*Original Research Article*

# The effects of education level on the rate of compliance with hygiene rules during the Covid-19 Pandemic in the TRNC


## Abstract

**Background**
It is important to comply hygiene rules to reduce the spread of the disease and mortality rates in the Covid-19 Pandemic. The education level and socioeconomic characteristics of the people in the society may affect the rate of compliance with the hygiene rules in the Covid-19 pandemic.
**Aim**
The aim of this study is to investigate the effects of sociodemographic characteristics and education level of people living in TRNC on the rate of compliance with hygiene rules during the Covid-19 Pandemic.
**Materials and methods**
In our study, an online survey was conducted on 308 people voluntarily selected from TRNC citizens, the results were compared and evaluated with the SPSS program.
**Results**
According to the results we obtained in our study, a statistically significant relationship was found between some sociodemographic characteristics and the rates of compliance with the hygiene rules on the Pandemic in the TRNC, and no statistically significant relationship was found between the education level and the rates of compliance with the hygiene rules.
**Conclusion**
We think that in order to increase the rate of complying of the citizens living in the TRNC with the hygiene rules in the Pandemic, it will be effective to include men and citizens living in detached houses without social security in special education programs.


**Keywords:** Covid-19 pandemic, hygiene rules,education levels.




## Introduction

Covid-19 pandemic (P) has been one of the most common causes of death in the world for the last 2 years. For this reason, scientists in the world are working hard to reduce the spread of the disease and death rates.
It has been revealed that complying some hygiene rules, such as wearing a mask and social distancing from the first days of P, can reduce the rate of spread of P and death rates.

In P, there may be some factors that affect the complying of these hygiene rules. In our study, the effects of some sociodemographic characteristics such as education level and age, gender and occupation on the rate of compliance with hygiene rules were investigated in TRNC.In the fight against the P, the level of compliance with the hygiene rules of individuals and the factors affecting the level have gained importance. In this process, many promotional posters showing the hygiene rules and practices within the scope of combating the P were published on the website of the Ministry of Health[1].

Despite the level of development of science and technology, the unavoidable situation of the virus in the current situation has led the measures taken to be aimed at the behavior of the people. The extent to which the society has implemented the protective measures published by the state in order to prevent the further spread of the 2019 preventing the spread of the virus. Although every country takes similar measures against the virus, the diversity of health systems, the number of personnel, their technological infrastructure, even their socio-cultural characteristics and demographic structures cause differences in responding to the measures[2].

The most successful countries in the fight against the P we are in are listed as follows in a study; Japan, Israel, New Zealand. When we observe these countries, we see that they are economically and socially developed countries. In P, there may be some factors that affect the applying of these hygiene rules. When we look at the common point of these countries, we can say that they have lower social development and lower economic development than other countries[3]. It has been observed that the death rate decreases as the income of the country increases. Low- and low-middle-income countries provide a suitable environment for the spread of the P, which is caused by many factors such as poor socioeconomic conditions, poor hygiene, low level of education. In low-income countries, the Philippines, Morocco, Egypt and Bangladesh showed higher case fatality rates compared to other countries in the region. In the study of Sreedharan et al., it was stated that the reason for the low number of positive cases reported in low and low middle-income countries may be underreporting of Covid-19 (C-19) positive cases and insufficient number of tests[4].

The results of many studies show that following the hygiene rules in the P has a significant impact on the spread of the disease and the decrease in death rates. However, studies on the effect of education level and sociodemographic characteristics of the society on compliance with hygiene rules are few and the results are not clear.

For this reason, in our study, the effects of the education level and sociodemographic characteristics of the society on the rate of compliance with hygiene rules were investigated in the TRNC.

## Material Methods

The study universe of the research is consists of TRNC citizens. A sample group of 308 people was determined from this research universe and 308 people who agreed to participate in the study voluntarily in the survey questionnaire. The adequacy of this sample obtained was evaluated in the context of the statistical analysis method to be used in the study.

An online survey tool was used to collect the data needed in the research. The questionnaire form was prepared to measure how the participants affected the P hygiene.

IBM SPSS Package Program was used for the reliability and validity studies of the 5-point Likert type questionnaire developed for the purpose of the research, and the Cronbach Alpha coefficient of the scale developed with this tool was calculated, thus the reliability and validity degrees of the scale were determined.

The analyzes in the study were made using the SPSS package program.

The compatibility of the data with normal distribution was examined with the Kolmogorov-Smirnov and ShapiroWilk test.

For independent group comparisons of continuous variables, Mann Whitney U test was used when there were two independent groups and Kruskal Wallis test was used when there were more than two independent groups. For the reliability analysis of the scales used in the research, the internal consistency coefficient 'Cronbach's Alpha' was calculated. While analyzing the relationship between continuous variables for the scales used in the research, Spearman rank correlation coefficient was used.

First level confirmatory factor analysis was performed to test the construct validity of the P hygiene scale. While testing the factor structure with confirmatory factor analysis, coefficients of fit and factor loads were evaluated.

Kolmogorov-Smirnov and Shapiro-Wilk tests were performed to determine whether the P hygiene scale and sub-dimensions scores were normally distributed, and it was concluded that the distribution of the scale score was not normal. According to these results,

non-parametric tests Mann-Whitney U and Kruskal Wallis were used in difference analysis ($p<0.05$).
Social media platforms and digital communication applications were used to deliver the questionnaires to the determined sample.
The survey form was tried to be delivered to the participants who formed the sample through social media and digital communication applications that were transferred to the digital environment with the survey management system called Google Forms. The online questionnaire form was used so that the participants could easily answer it. When the participants completed the survey and clicked on the finished option, the survey form was automatically recorded in the database in excel format.
The prepared questionnaire consists of two parts.
In the first part of the study, the questionnaire consisting of gender, age, place of residence, social security, marital status, education level, home, residence, living environment, job, income level, alcohol use, smoking, chronic diseases and walking aids. There are 15 sociodemographic questions.
In the second part of the study, a 5-point Likert scale type question containing 18 statements to measure the relationship between the pandemic and hygiene was prepared to ask the participants about their thoughts on the hygiene of the P. In the P hygiene scale, a total of 18 statements were included in 4 sub-dimensions (mask, social distance and hand hygiene behaviors dimension 8, home hygiene dimension 4, hygiene behaviors changed with the pandemic 4 and shopping hygiene behaviors dimension 2). This section consists of 18 statements and a 5-point Likert scale was used(1=Never, 2=Sometimes, 3=Sometimes, 4=Often, 5=Always).

## Results

The sociodemographic characteristics of the volunteers participating in our study are shown in (Table 1) and (Figure 1).

Table 1. Sociodemographic characteristics of the participants.

| **Sociodemographic Characteristics (n=308)** | **Number (n)** | **Percent (%)** |
|---|---|---|

| | | | |
|---|---|---|---|
| **Sex** | Famale | 170 | 55,2 |
| | Male | 138 | 44,8 |
| **Age** | 20-30 | 105 | 34,1 |
| | 31-40 | 76 | 24,7 |
| | 41-50 | 59 | 19,2 |
| | 51-60 | 41 | 13,3 |
| | 61-65 | 15 | 4,9 |
| | 65+ | 12 | 3,9 |
| **Living Place** | Metropolis | 167 | 54,2 |
| | City | 83 | 26,9 |
| | Country | 49 | 15,9 |
| | Village | 9 | 2,9 |
| **Social Security** | Nope | 46 | 14,9 |
| | Special İnsurance | 44 | 14,3 |
| | Social Security İnstituon | 218 | 70,8 |
| **Marital Status** | Married | 177 | 57,5 |
| | Single Wife/Husband | 106 | 34,4 |
| | Decased Divorced | 5 | 1,6 |
| | | 20 | 6,5 |
| **Level of Education** | Primary school and below | 16 | 5,2 |
| | Middle school student | 6 | 1,9 |
| | High school graduate | 78 | 25,3 |
| | Graduated from a Universty | 208 | 67,5 |
| **The house she/he lived in** | Apartment Private | 223 | 72,4 |
| | Guesthouse- hotel | 80 | 26,0 |
| | | 5 | 1,6 |
| | | | |
| **House of Stay** | His own | 140 | 45,5 |
| | familial | 81 | 26,3 |
| | Rent | 87 | 28,2 |
| **Living Environment** | Alone with | 116 | 37,7 |
| | his wife | 62 | 20,1 |
| | With his wife and children | 125 | 40,6 |
| | with the caregiver | 5 | 1,6 |
| **Work** | Not working | 72 | 23,4 |
| | Retired desk | 54 | 17,5 |
| | job | 129 | 41,9 |
| | physical work | 53 | 17,2 |
| **Monthly income** | **Below Minimum** | **40** | **13,0** |
| | **WageMinimum wageTwice** | **99** | **32,1** |
| | **the Minimum Wage>3** | **112** | **36,4** |
| | **Times Minimum Wage** | | |

| | | | |
|---|---|---|---|
| | | **57** | **18,5** |

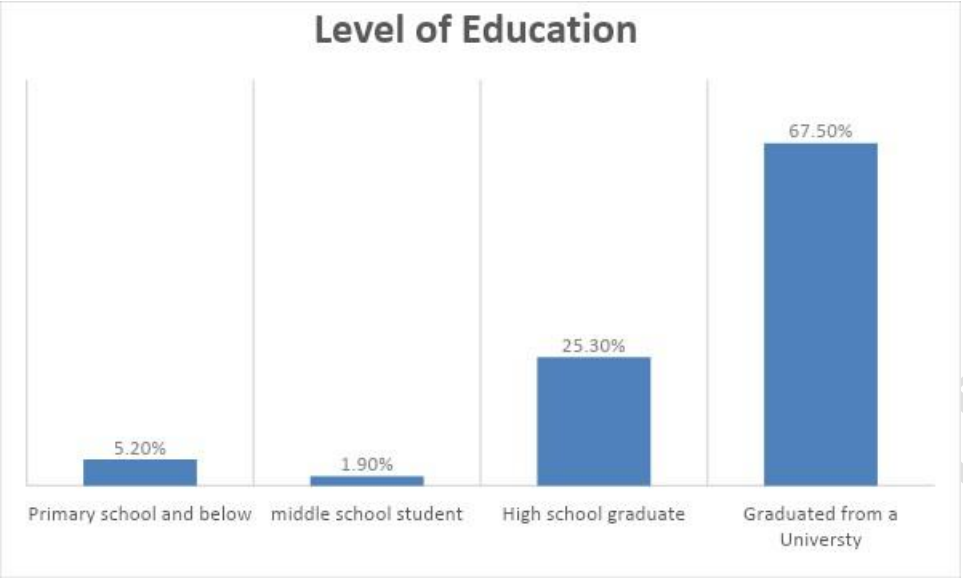


Figure 1. Educational status of the participants.

The health-related characteristics of the volunteers participating in our study are shown in (Table 2) and (Figure 2).

Table 2. Health-related characteristics of the participants.

| **Health-related features (n=308)** | | **Number (n)** | **Percent (%)** |
|---|---|---|---|
| **Alcohol Use** | Nope | 146 | 47,4 |
| | Rarely | 98 | 31,8 |
| | 1 glass per week | 45 | 14,6 |
| | 1 glass per day | 19 | 6,2 |
| **Smoking** | Nope | 144 | 46,8 |
| | forwent | 17 | 5,5 |
| | here and there | 30 | 9,7 |
| | 1 pack per week | 30 | 9,7 |
| | 1 pack per day | 87 | 28,2 |
| **Chronic Diseases** | Nope | 260 | 84,4 |
| | Hypertension | 24 | 7,8 |
| | Diabetes | 19 | 6,2 |
| | hyperlipidemia | 5 | 1,6 |

| | | | |
|---|---|---|---|
| **Aid to Walk Vehicle** | **Nope** | **303** | **98,4** |
| | **Wheelchair** | **5** | **1,6** |

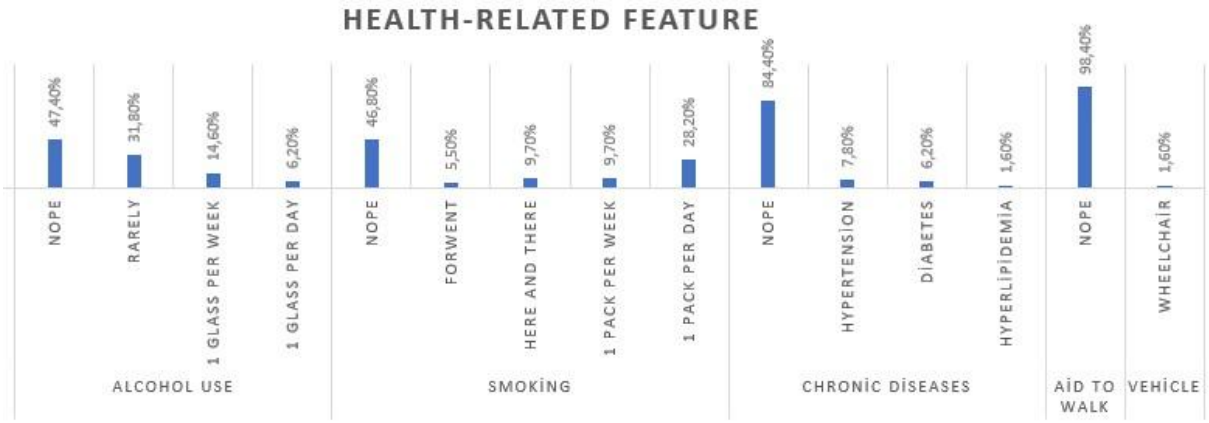


Figure 2. Health –related status of the participants.



The rates of using masks, hand hygiene and social distancing were higher in volunteers with social security than those without (p=0.039). (Table 3).

**Table 3.** Estimates of the Kruskal test according to how the participants' Covid-19 pandemic world sub-dimensions were evaluated social security.

| | **Social Security** | **n** | **Medyan (min-max)** | **Ki kare** | **p** | **Dual comparisons** |
|---|---|---|---|---|---|---|
| **Mask, social distancing and hand hygiene behaviors** | a.Nope<br>b.Special İnsurance<br>c.Social Security İnstituon | 46<br>44<br>218 | 4,25 (1,38-5,00)<br>4,50 (3,13-5,00)<br>4,63 (1,00-5,00) | 6,498 | **0,039** | a-b p=0,104<br>b-c p=0,012<br>a-c p=0,572 |
| **Household hygiene behaviors** | a.Nope<br>b.Special İnsurance<br>c.Social Security İnstituon | 46<br>44<br>218 | 4,00 (1,00-5,00)<br>4,00 (1,75-5,00)<br>4,25 (1,00-5,00) | 0,985 | 0,611 | |
| **Changing hygiene behaviors with the pandemic** | a.Nope<br>b.Special İnsurance | 46<br>44<br>218 | 3,88 (1,25-5,00)<br>4,00 (2,00-5,00)<br>4,00 (1,00-5,00) | 5,416 | 0,067 | |

| | | | | | | |
|---|---|---|---|---|---|---|
| | c.Social Security İnstituon | | | | | |
| **Shopping hygiene behaviors** | a.Nope<br>b.Special İnsurance<br>c.Social Security İnstituon | 46<br>44<br>218 | 4,00 (1,00-5,00)<br>3,50 (1,00-5,00)<br>4,00 (1,00-5,00) | 0,212 | 0,900 | |

According to the marital status variable, shopping hygiene behaviors were found to be higher in married participants than in single, widowed and divorced participants (P=0.028)(Table 4).

**Table 4.** Findings regarding the Kruskal Wallis test results according to the marital status variable of the Covid-19 pandemic hygiene sub-dimensions of the participants.

| | **Marital Status** | **n** | **Medyan (min-max)** | **Ki kare** | **p** | **Dual comparisons** |
|---|---|---|---|---|---|---|
| **Mask, social distancing and hand hygiene behaviors** | a.Married<br>b.Single<br>c.Wife/Husband Decased<br>d.Divorced | 177<br>106<br>5<br>20 | 4,63 (2,25-5,00)<br>4,50 (1,00-5,00)<br>4,88 (4,38-5,00)<br>4,56 (3,13-5,00) | 5,122 | 0,163 | |
| **Household hygiene behaviors** | a.Married<br>b.Single<br>c.Wife/Husband Decased<br>d.Divorced | 177<br>106<br>5<br>20 | 4,25 (1,25-5,00)<br>4,00 (1,00-5,00)<br>4,75 (3,75-5,00)<br>4,13 (1,75-5,00) | 5,296 | 0,151 | |
| **Changing hygiene behaviors with the pandemic** | a.Married<br>b.Single<br>c.Wife/Husband Decased<br>d.Divorced | 177<br>106<br>5<br>20 | 4,00 (1,25-5,00)<br>4,00 (1,00-5,00)<br>4,25 (2,75-5,00)<br>4,25 (2,00-5,00) | 4,732 | 0,192 | |
| **Shopping hygiene behaviors** | a.Married<br>b.Single | 177<br>106<br>5 | 4,00 (1,00-5,00)<br>3,50 (1,00-5,00)<br>5,00 (4,00-5,00) | 9,119 | **0,028** | a-b p=0,260 b-c p=0,018<br>a-c p=0,041 b-d p=0,198<br>a-d p=0,058 c-d p=0,012 |

| | | | | | | |
|---|---|---|---|---|---|---|
| | c.Wife/Husband Decased<br>d.Divorced | 20 | 3,00 (1,00-5,00) | | | |

The findings obtained in our study were found to be statistically more significant than the individuals who work at desk jobs, their home hygiene, shopping hygiene, and hygiene behaviors that changed with the pandemic (p=0.010), (p=0.037) (p=0.037)(Table 5).

**Table 5.** Findings regarding the Kruskal Wallis test results of the participants' Covid-19 pandemic hygiene sub-dimensions according to the job variable.

| | **Work** | **n** | **Medyan (min-max)** | **Ki kare** | **p** | **Dual comparisons** |
|---|---|---|---|---|---|---|
| **Mask, social distancing and hand hygiene behaviors** | a.Not working<br>b.Retired<br>c.desk job<br>d.physical work | 72<br>54<br>129<br>53 | 4,50 (1,38-5,00)<br>4,75 (3,13-5,00)<br>4,50 (1,00-5,00)<br>4,63 (2,50-5,00) | 5,073 | 0,167 | |
| **Household hygiene behaviors** | a.Not working<br>b.Retired<br>c.desk job<br>d.physical work | 72<br>54<br>129<br>53 | 4,13 (1,00-5,00)<br>4,25 (2,75-5,00)<br>4,00 (1,00-5,00)<br>4,50 (2,00-5,00) | 11,265 | **0,010** | a-b p=0,537 b-c p=0,009<br>a-c p=0,049 b-d p=0,644<br>a-d p=0,344 c-d p=0,009 |
| **Changing hygiene behaviors with the pandemic** | a.Not working<br>b.Retired<br>c.desk job<br>d.physical work | 72<br>54<br>129<br>53 | 4,00 (1,25-5,00)<br>4,25 (2,00-5,00)<br>3,75 (1,00-5,00)<br>4,00 (1,25-5,00) | 8,220 | **0,042** | a-b p=0,111 b-c p=0,007<br>a-c p=0,482 b-d p=0,506<br>a-d p=0,366 c-d p=0,064 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Shopping hygiene behaviors** | a.Not working<br>b.Retired<br>c.desk job<br>d.physical work | 72<br>54<br>129<br>53 | 4,00 (1,00-5,00)<br>4,00 (1,00-5,00)<br>3,00 (1,00-5,00)<br>4,00 (1,00-5,00) | 8,504 | **0,037** | a-b p=0,186 b-c p=0,008<br>a-c p=0,154 b-d p=0,463<br>a-d p=0,655 c-d p=0,066 |

Although no significant results were found in our study regarding hand hygiene, social distance, mask use, shopping hygiene and home hygiene of individuals working for minimum wage, statistically significant results were obtained in the sub-dimension of hygiene behaviors that changed with the pandemic (p=0.007)(Table 6)

**Table 6.** Estimates of the Kruskal Wallis test according to the income level of the participants' Covid-19 pandemic hygiene sub-dimensions.

| | **Monthly income** | **n** | **Medyan (min-max)** | **Ki kare** | **p** | **Dual comparisons** |
|---|---|---|---|---|---|---|
| **Mask, social distancing and hand hygiene behaviors** | a.Below Minimum<br>b.WageMinimum wage Twice<br>c.The Minimum Wage>3 Times<br>d.Minimum Wage | 40<br>99<br>112<br>57 | 4,56 (1,38-5,00)<br>4,50 (1,88-5,00)<br>4,50 (1,00-5,00)<br>4,63 (2,25-5,00) | 6,162 | 0,104 | |
| **Household hygiene behaviors** | a.Below Minimum<br>b.WageMinimum wage Twice<br>c.The Minimum Wage>3 Times<br>d.Minimum Wage | 40<br>99<br>112<br>57 | 4,00 (1,00-5,00)<br>4,25 (1,75-5,00)<br>4,00 (1,00-5,00)<br>4,25 (2,25-5,00) | 5,943 | 0,114 | |
| **Changing hygiene behaviors with the pandemic** | a.Below Minimum<br>b.WageMinimum wage Twice<br>c.The Minimum Wage>3 Times<br>d.Minimum Wage | 40<br>99<br>112<br>57 | 3,50 (1,25-5,00)<br>4,25 (1,25-5,00)<br>3,75 (1,00-5,00)<br>3,75 (1,25-5,00) | 11,971 | **0,007** | a-b p=0,009 b-c p=0,004<br>a-c p=0,367 b-d p=0,166<br>a-d p=0,068 c-d p=0,232 |
| **Shopping hygiene behaviors** | a.Below Minimum<br>b.WageMinimum wage Twice<br>c.The Minimum Wage>3 Times<br>d.Minimum Wage | 40<br>99<br>112<br>57 | 3,75 (1,00-5,00)<br>4,00 (1,00-5,00)<br>4,00 (1,00-5,00)<br>3,00 (1,00-5,00) | 2,292 | 0,514 | |

In our study, no statistically significant relationship was found between the place of residence and mask use, social distance and hand hygiene behaviors dimension, home hygiene dimension, behaviors changed with the pandemic, and shopping hygiene dimension(p=0.459),(p=0.711),(p=0.982).

According to the results we obtained, there was no statistically significant difference between the rates of using masks, complying with social distance, complying with the rules of hand hygiene, home hygiene and shopping hygiene according to age variables(p=0.066).

According to the results we obtained, according to the gender variables, there was no statistically significant difference between the rates of using masks, complying with social distance, hand hygiene, home hygiene and shopping hygiene rules(p=0.198),(p=0.059).

In our research, no statistically significant result was found between the number of individuals in the living environment and the changing hygiene behaviors with mask, social distance, hand hygiene behaviors, shopping hygiene, home hygiene, pandemic(p=0.459),(p=0.711),(p=0982),(p=0.166).

In the study we conducted in the TRNC, no statistically significant result was found between the Covid-19 pandemic hygiene scale sub-dimensions regarding smoking, chronic disease and having a walking aid(p=0.236),(p=0.139),(p=0.324),(p=0.087).

In our research we conducted in the TRNC, no statistically significant relationship was found between education level and mask use, social distance and hand hygiene behaviors, home hygiene dimensions, behaviors changed with the pandemic, and shopping hygiene dimensions(p=0.300),(p=0.128),(p=0.202),(p=0.600) (Table 7) (Figure 3).



**Table 7**. Findings regarding the Kruskal Wallis test results according to the educational status variable of the Covid-19 pandemic hygiene sub-dimensions of the participants

| | **Level of Education** | **n** | **Medyan (min-max)** | **Ki kare** | **p** |
|---|---|---|---|---|---|

| | | | | | |
|---|---|---|---|---|---|
| **Mask, social distancing and hand hygiene behaviors** | a.Primary school and below<br>b.Middle school student<br>c.High school graduate<br>d.Graduated from a Universty | 16<br>6<br>78<br>208 | 4,44 (2,38-5,00)<br>4,13 (2,75-5,00)<br>4,63 (1,00-5,00)<br>4,50 (1,38-5,00) | 3,663 | 0,300 |
| **Household hygiene behaviors** | a.Primary school and below<br>b.Middle school student<br>c.High school graduate<br>d.Graduated from a Universty | 16<br>6<br>78<br>208 | 4,34 (2,00-5,00)<br>4,25 (2,75-5,00)<br>4,25 (1,00-5,00)<br>4,00 (1,00-5,00) | 5,687 | 0,128 |
| **Changing hygiene behaviors with the pandemic** | a.Primary school and below<br>b.Middle school student<br>c.High school graduate<br>d.Graduated from a Universty | 16<br>6<br>78<br>208 | 4,13 (2,00-5,00)<br>3,75 (1,25-4,50)<br>4,13 (1,00-5,00)<br>4,00 (1,25-5,00) | 4,615 | 0,202 |
| **Shopping hygiene behaviors** | a.Primary school and below<br>b.Middle school student<br>c.High school graduate<br>d.Graduated from a Universty | 16<br>6<br>78<br>208 | 4,00 (1,00-5,00)<br>3,50 (1,00-5,00)<br>4,00 (1,00-5,00)<br>3,50 (1,00-5,00) | 1,868 | 0,600 |



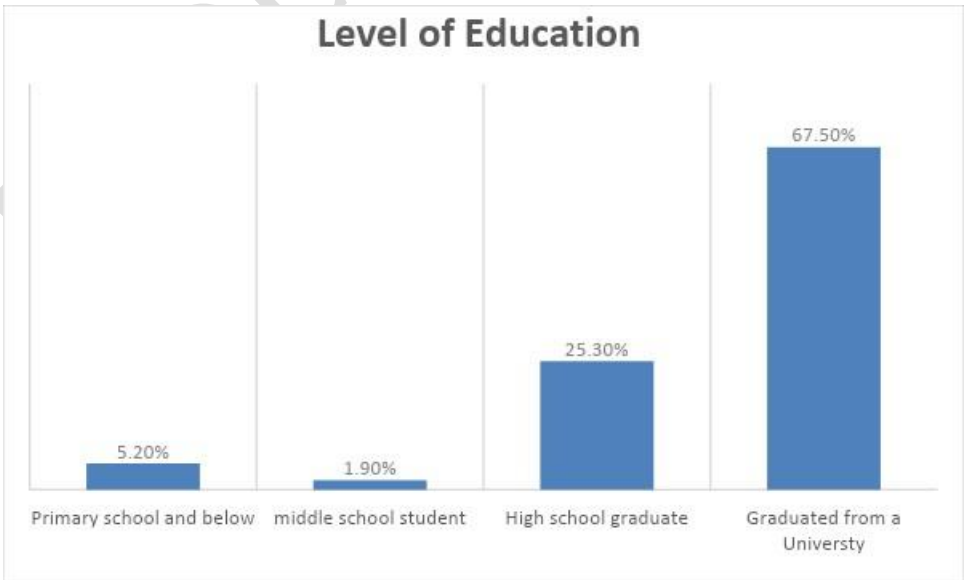

Figure 3. The effects of education levels on the rate of compliance with hygiene rules in the TRNC.

## Discussion

According to the results we obtained in our study, the rate of university graduates was found to be quite high(67.5%) among the volunteers who participated in our study in TRNC(Table 7) (Figure 2).However, no significant relationship was found between education level and applying with hygiene rules on P in TRNC (Table 7), (Figure 3). Nevertheless, it was found that there were statistically significant relationships between some sub-variables and the rates of applying with some hygiene rules.

The rate of applying with social distance, mask and hand hygiene rules was found to be higher in volunteers who were affiliated with any social security institution (p=0.039) (Table 3). One reason for this may be that health awareness is lower in individuals without social security than in individuals with social security[5]. In line with our results, there are some studies in which health-related expenditures of individuals with health insurance are higher than those without health insurance during the P period. These expenditures include protective equipment, vitamin drugs, hygiene materials. It has been found that individuals with health insurance have a lower level of knowledge and behavior about preventive behaviors against P compared to individuals who do not have health insurance[6,7].

According to the results of our research, according to the marital status variable, shopping hygiene behaviors were found to be higher in married participants than in single, widowed and divorced participants (P=0.028) (Table 4).

When the literature was searched, it is thought that the practice of shopping hygiene in studies that have a significant relationship with the marital status of the individuals may be due to the fear of being infected with the virus in the closed areas where shopping is done, and the fear of infecting their partners with the awareness of responsibility towards their partners[8,9]. Married individuals may be encouraged to practice shopping hygiene by their spouses.

It was observed that other variables (hand hygiene, mask use, compliance with social distance) were not affected in the TRNC in relation to marital status (Table 4). When the literature is searched, results supporting our study are seen. The recommended hygiene behaviors during the current P period included personal practices to

protect individuals and marital status variable may not have affected the behaviors[8,9].

The findings obtained in our study were found to be statistically more significant than those who do not work, retire and do physical work (p=0.010), (p=0.037), (p=0.037) 0.042)(Table 5). It is possible that individuals have demonstrated hygiene practices in the home environment, such as ventilation of the office environment, disinfection of frequently used tools such as desks and computers, in order to protect themselves in the desk office environment. There is a study that determined that working individuals show low home hygiene due to the inability to spare time for home hygiene[10].

In our study, although no significant results were found regarding hand hygiene, social distance, mask use, shopping hygiene and home hygiene of individuals working with minimum wage, statistically significant results were obtained in the sub-dimension of hygiene behaviors that changed with the P(p=0.007).The reason for this result is the finding that the use of contactless payment method negatively affects individuals whose income level is below the minimum wage in the study conducted by Dayı, which supports the significant result found in our study[11].Individuals working with the minimum wage may have shown contactless payment behavior by adapting better to the contactless payment behavior.

In individuals who use 1 glass of alcohol a day, hand hygiene, mask use and social distance behavior, shopping hygiene, home hygiene and hygiene behaviors that change with the P were found to be statistically higher than individuals who do not use alcohol, rarely use alcohol and use 1 glass of alcohol a week(p=0.003).

There has been an increase in addiction-related behaviors such as alcohol use and smoking during the P. Despite the warnings of the World Health Organization, a lot of information has spread on social platforms that alcohol and tobacco products are protective against the C-19 virus. In the study conducted by Luk et al., 19% of the individuals participating in the study reported that “they have seen claims that using alcohol from social networking sites can protect against C-19”.

The reason for this increase was determined to be due to people's belief that alcohol consumption during the P period is protective against C-19.

There may be many reasons for the increase in the use of addictive substances during the P period. In literature studies, the reasons for this situation are associated with having wrong information about alcohol, loneliness, excess free time and depression[13]. No statistically significant results were found regarding smoking and compliance with hygiene rules. Although this result is supported by some studies[14], there are also studies showing that smokers have a higher level of knowledge and practice than non-smokers[15]. According to the results obtained in our study, in studies where the rate of mask use and social distance application of smokers is higher, the participants want to protect themselves from being infected with the virus by keeping a distance from other individuals because they cannot use a mask while smoking in the areas where they smoke. Being aware of being in the risk group for the disease may have increased the need for mask use. In our study in the TRNC; according to the age variable, no significant relationship was found for mask use, social distance and hand hygiene behaviors dimension, home hygiene dimension, behaviors changed with the P and shopping hygiene dimension. When the literature was searced, there were researchers who obtained results similar to our study[16]. In some studies with different results, poor hygiene practice due to low level of knowledge has been detected by limiting access to information about the P, as a result of lack of information in elderly individuals, the increase in age and the emergence of hearing and vision disorders, the low level of knowledge of individuals with advanced age level [17,18,19,20].There was no significant relationship between the social security of the participants and the factor of home hygiene, the dimensions of behaviors changed with the P, and the dimension of shopping hygiene. In our research we conducted in the TRNC, no statistically significant relationship was found between the place of residence and the use of masks, social distance and hand hygiene behaviors, home hygiene factor, behaviors changing with the P, and shopping hygiene factor.

When the relevant literature was searched, Özşahin et al. investigated the place of residence and the attitude towards P hygiene rules, and no statistically significant results were found, similar to our study[21].In another study; In order to measure the applying of individuals with general hygiene rules such as personal hygiene, food hygiene, hand hygiene, questions similar to the questions asked in our study, such as hand washing frequency, home cleaning frequency, behavior of wiping the outer surfaces of vegetables and fruits were asked but not detected[22].

When the literature is searched, it is thought that the reason for the high level of mask use, social distance and hand hygiene behavior in individuals living in urban areas may be the education level of individuals in reaching sufficient information about the P and the advantage of internet access in reaching information. Individuals living in rural areas generally have low education levels, limited internet access and use, and health promotion is rarely performed, so prevention and control efforts in rural areas are considered to need improvement[23].

In the P, the borders between countries were closed within the scope of the measures taken during the P period, more than the general population, compared to the general population, and many people could not reach their jobs and experienced economic difficulties. These difficulties have also affected immigrants. In the study of Blair et al., social distance, mask use and prevalence of hand washing behavior were associated with education level and immigration. This study supports our result [24,25,26].In the research conducted by Bui, it was determined that more than 90% of immigrants comply with preventive measures. However, when immigrants experience C-19 symptoms, the rate of compliance with health institutions was found to be lower than other participants[27]. It is thought that individuals living in guest-houses or hotels live in public areas, have come to the TRNC to work and are worried about being infected with C-19 because they live far from their country, and difficulties in accessing health may be due to insecurity.

In a study conducted in Ethiopia, they evaluated the relationship between demographic variables and preventive practices such as hand hygiene, mask use, and social distancing behavior. As a result of this evaluation, it was concluded that unemployed individuals showed 3.6 times less handwashing hygiene behavior compared to other occupational groups, and private sector employees and civil servants avoided risky behaviors such as shaking hands more (Table 8) (Figure 4.5)[28] .

In our research, no statistically significant result was found between the number of individuals in the living environment and the changing hygiene behaviors with mask, social distance, hand hygiene behaviors, shopping hygiene, home hygiene and P.

In the study of Nwonwu et al., no significant results were found with applying with the rules of hygiene and the number of individuals living at home[29].In another study, the number of individuals in the living environment of participants' hand hygiene, mask use, behavior of complying with social distance, home hygiene, shopping hygiene and hygiene behaviors that changed with the P were investigated, and no significant results were found similar to our study[30]. In the study we conducted in the TRNC, no statistically significant results were found between the P hygiene scale sub-dimensions regarding the smoking, chronic disease, and possession of walking aids.In the study of Tang et al., the use of face masks, compliance with social distance rules, hand hygiene, house cleaning and air-conditioning behavior were analyzed with the variable of individuals with chronic diseases, and no significant results were found similar to our research[31].

In the study conducted by Çiçek et al., the hand-washing behavior of individuals with chronic diseases was determined at a high level, and statistically significant results could not be obtained with individuals with chronic diseases regarding home hygiene, shopping hygiene, mask use, and compliance with social distance[9]. In our study conducted in TRNC, no statistically significant relationship was found between education level and mask use, social distance and hand hygiene behaviors, home hygiene, P-changed behaviors, and shopping hygiene (Table 7) (Figure 3). Similar and opposite results were found

in the literature with the behaviors of hand hygiene, mask use, and compliance with social distance. The reason for these differences may be the fact that the individuals surveyed are from different countries and different cultures. In addition to these factors, the lack of meaningful results with the level of education is due to the fact that practices such as the use of masks and curfews during the P were made compulsory by the health authorities and the public was informed about the C-19 preventive measures with tools such as social media, television, and preventive application posters, may be due to increased awareness in individuals. In an online study, the use of masks by individuals with a low level of education was found to be higher than individuals with a high level of education. Researches have evaluated this result as the behavior of individuals with low education level, "to comply with compelling rules in the image"[9]. The reason why individuals do not practice hand hygiene was determined as forgetting due to not adopting the habit of hand washing during the day, and not knowing the importance of hand washing in the current P situation and not knowing the appropriate hand washing behavior[32].In online studies conducted in Saudi Arabia and Lebanon, a statistically significant relationship was not found between education level and handwashing behavior, similar to our study in the TRNC[33,34,35].

Table 8. The relationship between education level and compliance with hygiene rules in some countries in the Covid-19 pandemic.

| | **UNDER HIGH SCHOOL EDUCATION Percent (%)** | **HIGH SCHOOL EDUCATION Percent (%)** |
|---|---|---|
| **PALESTINE** | 16,6 | 63,8 |
| **AFRICA** | 87,1 | 88,3 |
| **LEBAN** | 77,2 | 77,6 |
| **SERBIA** | 76,3 | 96,7 |
| **USA** | 5,0 | 14,0 |
| **SAUDI ARABIA** | 83,5 | 84,0 |

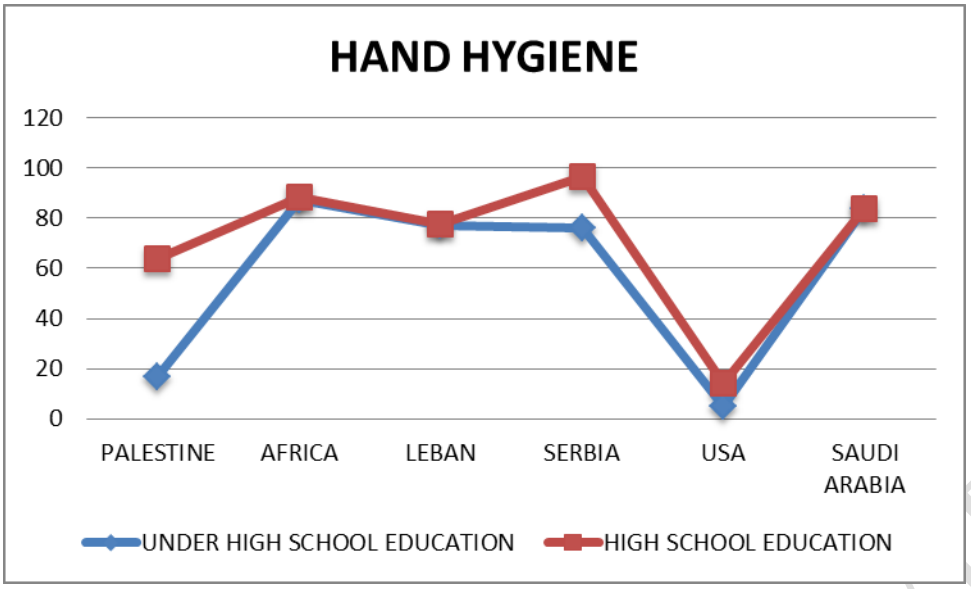


Figure 4. The relationship between education level and hand hygiene in some countries during the Covid-19 pandemic.

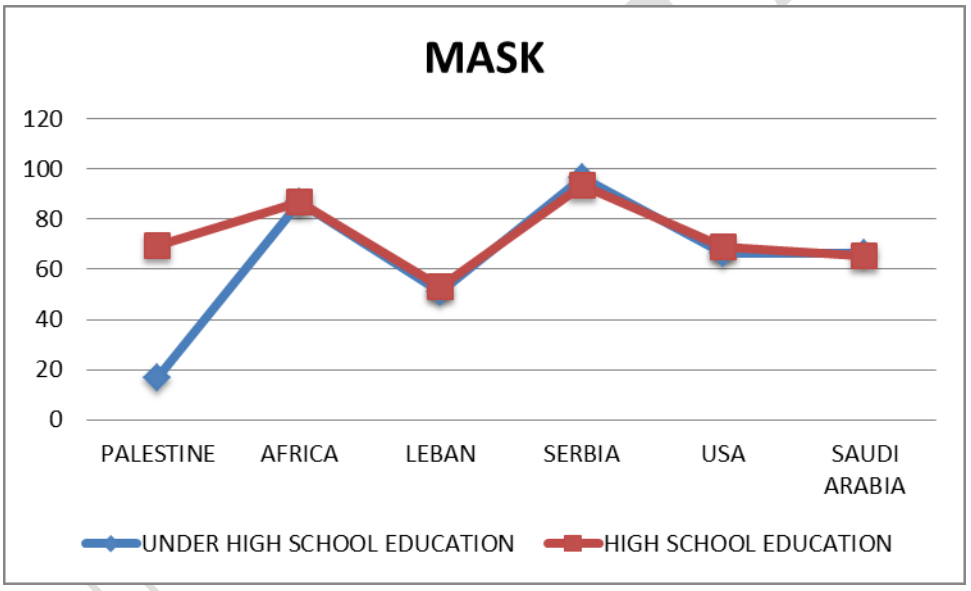


Figure 5. The relationship between education level and mask use in some countries during the Covid-19 pandemic.

The recommendations of the World Health Organization(WHO) and the importance of hygiene have increased the level of knowledge in people through mass media, social media, digital media and classical media, and have led to awareness in the practice of house cleaning in

people who stay in their homes for a long time during the P process[38,39,40,41].

In the study we conducted in the TRNC, no significant results were obtained between home hygiene and education level. The WHO frequently mentioned the importance of hygiene during the P process, and a risk perception was created in almost every segment of the P. In general, people preferred to stay away from socializing and stay at home. In a study, it was concluded that the behavior of keeping products in vinegar water after shopping was 1.5 times higher in participants with low education level compared to participants with high education level [30]. In addition to hand washing, mask use and social distancing, measures such as changing clothes, taking a shower, wiping the surface of food may be less effective in preventing C-19. However, the implementation of these behaviors can be an indicator of awareness in compliance with hygiene rules[42]. Similar to our study, no statistically significant relationship was found between education level and shopping hygiene in studies conducted in the United States, Saudi Arabia and Lebanon[34,36].The behavior of individuals using contactless payments during the pandemic period is in a significant relationship with the level of education. Individuals with university and higher education tend to use contactless payments more than other education levels during the P period[11]. In the study conducted by Islam et al., participants with high school or higher education level stated that they washed their clothes when they came home from outside[42]. One of the habits that changed during the P period was the use of contactless payments. In our study, they were asked whether they used contactless cards under the hygiene scale dimension of changing hygiene behaviors during the P period. However, there was no significant result related to education level.

In the research we conducted in the TRNC, the education level of the participants, gender, place of residence, smoking, living environment, home, chronic disease, use of walking aid and education status, hand hygiene, mask use and social distance behavior, shopping hygiene, home No statistically significant result was found according to the hygiene behavior and hygiene behaviors that changed with the P. Our

study was carried out as an online survey, and people who did not have internet access and were illiterate could not be reached.
In addition to these factors, the lack of meaningful results with the level of education is due to the fact that practices such as the use of masks and curfews during the P were made compulsory by the health authorities and the public was informed about the C-19 preventive measures with tools such as social media, television, and preventive application posters. may be due to increased awareness in individuals. More comprehensive similar studies are needed in order to give more precise conclusions on this subject.

## Conclusion

The level of compliance with hygiene rules is associated with sociodemographic characteristics. In the research we have done in the TRNC, sociodemographic factors have been determined that the level of compliance with the hygiene rules is low in the P.
Education programmes should be planned for the development of hand hygiene, mask use and social distancing behaviors for men, individuals who do not have social security or have private insurance, and individuals who do not live in public areas such as dormitories and hotels in the TRNC and stay in a unique house.
There is a need to inform the workers who do not work in any job, who are retired and who work in a physical job in the TRNC, about the hygiene rules that they should apply at home and while shopping, to reduce the risk of contamination.



### Ethical approval

The Health Sciences Ethical Committee of Girne American University gave approval to this study.

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