Original Research Article

Investigation of factors effecting antibiotics use of health services vocational school students

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ABSTRACT

Background: The scope of this study is to evaluate information, behavior and attitude of antibiotics use of students in Golhisar Health Services Vocational School, Burdur Mehmet Akif Ersoy University.
Methods: A questionnaire of 19 questions is applied to 701 students. In order to determine students' attitude at antibiotics use; to evaluate attitude, subjective norm and intention, Likert scale consisting of multiple-choice questions were used.
Results: Unattached sample test t showed that there is a significant difference in male and female students in subjective norm effecting antibiotic use and mean points of male students are higher than those of female students. It is found that antibiotic use due to attitude in 20 years and younger students than is significantly higher than 21 years old or older students. No significant difference determined among attitude, subjective norm and intention which effect use of antibiotics in terms of alcohol use, chronic disease and health insurance possession. As the programs that students are attending are evaluated, difference is observed only in attitude factor in this study. It is determined that attitude to antibiotic use of students of first and emergency aid program is lower than pharmacy services and child development programs.
Conclusions: This study has shown that students are conscious about antibiotics use and their level of antibiotics use is low. Based on the results of the study, having individuals in the society educated about antibiotics use will substantially contribute to conscious use of antibiotics.

Keywords: Use of antibiotics, Attitude, Subjective norm, Intention

INTRODUCTION

Antibiotics, also known as antibacterials, are medications that destroy or slow down the growth of bacteria.[1] Antibiotics are the most commonly used drug groups in the world. The use of antibiotics is widespread in Turkey. Therefore, since antibiotics are widely used for the protection of human health, their therapeutic properties and side effects should be well known.[2] Today, antibiotics differ according to their mechanism of action and microorganisms. In particular, antibiotics shows the effects in microorganisms by inhibiting enzyme systems, disrupting cell wall structures and stopping protein synthesis.[3]

Unlike other drugs, antibiotics are special drugs that can disrupt human and environmental flora. The potential adverse effects of antibiotic use for this purpose, both over the individual patient and on public health may outweigh the potential benefits. Excessive and inappropriate antibiotic use causes serious allergic reactions, renal failure, impaired liver function and intestinal flora.[4]

At the same time, excessive and inappropriate use of antibiotics cause the emergence and spread of antibiotic resistant. Antibiotic resistance occur when a drug loses its ability to inhibit bacterial growth effectively.[5] Antibiotic resistance is caused by non-compliance with the treatment of the physician, the use of antibiotics in insufficient doses and time, and the intake of antibiotics in food stuffs more than necessary.[6] At the same time, starting to use antibiotics without seeing a doctor, without prescription, by suggestion from pharmacy, parents or friends are evaluated as resistance building factors.[7] There have been many researches suggesting that antibiotics are not being used correctly, such as advice of the pharmacist, believing in the advice of parents and friends and discontinuing use when disappear of the disease symptoms.[8-11] There are also studies showing that individuals do not have sufficient information about the use of antibiotics.[12-14]

Antibiotic resistance will affect not only the patients in nowadays but also the quality of life of the society and future generations. According to WHO, antibiotics resistance is an increasingly serious threat to global public health that requires action across all government sectors and society.[15] In a recent report estimates that, by 2050, 10 million people will die every year due to antibiotics resistance unless a global response to the problem of antibiotics resistance is mounted.[16] Against this situation countries are trying to develop various solutions. One of the precaution taken directly or indirectly is "rational drug use" practices.[17] Rational use of medicines requires that "patients receive medications appropriate to their clinical needs, in doses that meet their own individual requirements, for an adequate period of time, and at the lowest cost to them and their community".[15] Therefore, it is essential that antibiotics are used in accordance with rational drug use principles. Especially, it is aimed to prevent unnecessary and excessive use of antibiotics with rational drug use, to reduce economic losses in treatment, to increase the quality of life of the society and to reduce antibiotic resistance.[18]

Theory of planned behavior (TPB) is accepted as a comprehensive theory explaining the variables effecting the behavior, where personal attitude, subjective norm and percieved behavioral control determines intention of behavior. An Individual thinking to take action for a behavior according to his own belief set and his positive or negative thoughts about that behavior constitute his personal attitude.[19] Subjective norm effecting intention is the social pressure in the case the individual whether performing that action or not. Within the subjective norm, individuals determine their behavioral intentions effected by their parents, close friends or colleagues.[19] Depending on how subjective norm and personal attitute are positive, probability of implementation of that action, thus, intention of taking that behavioral action increases. Similarly, if the individual is affected negatively by a subjective norm, probability of negativity in his intention

is high.[20] Another element of theory of planned behavior, perceived behavioral control expresses how easy or hard to perform a behavior for an individual. It represents the individual's perception of existence or lack of resources or opportunity needed while performing a behavior. The probability of a behavior to be implemented is higher if intention towards that behavior is strong.[21]

This study, providing information on whether health services vocational school students are conscious about antibiotics use, will be helpful for educational programs and applications on antibiotics use.

METHODS

This study was carried out by using face to face questionnaire method with pharmacy services program, first and emergency aid program, child development program and medical secretarial program students studying at Golhisar Health Services Vocational School, Burdur Mehmet Akif Ersoy University. Total 701 students in November 2019 were interviewed. The study was approved by the Non-Interventional Clinical Research Ethics Committee of Mehmet Akif Ersoy University, Turkey.

Antibiotic use scale developed by Atik et al was used to determine the level of antibiotic use of university students.[11] Antibiotic use scale consists of three sub-dimensions and 19 items. The sub-dimensions are "attitude", "subjective norm" and "intention". Attitude sub-dimension 11 items, subjective norm sub-dimension 5 and intention sub-dimension 3 items consist of the response scales use anchors such as 1=strongly disagree, 2=disagree, 3=neutral, 4=agree, 5=strongly agree. The scores obtained from the scale developed by Atik et al are attitude (11 to 55 scores), subjective norm (5-25 scores), intention (3 to 15 scores) and are expected to be low for all three sub-dimensions.[11] Scores were calculated separately for each sub-dimension. In the study of Atik et al, the cronbach alpha internal consistency coefficients of the sub-dimensions were determined 0.929 for the attitude sub-dimension, 0.836 for the subjective norm sub-dimension, 0.854 for the intention sub-dimension, 0.945 for the whole scale.[11] In our study, The cronbach alpha internal consistency coefficients of the used questionnaire were determined to 0.929 for the attitude subscale, 0.753 for the subjective norm sub-dimension, 0.878 for the intention sub-dimension, 0.930 for the whole scale.

The collected data were analysed by SPSS version 24. The data were presented in the form of percentages in the tables. The obtained questionnaire data were analyzed with frequency analysis of demographic questions directed to students and different relationships between demographic questions and answers given to scale questions. In order to test the hypothesis were applied frequency analysis, independent sample t test and

ANOVA test. P value below 0.05 was considered to be statistically significant.

RESULTS

Table 1 shows the socio-demographic profile of the students (n=701). Majority (79.9%) of students were under 21 years of age. Majority (76.0%) of them were females. The highest participation was observed in 220 pharmacy services students. Most students (71.8%) had health insurance and did not use alcohol (86.7%). 92.8% of the students did not have a chronic disease.

Table 1: Socio-demographic profile of study population (n=701).

Socio-demographic variable	Number (%)
Gender	
Female	533 (76.0)
Men	168 (24.0)
Age (in years)	
≤20	560 (79.9)
≥21	141 (20.1)
Class	
1st class	370 (52.8)
2nd class	331 (47.2)
Educational programs	
Pharmacy services	220 (31.4)
First and emergency aid	174 (24.8)
Medical secretarial	113 (16.1)
Child development	194 (27.7)
Health insurance	
Yes	504 (71.8)
No	197 (28.1)
Alcohol use status	
Yes	93 (13.3)
No	608 (86.7)
Chronic disease	
Yes	50 (7.2)
No	651 (92.8)

Analysis of research hypotheses

Hypotheses 1: Socio-demographic characteristics (gender, age, class, presence of health insurance, alcohol use status and presence of chronic disease) of the students participated in the research affect the use of antibiotics.

As a result of independent sample t test, there was a significant difference between the males and females in terms of the level of antibiotic use in subjective norm sub-dimension affecting antibiotic use but there was no significant difference in the other sub-dimensions. When the mean score of subjective norm was evaluated, the mean score of men is higher than women. There was a difference between the sub-dimensions that affect the use of antibiotics in the age variable of the students. While there was a significant difference in the attitudes sub-dimension affecting antibiotic use according to the age variable, there was no significant difference in the other sub-dimensions. According to this the average of students aged 20 and under is higher than those of aged 21 and older. According to class variable, there was no significant difference in all three sub-dimensions affecting antibiotic use. From the aspect of whether student has social security, no significant difference found effective on antibiotics use. From the aspect of whether participants consume alcohol, no significant difference found effective on antibiotics use. When variable of whether having a chronic disease or not checked no significant difference found effective on all three aspects of antibiotics use (Table 2).

As Table 3 is viewed according to attended program variable, when distribution of health services vocational school students' attitude, subjective norm and intention aspects Tukey comparison is analyzed significant difference is determined only in attitude level. That difference was between attitude level of students of First and Emergency Aid Program and students of Pharmacy Services Program and Child Development Program. Attitude level means of students attending Pharmacy Services Program and of students attending Child Development Programnare determined to be higher than that of students attending First and Emergency Aid Program.

Table 2: Antibiotic use behavior of students depending on socio-demographic characteristics.

Socio-demographic variable	Attitude			Subjective norms		Intentions	
	N	Mean	P value	Mean	P value	Mean	P value
Gender							
Female	533	2.10	0.804	2.00	0.009*	2.07	0.136
Men	168	2.11		2.17		2.20	
Age (in years)							
15-20	560	2.14	0.003*	2.05	0.459	2.11	0.563
21-30	141	1.92		2.00		2.05	
Class							
1st class	370	2.07	0.281	2.03	0.518	2.10	0.884
2nd class	331	2.13		2.06		2.09	

Continued.

Socio-demographic variable	Attitude			Subjective norms		Intentions	
	N	Mean	P value	Mean	P value	Mean	P value
Health insurance							
Yes	504	2.10	0.936	2.04	0.760	2.10	0.994
No	197	2.09		2.06		2.10	
Alcohol use status							
Yes	93	2.01	0.314	2.03	0.871	2.09	0.949
No	608	2.11		2.05		2.10	
Chronic disease							
Yes	50	2.01	0.417	1.86	0.063	1.98	0.375
No	651	2.10		2.06		2.11	

*significant association

Table 3: Comparison of antibiotic usage factors according to different programs.

Educationl programs	Attitude		Subjective norms		Intentions	
	Educational programs	P value	Educational programs	P value	Educational programs	P value
Pharmacy services	First and emergency aid	0.025*	First and emergency aid	0.074	First and emergency aid	0.345
	Medical secretarial	0.244	Medical secretarial	0.963	Medical secretarial	0.368
	Child development	0.926	Child development	1.000	Child development	0.457
First and emergency aid	Pharmacy services	0.025*	Pharmacy services	0.074	Pharmacy services	0.345
	Medical secretarial	0.938	Medical secretarial	0.394	Medical secretarial	0.999
	Child development	0.005*	Child development	0.074	Child development	0.996
Medical secretarial	Pharmacy services	0.244	Pharmacy services	0.963	Pharmacy services	0.368
	First and emergency aid	0.938	First and emergency aid	0.394	First and emergency aid	0.999
	Child development	0.090	Child development	0.952	Child development	0.984
Child development	Pharmacy services	0.926	Pharmacy services	1.000	Pharmacy services	0.457
	First and emergency aid	0.005*	First and emergency aid	0.074	First and emergency aid	0.996
	Medical secretarial	0.090	Medical secretarial	0.952	Medical secretarial	0.984

*significant association.

Socio-demographic characteristics (gender, class, age, presence of health insurance, alcohol use status and presence of chronic illness) of the students participated in the research partially affect the use of antibiotics.

Hypotheses 2: Antibiotic use level of the students participating in the study is low.

Antibiotic usage levels were examined in three levels as low, medium and high. Before trying the hypotheses must find the interval of scores. The highest average score taken from the scale is 5 and the lowest average score is

1. By subtracting the highest value (5) from the lowest value (1) of the data set, then the differences were divided by three and the result was 1.33. With this procedure, the score interval is found. According to this values, low level includes the scores interval 1 and 2.33, moderate level includes scores interval 2.34 and 3.67, high level includes scores interval 3.67 and 5.00.

According to Table 4, all sub-dimensions of the antibiotic use scale and the general average of the scale were determined to low.

Table 4: Hypotheses 2 score averages frequency analysis.

Antibiotic use scale sub-dimensions	N	Minimum	Maximum	Ortalama	Standard deviation
Attitude	701	1	5	2.099	0.783
Subjective norms	701	1	5	2.049	0.732
İntentions	701	1	5	2.103	1.022
General average	701	1	5	2.086	0.696

DISCUSSION

The aim of this study was to investigate the factors affecting the behaviors towards antibiotic use of the students of Golhisar Health Services Vocational School, Burdur Mehmet Akif Ersoy University.

Improper use of antibiotics leads to an increase in the rate of side effects as well as increased antibacterial resistance, treatment failure, and cost increase. Therefore, the "rational use of antibiotics", which we can define as antibiotics in the right patient with the right indications, at the correct dose interval and at the right time, seems to be the most appropriate strategy to slow down the increase of antibiotic resistance.[22] TPB has been used successfully in the evaluation of many medical applications including antibiotic use.[23]

Individual's behavior when face a health problem is shaped according to their perception of health, health knowledge level, educational level and their expectations from health organizations.[24] From the aspect the demographic characteristics of this study were evaluated, 76% of the students were female and 24% were male. In this study; ıt was found that antibiotic use related of subjective norm significantly higher in male students than in female students. According to TPB, subjective norm is the state of being effected by the social pressure faced when a behavior is fulfilled or not.[20] When the subjective norm factor affecting antibiotic use in this study is examined, it can be said that female students showed more positive behavior than male students. Alam et al. reported that self-medication prevalence of medical and pharmacy students was 100%.[25] Also, statistical findings in terms of gender show that the attitude towards antibiotic use in female students is more accurate. This situation suggests that rational antibiotic use behaviors in female students develop more than men. In a study conducted by Celik et al that female students exhibited more positive behaviors in terms of antibiotic use than male students.[26] Another study reported that men had higher rates of self-medication with the advice of relatives and friends.[27] Similar results emerged in this study. At the same time, consistent with TPB, subjective norm contributed to anticipate antibiotics use behavior and made us think male antibiotic use behavior is much more affected by factors like parents, friends and social media. Furthermore when female students are considered to raise their children in the future, this conclusion is pleasing in creating positive behavioral change process.

In the research, 79.9% of the students are 20 years or younger and 20.1% of them are 21 years or older. In this study, when the factors affecting the age-related antibiotic use levels of the students were evaluated, a significant difference was found in the attitude level, but no significant difference was found in subjective norms and intentions. According to TPB theory attitude consist of individual thinking taking an action consistent with his beliefs, meaning he is interpreting both positive and negative thoughts about that behavior.[21] Antibiotic use in regard to attitude has seen to be significantly higher in students of 20 years or younger than of students 21 years or older. In another study, antibiotics use of 21 years and older found lower, which is supporting findings of this research.[28] Similarly Barutçu et al reported that the higher educational level the less tendency to use medicine by self-decision; individuals with higher age and education have higher rational medicine use consciousness.[29]

It is determined that 71.8% of students have health insurance. No significant difference was determined in the aspects of attitude, subjective norm and intention due to having health insurance or not. In the studies, Eglence et al 94.2%, Yılmaz et al 85,8% of students reported they had health security.[8,30] Researchers have reported that people with health insurance see the doctor more and use more prescribed antibiotics. According to the findings of this study, although students with health insurance are able to obtain prescribed antibiotics when they are sick, they prefer not to because they are conscious about antibiotics use.

Most of the students 86.7% have not use alcohol. No significant difference was determined on the aspects of personal attitude, subjective norm and intention due to use of alcohol. In a study, the rate of alcohol use among college students was reported to be 48.6%.[31] Similarly, Dogan and Avcı reported that alcohol use may increase or decrease the effect of some drugs and alcohol drug interactions may cause drug poisoning. In this study, alcohol use was found to be lower than the literature findings.[32] It is pleasant that students of our health services vocational school do not have bad habits and also considered as an indicator of care given to their own health. It is determined that 92.8% of students have no chronic disease. As antibiotics use due to state of having a chronic disease is investigated no significant difference is found for all three factors.

In this study, 52.8% of the students were studying in the first year and 47.2% were studying in the second year. No significant difference were observed between the first and second grade students in all three dimensions affecting antibiotic use. When the educational programs students are studying evaluated, only in attitude aspect of factors effecting antibiotics use a difference is observed. The attitudes towards antibiotic use of first and emergency aid program students were lower than in pharmacy services and child development programs students. It can be stated that although students of pharmacy services, child development, medical documentation and secretarial programs have low attitude to antibiotics use, students of first and emergency aid programs are more conscious than students of those programs and they have attitute of using less antibiotics when they are sick compared to students of those programs. At the same time it is thought that that is caused by students succeeded to attend first and emergency aid program are mostly from health

vocational high school and they received pharmacology courses in their previous degrees.

With the performed research, in terms of 701 participating students, students are in conscious behavior on antibiotics use and antibiotics use level is low. In another study evaluating information and applications about antibiotics use among university students in Nigeria, it is stated that there is high level of irrational antibiotics use among students.[33] Yılmaz et al reported that health services vocational school students had correct information and behaviors on antibiotics use.[8] In another study, Nambatya et al the difference between students receiving health sciences courses and students do not receiving health sciences courses is evaluated and unconscious antibiotic use level reported high in students do not receiving health sciences courses.[34] In a similar study, it is reported that students of health sciences vocational school consult to their own experiences, knowledge of pharmacist and their parents and use antibiotics unconsciously.[26] Findings of this study are pleasant and desired results because within the education students receive it is seen that subjects like benefits of antibiotics, side effects, when to stop using, duration of use, importance of using prescribed antibiotics, negative effects of unnecessary antibiotics use, not suggesting antibiotics to other people and not taking antibiotics by suggestions of others are effective. The perception of conscious use of antibiotics gained by students of our school as future parents can be evaluated as pleasant. Furthermore, when it is considered that when health services vocational school students will have duty in various units of health services and direct patients in their units about drug use as they are graduated, this is a positive result to be elaborated.

CONCLUSION

This study is thought to be the very first research on antibiotics use of health services vocational school students according to theory of planned behavior in Turkey. Study contributes to understanding of role of knowledge and educational programs value on antibiotics use intention. Thus, antibiotics use is important to take place in curriculums of associate degree and bachelor's degree programs of universities with health related departments. As the important future individuals, it has extremely importance that students graduate with suffient information on antibiotics use. Whether attitudes, subjective norms and intentions intended for antibiotics use of students studying outside of health programs, show significant differences can be studied in order to raise more awareness.

Rational antibiotics use is an important problem related all segments of the society in Turkey. End users are the final decision makers and performers of antibiotics use. Therefore, education of other individuals in society as well as students about antibiotics use will significantly contribute to use of antibiotics consciously. Related ministries should organize symposiums, expert panel sor exhibitions and raise awareness on antibiotics use consciously.

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