yes and 20.4% of them did very much whether cover with a tissue, handkerchief, or sleeve when they cough. The rate of positive respondents were low, so more coughing etiquette should be educated to high school students. In the questionnaire of "How much time do you wash your hands?", specialized high school students answered 11-15 sec.(19.5%), 16-20 sec.(7.3%), longer than 21 sec.(4.2%), on the other hand , academic high school students answered 11-15 sec.(11.3%), 16-20 sec.(5.8%), longer than 21 sec.(4.5%). There were significantly different frequency by school type, but high school students did not have sufficient time for hand washing compared with 30 seconds, recommended time for washing hands by Ministry of Food and Drug Safety(MFDS).

Therefore, it is necessary to strengthen food hygiene attitude and personal hygiene management in high schools and to differentiate major education contents by type of school.

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<Research Interests>

Nutrition, Food Hygiene, Education