Deanship of Graduate Studies
Al-Quds University

Assessing Preventing Behaviors of COVID-19 among Palestinian High School Students Using Health Belief Model

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M.Sc. Thesis

Jerusalem – Palestine

1443 - 2022

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A thesis submitted in partial fulfillment of requirement for the degree of Master of Public Health - Deanship of Graduate studies - Al-Quds University

1443 – 2022

Deanship of Graduate Studies
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Thesis Approval

Assessing Preventing Behaviors of COVID-19 among Palestinian High School Students Using Health Belief Model

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Jerusalem – Palestine

1443 / 2022

Dedication

I dedicate this work

To my beloved family for their seiner love and ever-present support of my endeavors towards learning

To my grandfathers (Ahmad and Khalil) RIP, I hope I had a chance to read this dedicate to both of you.

To my friends who surrounded me with prayers and believed in me

To all those from backstage who encouraged and helped me

Eman Mousa AlBarbarawi

Declaration

I certify that this thesis submitted to the degree of master is the result of my own research, except where otherwise acknowledged, and that this thesis or any of its parts has not been submitted for higher degree to any other university or institution.

Signature:

Eman Mousa Ahmad AlBarbarawi

Date: 16/01/2022.

Acknowledgement

I would like to give my warmest thanks to my supervisor "**Dr. Maha Husseini**", her guidance and advice carried me through all the stages of writing my thesis.

To all my instructors at Al-Quds University who spared no effort in educating us and expanding our perceptions.

I extend my thankfulness to the Directorate of Education in North Hebron, for their cooperation. To my second family there "School-Health department", especially **Ms. Hakema Za'arir**; thanks for all the support and kindness, I really do appreciate it.

To my dearest **father**, you always believed in me and supported me to be the best, and reminds me "إن الله لا يُضيع أجر من أحسن عملاً".

To my **mother**, who never gave up to convince me to complete the path, actually, to start it too. Mama, you always remind me of Bukowski saying "when I look at her, the light goes through me", thank you for all your constant prayers.

To my brother, **Osama**, despite the distances, you always were here. One word from you encourages me to conquer my mountains.

To my sisters;

Wafa and **Shifaa;** my eldest and precious sisters, who always supported and trusted in me.

Alaa, Doaa, and **Batool**; my beloved sisters, my best friends, we went through all that together, you have done a lot for me, words can't express my gratitude.

Thanks for being my sisters, thanks for all the support you have given me.

To my dearest Master colleagues, who made Masters experience full of good memories and smiles, especially to **Alaa Obeyat;** who freely volunteer her time and efforts. I will never forget your kindness, help and encouragement all the time.

Finally, I would like to thank **God**, for letting me through this experience with all the difficulties. I have passed it by your guidance and mercifulness.

Abstract

Background: COVID-19 is spreading rapidly and cause a pandemic in the world. Global efforts have been exerted to prevent the spreading of the disease. Prevention practices is a persistent need due to the opening of schools and returns of students to schools. Therefore, this study aimed to explore the students' preventive behaviors toward COVID-19, using HBM as a conceptual framework, to prevent infection with COVID-19 in order to develop health promotion activities and programs at schools.

Justification: Studying and understanding school students' preventative behaviors toward COVID-19 will help in forming control strategies and health promotion programs of Ministry of Health and other institution. Moreover, it would be reference for intervention plans for schools.

Purpose and objectives: The study aimed to understand the preventive behaviors of seventh to tenth students in North Hebron Directorate of Education schools toward COVID-19. It has four objectives; to assess students' knowledge, practices of behaviors, the preventive behaviors toward COVID-19, and the relationship between socio-demographic variables and preventive behaviors toward COVID-19 using the health belief model.

Methodology: a cross-sectional study using online two-part questionnaire was conducted in the second semester of school year 2020/2021 among seventh to tenth graders enrolled in North Hebron Directorate of Education governmental schools. The study used convenience sampling method. The survey instrument was based on HBM constructs.

Results: the sample consisted of 331 students; 122 (36.9%) are males, and 209 (63.1%) are female participants from 7^{th} to 10^{th} grades. The findings showed that students had a moderate knowledge about COVID-19 and preventive behaviors. The main source of knowledge about COVID-19 instruction was MOH (65.9%), followed by schools/ teachers and social media (42.6%) and (42.3%) respectively. The participants scored high in positive attitudes toward COVID-19 and moderate in behaviors. Moreover, students scored moderate toward Health Belief Model constructs; the highest was the perceived self-efficacy with very high score (M=4.38, SD±0.49). The least was barriers of social distancing with low score (M=2.26, SD±1.18). The univariate and multivariate logistic regression showed that the place of residence, parents work in healthcare professions, perceived susceptibility, perceived severity, and the ability for preventive behaviors (actual actions) had statistical significance on students' preventive behaviors toward COVID-19.

Conclusion and recommendations: Results suggest the need to increase students' knowledge and preventive behaviors using self-efficacy and susceptibility. More studies are needed to explore students' knowledge, and behavior toward COVID-19 as the pandemic still going on and there is no effective solution but preventive behaviors and practices. Decision makers and health related institutions should build strategies and intervention plans to enhance the public preventive behavior toward COVID-19.

Keywords: Knowledge, Behavior, Preventive health behaviors, COVID-19, Health belief model, School-health, students, high school, Palestinian, West Bank.

تقييم السلوكيات الوقائية نحو فيروس كورونا لدى طلبة المرحلة الأساسية العليا الفلسطينيين باستخدام نموذج المعتقد الصحي

إعداد: إيمان موسى البربراوي

إشراف: د. مها الحسيني

الملخص

خلفية الدراسة: إن الانتشار السريع لفيروس كورونا أدى لتحوله إلى وباءٍ عالمي، الأمر الذي عمل على تظافر كل الجهود العالمية لمنع انتشار هذا المرض المقلق بين أوساط المجتمعات. ولعل التجمعات الطلابية في المدارس هي من أكثر الأمور التي خلقت قلقا وتوترا للدول على اختلافها؛ لذلك قامت المؤسسات التعليمية بوضع مجموعة من البروتوكولات الصحية التي يجب على الطلبة الالتزام بها كحاجة ملحة للممارسات الوقائية بسبب عودة الطلبة للمدارس. من هنا هدفت هذه الدراسة إلى استكشاف السلوكيات الوقائية تجاه فيروس كورونا، باستخدام نموذج المعتقد الصحي المستخدم كإطار مفاهيمي، لتقليل الإصابة بفيروس كورونا من ناحية ومن أجل تطوير أنشطة تعزيزية للصحة في المدارس.

المبرر: ستساعد هذه الدراسة على فهم سلوكيات الطلبة الوقائية تجاه فيروس كورونا، من أجل تشكيل استراتيجيات للتحكم بآثار هذا المرض، ولوضع برامج تعزيز الصحة في وزارة الصحة والمؤسسات الأخرى. علاوة على ذلك، ستكون هذه الدراسة مرجعا لخطط التدخل السريع للمدارس في حال انتشار هذا المرض بين صفوف طلبتها.

الغرض والهدف: هدفت الدراسة إلى فهم السلوكيات الوقائية لدى طلبة الصفوف السابع إلى العاشر في مدارس مديرية التربية والتعليم شمال الخليل تجاه فيروس كورونا. عن طريق أربعة أهداف؛ تقييم معرفة الطلاب وممارسات السلوكيات والسلوكيات الوقائية تجاه فيروس كورونا، اضاقة الى معرفة العلاقة بين المتغيرات الاجتماعية والديموغرافية والسلوكيات الوقائية تجاه فيروس كورونا وذلك باستخدام نموذج المعتقدات الصحية.

المنهجية: أجريت دراسة وصفية مقطعية باستخدام استبيان عبر الإنترنت من جزأين في الفصل الدراسي الثاني من العام الدراسي 2021/2020 بين طلاب الصف السابع إلى العاشر المسجلين في المدارس الحكومية التابعة لمديرية التربية والتعليم شمال الخليل. استخدمت الدراسة طريقة العينة المتوفرة، وقد استندت أداة الدراسة على نموذج المعتقد الصحي.

النتائج: تكونت العينة من 331 طالباً وطالبة. حيث 122 (36.9٪) طالبا من الذكور و209 (63.1٪) طالبة من الإناث من الصف السابع إلى العاشر. وقد أظهرت النتائج أن الطلبة لديهم معرفة معتدلة حول فيروس كورونا وحول السلوكيات الوقائية المتبعة للوقاية من هذا المرض. وعند دراسة تلك النتائج تبين أن المصدر الرئيسي لمعرفة الطلبة حول فيروس كورونا كان وزارة الصحة بنسبة (65.9٪)، تليها المدارس / المعلمين ووسائل التواصل الاجتماعي بنسبة (42.6٪) و (42.3٪) على التوالي. سجل المشاركون درجات عالية في المواقف الإيجابية تجاه فيروس كورونا ومتوسطة في السلوكيات. علاوة على ذلك، سجل الطلاب درجات معتدلة تجاه مكونات نموذج المعتقد الصحي؛ حيث كانت أعلى نسبة هي الكفاءة الذاتية المتصورة بدرجة عالية جدًا (M = 4.38، SD ± 0.49). وأقلها كانت حواجز التباعد الاجتماعي بدرجة منخفضة (M = 2.26، SD ± 1.18). أظهر الانحدار اللوجستي أحادي المتغير ومتعدد المتغيرات أن مكان الإقامة، وعمل الآباء في مهن صحية، وإدراك القابلية، وإدراك الخطورة، والقدرة على السلوكيات الوقائية (الإجراءات الفعلية) لها دلالة احصائية في سلوكيات الطلاب الوقائية تجاه فيروس كورونا.

الاعتبارات الأخلاقية: قدم البحث للجنة البحثية بكلية الصحة العامة بجامعة القدس، بعد أن تم الحصول على الموافقة الأخلاقية من مركز جامعة القدس للبحوث والاخلاقيات، كذلك تم الحصول على إذن لإجراء الدراسة من وزارة التربية والتعليم.

الخلاصة والتوصيات: تشير النتائج إلى الحاجة لزيادة معرفة الطلاب والسلوكيات الوقائية باستخدام الكفاءة الذاتية وقابلية التأثر، وهناك حاجة إلى مزيد من الدراسات لاستكشاف معرفة الطلاب ومواقفهم وسلوكهم تجاه فيروس كورونا حيث لا يزال الوباء مستمراً، ولازالت المتحورات لهذا الفيروس في تطور بين يوم وآخر، مع عدم وجود حل فعال للقضاء على هذا المرض سوى من خلال تعزيز السلوكيات والممارسات الوقائية. من هنا وجب على صانعي القرار والمؤسسات ذات الصلة بالصحة بناء استراتيجيات وخطط تدخل سريع لتعزيز السلوك الوقائي العام تجاه فيروس كورونا.

الكلمات المفتاحية: المعرفة، السلوكيات، السلوكيات الصحية الوقائية، فيروس كورونا، نموذج المعتقد الصحي، الصحة المدرسية، الطلبة، الأساسي العليا، فلسطين، الضفة الغربية.

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CDC	**The Centers for Disease Control and Prevention**
CI	**Confidence Interval**
COVID-19	**Coronavirus Disease 2019**
HBM	**Health Belief Model**
HCI	**Household Crowding Index**
MOH	**Ministry of Health**
MOE	**Ministry of Education**
PCBS	**Palestinian Central Bureau of Statistics**
PCR	**Polymerase Chain Reaction**
PMOH	**Palestinian Ministry of Health**
SARS-CoV-2	**Severe Acute Respiratory Syndrome Coronavirus Two**
WHO	**World Health Organization**

Chapter one

Introduction

1.1 Background

At the end of 2019, an infectious disease emerged in Wuhan, China called coronavirus disease 2019 (COVID-19). The pathogen was caused by a novel coronavirus known as severe acute respiratory syndrome coronavirus 2 (SARS-COV-2)(Di Gennaro et al., 2020). The World Health Organization (WHO) has declared the novel coronavirus (COVID-19) outbreak a global pandemic on March 11th, 2020 after recording 118,000 cases of infection in 114 countries and 4,291 deaths (Cucinotta & Vanelli, 2020). The pandemic alarmed the world about the disease severity and showed that developed nor developing countries do not have the enough emergency readiness. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a serious infectious disease affecting human health worldwide. The high morbidity and mortality rate, the progress of the immunity due to infection, the impact on the worldwide healthcare systems and socioeconomic situation in the long-term still not clear (Walsh et al., 2020).

COVID-19 has a highly transmission efficiency with the possibility of transmission by asymptomatic carriers (Ouassou, et al., 2020). Broadly, there are two routs of transmission; directly and indirectly. The direct route is between humans through droplets and respiratory secretions and/or other body fluids and secretions like; feces, saliva, urine, semen, and tears. Indirect transmission may occur through contact with contaminated fomites, surfaces, or objects used by the infected person. It can also be transmitted by asymptomatic individuals. (Karia et al., 2020) The most common symptoms at onset of COVID-19 disease includes; fever, dry cough, fatigue and loss of taste or smell, while other symptoms reported include sputum production, headache, hemoptysis, diarrhea, dyspnea, and lymphopenia (Rothan & Byrareddyb, 2020). The most serious symptoms are difficulty breathing or shortness of breath, loss of speech or mobility, or confusion, and chest pain. According to WHO (2020), an infected person starts showing symptoms after 5–6 days from the infection and it can take up to 14 days. Elder people and people with chronic diseases specially with lung problems are at the highest risk of developing severe symptoms of COVID-19 (Alves et al., 2020).

On March 5th, 2020, the Palestinian Ministry of Health (PMOH) reported that there were seven confirmed cases for COVID-19 in Bethlehem. A state of emergency was declared in the West Bank in the same day with a complete closure of universities, schools, mosques, and churches for one month. To control the pandemic, the government and Ministry of Health has implemented public measures that included population behavior restrictions such as border closures and restricted travel, restrictions on group gatherings, school/child care closures, obligatory working from home and temporary suspension of non-essential health and public services. The government went through reopening and moving gradually from lower to higher risk activities with protection measures adoption and recommendations to use of a mask in public places and transportations, hand hygiene and maintaining social distancing (WAFA, 2020).

The new school year started in September after six months of closure (Kamal, 2020) with more than 1.3 million students from governmental and UNRWA schools returned to their classes in West Bank and Gaza (WAFA, 2020) in three stages; in the beginning twelve graders (Tawjihi), then basic graders (first to forth) then the higher graders (fifth to eleventh) (OCHA, 2020). With highly concern on hygienic practices and following safety guidelines because there were no vaccines for the virus available in Palestine.

Before the beginning of 2020/2021 school year, the "Health and Safety Protocols for Reopening of Schools" was published by Ministry of Education and Ministry of Health (MOE, 2020) based on the guidelines of international health institutions like World Health Organization (WHO) and the Centers for Disease Control and Prevention (CDC) to limit the spread of COVID-19 (AL-QUDS, 2020).

Assessment of students' knowledge and behavior toward COVID-19 and prevention practices have been a persistent need due to the opening of schools and students return to schools, which would raise the cross-infection due to high population at the same area and the silent infection in this age group (WHO, 2021). Davies and others (2020) mentioned in their article that compared to other age groups, those in 10 to 19 years old, 79% of infections with COVID-19 are asymptomatic or paucisymptomatic (subclinical). This raised the risk of infection; students may spread and transmit the virus to other students or staff without knowing that they were infected.

An informed and well-educated community about COVID-19 transmission routs, exposure, symptoms and prevention methods is more disposed to develop positive attitudes toward

preventive measures, which is an indicator of community adoption of the desired behaviors (preventive behaviors) to limit spreading of the virus. This correlation and sequence are the core of two of the most known models in health psychology and are used widely in health-behavior-related studies; the health belief model and the theory of planned behavior. They are widely used in health-psychology studies that investigate population and community attitudes and behaviors toward certain diseases and preventive measures. (Alves et al., 2020).

To clarify factors and determinants of individual's health behavior Sociologists, psychologists, and anthropologists had recommended various health behavior theories and models, one of them was the health belief model (Shahnazi et al., 2020).

The health belief model (HBM) was developed in the 1950s by social public health psychologists Rosenstock, Hochbaum and others, in the United States to understand the reason behind the failure of individuals to participate in screening programs for disease early detection and prevention. (Glanz, et al., 2008)

Over decades, the Health Belief Model has been one of the most commonly used models in health-related behavior education and promotion (Abraham & Sheeran, 2015). It has been applied for health concerns where beliefs are important like prevention and intervention are needed to change the health-related behavior (OBSSR, 2010). Sutton (2008) defined health behavior as "any behavior that may affect an individual's physical health or any behavior that an individual believes may affect their physical health" (Sutton, 2008).

The researcher chose the HBM due to its high predictive power. The model helps to figure out the reason behind individuals' behavior toward preventive services needed in certain situation. In addition, newly it has been used widely in detection like screening, prevention like vaccines and lifestyle behaviors such as smoking and sexual risk behaviors. (OBSSR, 2010).

The core constructs of the HBM are; perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy. The first four were developed as the original tenets of the HBM. The last two were added then by Rosenstock et al (Orji et al., 2012). The model works on individual's personal beliefs or perceptions about a risky behavior or illness and suggest strategies to make actions to decrease its occurrence. Furthermore, behaviors are adopted if the person belief in both; personal threat of an illness or disease and in the effectiveness of the recommended health behavior or action (LaMorte, 2019).

This study investigated the student's preventive behavior toward COVID-19 using (HBM). The researcher chose North Hebron Directorate of Education to apply the study. Which included one city, eight towns and one camp. The study sample was seventh to tenth graders enrolled in governmental schools. Since at this age students could define their attitude, knowledge and behavior toward COVID-19 more accurate.

1.2 Statement of the Problem

The emerged situation due to the rapid spread and transmission of the novel coronavirus in Palestine specially in schools, drew attention to the need to assess the students' beliefs and their preventive behavior toward COVID-19. The raising numbers of incidence and deaths illustrated that there was a gap between people's knowledge and preventive behavior to COVID-19 versus the recommendations. (Qutob & Awartani, 2021)

PCBS (2021 b) mentioned that in March, 30th, less than one-fifth the confirmed Coronavirus cases in Palestinian population were children 18 years or less, (50.8%) were males and (49.2%) were females. (52.7%) of them were between (13-18) (see Figure 1).

Accordingly, there were concerns of a re-lockdown to control the situation. The previous shutdown due to the pandemic made a severe negative economic and social disruption. Also, it had an adverse impact on education (Wong, et al., 2020).

Since "prevention is better than cure", the best means of prevention besides vaccination, is following recommendations of social distancing, hygiene practices and wearing masks to reduce exposure to the infection. (CDC, 2021)

As schools reopened, strict protective measures were in place to protect students, and school staff and community from COVID-19. The reopening gave a chance to empower students to adopt the recommended healthy behaviors to prevent the spread of the virus. Health promotion and disease prevention activities raised awareness about healthy behaviors and prevention measures to facilitate students to adapt recommended behaviors that led to a positive change in the community through health messages and observation learning.

As new COVID-19 pandemic, there were insufficient studies on students' behavior toward COVID-19. There was a need to understand the magnitude of coronavirus related knowledge, and preventive behaviors among students in relation to several factors.

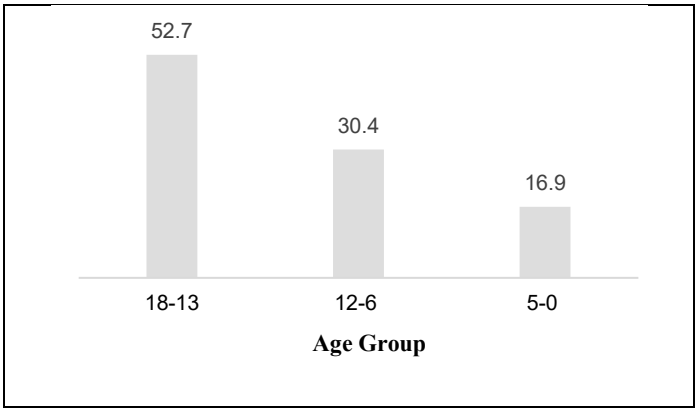

Figure 1: Percentage Distribution of Infected children (18 years or less) with COVID-19 in Palestine by Age group, up to 30/03/2021.
Source: PCBS. 2021.

1.3 Justification

The novel coronavirus (COVID-19) pandemic still has a mysterious side. The virus is continuing spreading round the world with high incidence rate, present of different variants, and limited scientific evidence of consequences and many questions scientists and people still have no answers for. Accordingly, individuals have no option except following preventive behaviors to protect themselves from any infection or any further complications including; social distancing, wearing mask and sanitizing hands with emphasize to follow local (PMoH) and international health organizations (like WHO) instructions of lifestyle modifications to delay the spread of the disease (Carico, et al., 2020).

According to the Palestinian MOH in COVID-19 Surveillance System, the number of confirming cases was rising progressively by time as shown in (Figure 2). Most confirmed cases were located in (20-29) age group followed by (30-39) and (10-19) respectively as shown in (Appendix 1). This indicates that school age group and adolescent in particular were at high risk of infection and transmission of it through schools. Moreover, Hebron Governorate had a significant increasing of

confirmed cases, it had 11.3% of total confirmed cases in West Bank and Gaza and 20.9% of the West Bank only. (PMoH, 2020). (See Appendix 2 and Appendix 3:)

This study tried to explore students' preventive health behaviors towards COVID-19 using HBM. The Health Belief Model focus on the individuals' beliefs, values, tendencies, and habits. It has been used widely to understand and predict individual's health behaviors based on two main characteristics: the desire to avoid a health hazard or disease (like COVID-19), and the perceived effectiveness adopting preventative behavior of the disease (Raamkumar, et al., 2020). As there is lack of studies that assess students' knowledge and preventive behaviors, this study would be a good reference for further studies on COVID-19 and preventative health behaviors in relation to HBM to any age group. In addition, it would help to interpret COVID-19 reports that related to this age group and assess in any promotion program about COVID-19.

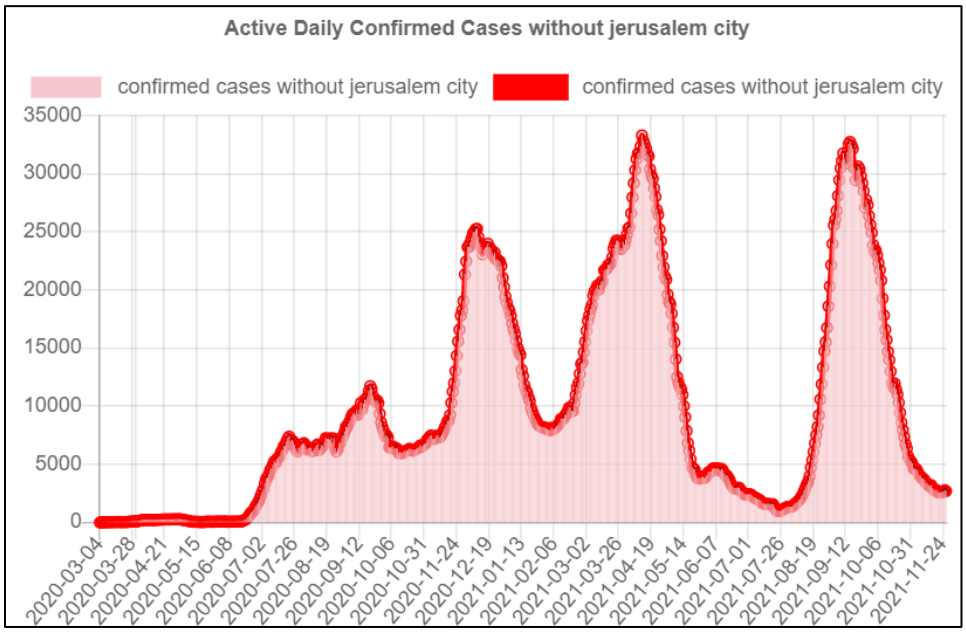

Figure 2: The number of active daily confirmed cases in Palestine between March2020 to Nov.2021.

Source: Palestinian Ministry of Health - COVID19 Surveillance System, 2021

1.4 Purpose of the study

The study aimed to assess the preventive behaviors of seventh to tenth students in North Hebron Directorate of Education schools toward COVID-19 using Health Belief Model. To achieve this, the following measurable general and specific objectives were set:

1.4.1 Objectives

- To assess the knowledge about COVID-19 among seventh to tenth students.
- To assess the practices of behaviors toward COVID-19 among seventh to tenth students.
- To assess the preventive behaviors toward COVID-19 among seventh to tenth students using HBM.
- To assess the relationship between socio-demographic variables and preventive behaviors toward COVID-19 among seventh to tenth students.

1.5 Context

The research conducted in North Hebron Directorate of Education governmental schools. The targeted population were girls and boys students between (13 to 16) years old who enrolled in grades seven to ten.

Due to newly coronavirus, it was important to go deep in the community and study their behavior and beliefs towards the disease and the prevention. Accordingly, the researcher chose Hebron Governorate because it was categorized as one of the most infected areas in the West Bank with the most confirmed cases and deaths due to COVID19 as the Palestinian MOH mentioned in the COVID19 Surveillance System website (see Appendix 2 andAppendix 3:). Furthermore, the age group was carefully chosen according to two factors; the first one was the high number of registered cases of this age group which led to the second reason which was the specialty of this age group as adolescents. As an employee in the School-Health department at Ministry of Education, the researcher realized that (13-16) years old students had the highest confirmed cases in schools, in addition, they were the least committed age group of health recommendations to prevent exposure to COVID-19. There was various explanation of adolescents' behavior and attitude, it could be due to closure and restrictions due to COVID-19, they cannot attend gyms, go

gatherings with friends, travelling, …etc. which increase the interest to understand it toward COVID-19 throughout this study.

North Hebron region includes one city, eight villages and town, and one camp, which are part of Hebron Governorate.

Demographic characteristics of the Palestinian population

According to PCBS (2020), the Palestinians population in Westbank and Gaza Strip at the end of 2020 was estimated at 5.2 million; 3.1 million (59.8%) lived in West Bank and 2.1 million (40.2%) lived in Gaza Strip. The highest population was in Hebron Governorate with 15.0% of the total population, followed by Gaza Governorate, and Jerusalem Governorate (13.6% and 9.0%), and the lowest population was Al - Aghwar Governorate which had the percentage of 1.0% (see Figure 3 and Appendix 4). The Palestinian society considered as a young society, as the percentage of the population aged under 15 years was 38.0%; (36.0%) in the West Bank and (41.2%) in Gaza Strip. On the other hand, there was 3.4% of the population 65 years and above; (3.6%) in the West Bank and (2.8%) in Gaza Strip (see Appendix 5).

In addition, at the end of 2020, the sex ratio was 103.4 males per 100 females; 2.62 million males to 2.54 million females in the West Bank and Gaza Strip. (PCBS, 2020)

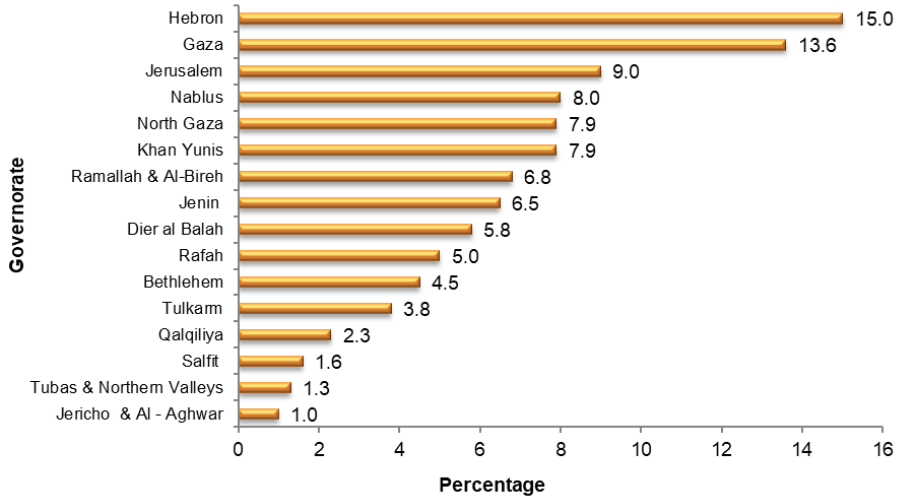

Figure 3:Percentage Distribution of Population in the State of Palestine by Governorate, at the End of 2020

Source: Palestinian Central Bureau of Statistics (PCBS)

On the other hand, in 2020, the population growth rate was 2.5%; 2.2% in the West Bank and 2.9% in Gaza Strip. During the pandemic, the number of deaths due to the COVID-19 among Palestinians reached 1,479 deaths up to the end of 2020. A survey conducted by PCBS about the socio-economic conditions of the Palestinian during the COVID-19 pandemic, indicated that about two thirds (64.5%) of the households' main income earners in Palestine worked during the lockdown. In addition, the data showed that 42.3% of Palestinian household income declined to half and more during the lockdown period compared to February 2020 (PCBS, 2020).

Hebron Governorate

Hebron Governorate is one of eleven Governorates in the West Bank region. It is located in the south of the West Bank, away 36 kilometers from Jerusalem. It is bordered in the north by Bethlehem Governorate and by the Green Line in the other three directions (NCD et al., 2019) (see Figure 4). It is considered as the largest governorate in the West Bank, in terms of area (1,060 square kilometers) and population (772,384) (see Appendix 4) (PCBS, 2020). The Governorate has a total of seven cities, eighteen towns, two refugee camps and more than 100 Bedouin villages (see

Appendix 6). It can be divided into four regions; North Hebron, Middle, South Hebron and Yatta. This division is used most of Hebron Governorate directorates like directorate of education and health. Finally, the Hebron region almost located on mountains, some areas rising 1,032 meters above sea level. The Hebron mountain chain is considered the largest in Palestine (HCCI, 2012).

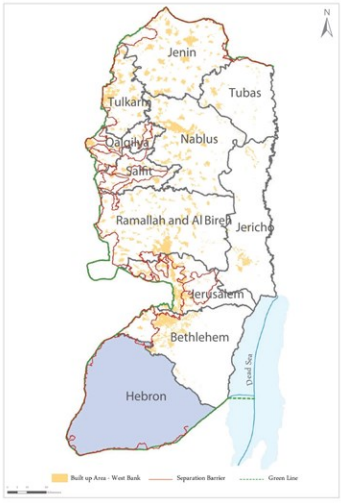

Figure 4:Location of Hebron Governorate
Source: Palestinian Central Bureau of Statistics (PCBS)

North Hebron Directorate of Education

As mentioned before, North Hebron region is a part of Hebron Governorate. It consists of one city; Halhul, 8 towns (Sa'ir, Al-Shuyukh, Bani Na'im, Beit Ula, Nuba, Kharas, Surif and Beit Ummar); and one refugee camp; Al-Aroub Camp (see

Appendix 6). All governmental and private schools in these regions are under authority of North Hebron Directorate of Education. In 2020, it was estimated that there were 39134 students enrolled in 106 governmental schools of North Hebron Directorate of Education from grades preschool to twelve (MOE, 2021). Appendix 7) shows the governmental schools in North Hebron Directorate of Education by their location.

Health services in schools

Ministry of Education and Ministry of Health provide students various health services. First, General Administration of School Health in MOE has two branches; Department of Health Education and Services, and Department of School Environment and Nutrition. Each branch has its own specialty and services. Health services include following-up vaccinations, screening tests, diagnosing diseases and then following-up these cases. Monitoring and following-up school environment and canteen. Health education and promotion; includes health activities, programs, manuals, publications and materials that promote health concepts and life skills that help students to adopt a healthy lifestyle. Second, MOH provides students preventive services, education, emergency care, referral, management of acute and chronic health conditions, and health awareness and promotion. The most two departments of MOH that deal with students are; School Health Department and Health Awareness and Promotion Department. School Health Department provides vaccinations (diphtheria-tetanus-pertussis (DTP) and oral polio vaccine (OPV)), screening tests (visual and dental), full body checkup (for first grade students). The Health Awareness and Promotion Department provides health awareness campaigns of different health-related subjects that promote students' and school community health (MoH, 2020).

1.6 Operational definitions

- Student: a person who is enrolled in seventh to tenth grades in North Hebron governmental schools.
- Knowledge about COVID-19: student's knowledge and understanding of COVID-19 as disease, and its transmission and symptoms and prevention practices.
- Susceptibility: individual's beliefs about the chances that they will be infected by COVID-19.
- Severity: individual's beliefs about the seriousness of the COVID-19.

- Benefits: individual's belief in the benefits of preventing infection of COVID-19.
- Barriers: individual's beliefs in the difficulties of following norms and instructions for preventing infection of COVID-19.
- Self-efficacy: The ability of individual to take safety precautions to COVID-19.
- Cues to action: External influences that promote preventing infection of COVID-19.

1.7 Definition of terms

- Student: a person who is studying at a school, especially a secondary school, or a university or college. (Student, 2022)
- Perceived susceptibility: an individual's beliefs about the likelihood of getting a disease or condition. (Glanz et al., 2008)
- Perceived severity: an individual's beliefs about the seriousness of the effects of contracting the health condition (Orji et al., 2012).
- Perceived benefits: Belief in efficacy of the advised action to reduce risk or seriousness of impact (Glanz et al., 2008)..
- Perceived barriers: An individual's opinion regarding the difficulty or cost of adopting the new behavior. (Orji et al., 2012)
- Perceived self-efficacy: Personal belief on one's own ability to enact the desired behavior. (Orji et al., 2012)
- Cues to action: This consist of both internal and external prompts that will trigger an individual to performing the target behavior. (Orji et al., 2012)

1.8 Study questions

1. What is students' perception of their health status towards the COVID-19?
2. What are the preventive practices of seventh to tenth graders in North Hebron Directorate of Education toward COVID-19?
3. What is students' knowledge about COVID-19 between seventh to tenth graders in North Hebron Directorate of Education?
4. What are the preventive behaviors toward COVID-19 among seventh to tenth students using HBM?

5. What is the relationship between socio-demographic variables and preventive behaviors toward COVID-19 among seventh to tenth students?

Chapter Two:

Literature Review

2.1 Introduction

This chapter provides global, regional, and related studies to the study concepts and variables. That handle the knowledge, source of knowledge, and preventive behaviors of several populations toward COVID-19.

- **International**

An international cross-sectional study conducted by Hsing et al (2020) titled "Influence of Health Beliefs on Adherence to COVID-19 Preventative Practices: International, Social Media–Based Survey Study" aimed to compare hand-washing and social distancing practices in different countries and evaluate practice predictors using the (HBM). The study used an online, cross-sectional survey. Participants were 71,851, aged 18 years or older from United States, Mexico, Hong Kong (China), and Taiwan. The results showed that the United States participants had the most social distancing practices ($\chi 23=2169.7$, P<.001), while respondents from Taiwan performed the most hand-washing ($\chi 23=309.8$, P<.001). Multivariable logistic regression analyses indicated that self-efficacy was a positive predictor for hand-washing, and social distancing practices in all countries. Hand-washing was positively associated with perceived susceptibility in Mexico, Hong Kong, and Taiwan, while social distancing was positively associated with perceived severity in the United States, Mexico, and Taiwan.

In a study conducted in Japan by Hatabu and others (2020), (100%) of respondents showed they had preventive knowledge about COVID-19. About (96.4%) of respondents showed a moderate or higher frequency of washing their hands or wearing masks. In the logistic regressions, gender, major subjects, education level, nationality, residence, and psychological factors were associated with knowledge or attitudes toward COVD-19 ($p < 0.05$). In the logistic and multiple linear regressions, capital regions, high basic knowledge, high information acquisition, correct information explanations correlated positively to preventative action ($p < 0.05$). Non-capital regions, male gender, non-bio-backgrounds, high public self-consciousness, high advanced

knowledge, incorrect information explanations, and high extroversion contributed negatively to self-restraint ($p < 0.05$).

In a cross-sectional study in Italy conducted by Souli and Dilucca (2020) to investigate the knowledge, practice and attitudes (KAP) of secondary school at the time of COVID-19 pandemic (2380) secondary school students; (40.7%) are male and (59.3%) are female. The age of participants ranges from 14 to 19 years old, with a mean age equal to 17 and SD 3.64. Students present a good level of knowledge about signs and symptoms the disease, the basic hygiene principles, the modes of transmission and the preventive measures against virus transmission. Based on our results, the majority of the general population has knowledge about the existence of virus COVID-19. The knowledge about number of this pandemic and easy scientific correlation with COVID-19 is quite confused. The most frequently reported source of knowledge about COVID-19 is television, whereas the less is the school. Instead, we are interested to check which are sources of knowledge about COVID-19, including social media, internet, news media (TV/video, magazines, newspapers), family, friends, school and health-care providers, such as doctors. The most frequently reported source of knowledge is television, followed by Facebook, Whatsapp and Instagram. Unlike the media, school appears to be the last learned option of forgathering knowledge.

Alves et al., (2020) held a cross-sectional observational study titled “Knowledge, attitudes and preventive behaviors toward COVID-19: a study among higher education students in Portugal”. The study tool was an online questionnaire. The participant was 262 higher education students. Students showed a good level of knowledge about COVID-19. There were differences in the level of knowledge according to the gender; females showed a higher level of knowledge compared to male students. Regarding attitudes toward COVID-19, students showed in highly positive attitudes to preventive behaviors, which have been higher among females than males. The perception of risk students was moderate, females showed a higher perception of risk than male. Regarding behaviors females showed more frequently engaged in preventive behavior than males. In addition, Ph.D. students exhibited a lower number of preventive behaviors compared to master's students and bachelor's students. The study showed a positive and statistically significant correlations between the preventive behaviors and knowledge related to COVID-19. Results indicated that the

educational level and the attitudes toward preventive behaviors had a statistically significant effect on the preventive behaviors adopted. Thus, being a bachelor's and having positive attitudes toward preventive behavior of COVID-19 predicted the adoption of those preventive behavior.

An analytical cross-sectional study conducted in Huánuco, Peru. Ruiz-Aquino et al., (2021) cited that there is a statistically significant association between the perception of knowledge and attitudes towards COVID-19, a chi-square value of (7.423), with ($p<0.005$) indicates that the lower perception of knowledge, the better attitude towards COVID-19. Moreover, the analysis of the type of attitudes viewed by citizens towards COVID-19 revealed that 63.1% (106) of respondents had negative attitudes. Statistically significant association was found between the perception of knowledge and the type of attitudes towards COVID-19 ($p<0.005$).

Costa (2020) conducted an article about determinants of coronavirus infection risk using HBM. Exploring four HBM constructs; perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. In addition to pro-health motivation. The researcher used an online questionnaire disseminated by social networks for a one-week period. The study population was 277, aged ≥ 18 years old. Significant differences among groups were more intense in perceived susceptibility and severity dimensions, and less in perceived benefits and barriers.

A web-based cross-sectional study was conducted by Tomar and others (2021) titled “Indian community's knowledge, attitude, and practice toward COVID-19”. The total population was 7978 with age ≥18 years. (54.2%) of the participants were 18–30 years age group, accounting in both the genders, (70.04%) respondents held a graduate degree or above, (40.5%) pursue as a student or unemployed, and (64%) were single. The total knowledge score was 80.64%, attitude 97.33%, and practices 93.8% which considered high level. In multiple linear regression analysis, high knowledge score was significantly associated with male gender ($\beta = 0.036$: $P < 0.001$), urban population ($\beta = 0.006$: $P < 0.002$), higher education ($\beta = 0.029$: $P < 0.001$), and higher occupation ($\beta = 0.002$: $P = 0.05$). In addition, the results showed a positive significant correlation between knowledge and attitude, knowledge and practice, and attitude and practice.

A Cross-Sectional Survey among Public University Students of Bangladesh conducted by Rahman and others (2021). A total of 952 students participated in the study. Female students reported better

knowledge and practice than male students toward COVID-19. Living in the capital city did not demonstrate positive attitudes towards COVID-19 than who living outside the capital. Students who living away from their families showed better attitudes compared to those living their families. The sources of COVID-19 protective measures information were broadcast media, printed media, the internet, university, and social media. Students used print media and university as source of information showed better knowledge and attitude levels compared to those who used surrounding people.

A cross-sectional study was conducted by Rugarabamu et al. (2020) titled "Knowledge, attitudes, and practices (KAP) towards COVID-19: A quick online cross-sectional survey among Tanzanian residents", used online survey. The questionnaire assessed demographic characteristics of participants, Knowledge, attitude, and practice toward COVID. The population reached (400) participants. The mean age 32 years, (54.0%) were females. There were no significant differences in demographic variables ($p>0.3$). Participants with BA degree or above (60.3%) had a higher score. Most of the participants had good knowledge, about (84.4%), which was significantly associated with education level ($p=0.001$). The majority of the respondents (77%) did not go to a crowded place in recent days. Multiple linear regression analysis displayed that lower knowledge score were significantly associated with gender (male), age-group (16-29) years, and education (≤ secondary).

Handebo et al., (2021) conducted an institution-based cross-sectional study to evaluate the knowledge and preventive health behaviors toward COVID-19 and associated factors among secondary school students. The participants were 370 secondary school students from Gondar city, Northwest Ethiopia. The study used bivariable and multivariable ordinal logistic regression model in order to detect the predictors of knowledge about COVID-19. In addition, the study applied simple and multiple linear regression analysis to discover the factors that is related to preventive behavior. And the result showed a statistical significance ($p<0.05$). The outcomes came as following: one-fourth (23.5%, 95% CI 19.5% to 28.1%) of the participants had a good knowledge about COVID-19. The mean score of preventive behavior was 22.8±SD 6.2. Marital status, religion, father education, living arrangement and sources of information were significantly associated with knowledge about COVID-19. Being female and using health professionals as source of

information raised the engagement in preventive behaviors. Alternatively, student whose father employed in non-governmental organization and other jobs had decreased engagement in preventive health behaviors.

- **Regional (Iran, KSA, Egypt, Sudan, Jordan)**

In a population-based survey in Iran (Erfani et al., 2020) titled “knowledge, attitude and practice toward the novel Coronavirus (COVID-19) outbreak”. The majority of the population had a moderate knowledge about COVID-19; 90% score for the knowledge about the characteristics of the disease and 85% for the knowledge about transmission routes and groups at higher risk for the disease. Based on multiple linear regression analysis, knowledge scores were significantly correlation among genders (female), age groups (higher age), marital status (married), occupation (healthcare related professions,), education levels (higher education level), and the number of individuals living together were significantly associated with higher knowledge scores at ($P<0.01$). The study revealed that (82.9%) of participation sample source of information is from social media and internet. Moreover, there was a significant correlation between higher knowledge of the disease and source of information from social media, scientific articles and journals. They also stated that the majority of participants (71.3%) had moderate practice towards COVID-19. Multiple linear regression analysis showed that practices scores significantly varied across gender (male), age groups (higher age), occupations (non-healthcare-related), marital status (single), education levels (lower level of education), living places, and the number of individuals living together were significantly associated with lower practice attitude towards COVID-19 ($P<0.01$).

Hatami et al., 2021 conducted a study titled “Knowledge, attitudes, and safety practices about COVID-19 among high school students in Iran during the first wave of the pandemic”. They mentioned that students' mean (SD) knowledge score was 21.5 (4.6) of 30. More than 90% of students knew about the cause of the disease, the routes of transmission, and the most renowned symptoms. Social-and- audiovisual-media were the leading information source. Students' mean (SD) practice score was 20.2 (2.5) of 24. Most students did not go on a trip, and more than 80% said they would wear facemasks when going outside.

Elgzar et al., (2020) published true-experimental research to study the effect of an educational intervention using the (HBM) on female nursing students' awareness and health beliefs toward COVID-19 in Kingdom of Saudi Arabia. The population was 164 students. It was divided into two groups equally intervention and control group. The results showed no statistically significant differences between intervention and control groups regarding their demographic data, awareness, and health beliefs before intervention. After intervention, significant differences ($p< 0.05$) were found between intervention and control groups in their awareness and all HBM constructs toward COVID19. There were positive, statistically significant correlations ($P< 0.05$) between participants' total HBM score and their total awareness score. The study declared that HBM is effective in increasing nursing students' awareness toward COVID-19. Moreover, it increases their perceived susceptibility, severity, and benefits. Also, it could increase their self-efficacy to overcome perceived barriers to practice protective and preventive actions while dealing with COVID-19.

Barakat & Kasemy (2020) held a cross-sectional study that aimed to evaluate Egyptians' preventive behaviors toward COVID-19 and the correlated role of the HBM. The study was carried out through three stages; at the beginning of COVID-19 pandemic then 4 weeks and10 weeks later. Personal interviews, social networking sites and cell phone calls were used to collect the data. Participants were Egyptians who were 18 years or above. The questionnaire was distributed three times depending on the three previous stages. The number of the participants in these different stages was 380, 210 and 182(starting with first stage and ending with the third one). The number of the participants was falling each stage because of their dropout which left the study with only 182 participants. The results showed that perceived severity and benefits showed significant decrease in the 2nd interview, then a raise in the 3rd interview ($P < 0.001$). Perceived barriers showed a significant increase in the 2nd interview followed by a significant decrease in the 3rd interview ($P < 0.001$). Knowledge result was significantly less at the start, then it increased at the next interview and later it was followed by a decrease in the 3rd interview ($P < 0.001$). Preventive behaviors dropped in the 2nd interview then raised in the 3rd interview ($P < 0.001$). On the analysis of the factors associated with preventive behaviors using multivariate regression, the results determined age, high education, being a health care worker, perceived susceptibility, benefits, barriers and self-efficacy.

Abdelhafiz and others, (2020) conducted a cross-sectional survey to assess the knowledge, perceptions and attitude of the Egyptian public towards the COVID-19. The study population was (559). The, which means that participants had a good knowledge about the disease (mean score was 16.39 out of 23), with positive perception towards protective measures. The main source of knowledge was social media (66.9%), followed by the internet (58.3%). Participants who are older-age, less-educated, lower income, and residents in rural were significantly lower knowledge. In general,

Nasir and others (2020) conducted a cross-sectional study aimed to explore the perceptions of the Sudanese on COVID-19-related preventive measures. The researchers used online-questionnaire based on HBM constructs among 877 Sudanese adults (aged ≥18 years). The results showed that the HBM constructs are correlated to each other as well as to other socio-demographic factors. Self-efficacy correlated negatively with susceptibility (r -0.084) and positively to severity (r 0.117), benefits to (r 0.347) and barriers to hand hygiene (r 0.202), benefits to social distancing (r 0.396) and barriers to social distancing (r 0.276). Moreover, more than half of the participants scored high in almost all HBM constructs, except for benefits of hand hygiene.

Dardas and others (2020) conducted an online cross-sectional study in Jordan about "Developing an understanding of adolescents' knowledge, attitudes, and practices toward COVID-19". The number of the population was 1,054. Their age was between 12 to 18. The results showed that the majority of participants had a good level of knowledge toward COVID-19 with positive attitudes toward protective measures. The majority reported practicing effective health protective behaviors to prevent the spread of COVID-19, which was significantly predicted by their knowledge and attitudes toward these measures. With relatively small but significant percentage of the participants had low level of knowledge on COVID-19, with negative attitudes toward protective measures. Also, they engaged in high-risk practices associated with spreading the virus.

- **Local (Palestine)**

Qutob and Awartani (2020) conducted a cross-sectional study titled "Knowledge, attitudes and practices (KAP) towards COVID-19 among Palestinians during the COVID-19 outbreak". The participants were 1,731 Palestinians (36.5%) from Gaza Strip and (63.5%) from the West Bank.

The gender percentage were (51%) males to (49%) females. The results showed that 79% of the respondents had good awareness COVID-19 transmission, (55.6%) had knowledge of the symptoms, (81%) were aware of the preventative measures and (82%) demonstrated awareness of the risk groups. Most participants complied with preventative measures (77%) and 62% the study participants agreed that stricter measures have to be enforced by the government to limit the spread of the virus. In addition, the study revealed that younger participants and people with higher educational level showed higher awareness about COVID-19. Also, females had higher awareness of preventative measures and good practices. Furthermore, West Bank residence followed the right practices better than Gaza.

Chapter Three:

Methodology

3.1 Introduction

This chapter included a detailed description of the study's methodology and procedures that the researcher followed while implementing the study in terms of the introduction, the study method, the study population and sample description, the preparation of the study tool "the questionnaire", the procedures for verifying the validity and stability of the study tool, and the statistical analysis of the sample characteristics "Statistical Treatment Processing" for the study. Below is a description of these procedures.

3.2 Study setting and population characteristics

This study conducted in North Hebron Directorate of Education schools in the second semester of the school year 2020/2021. The students are distributed in Halhul, Sa'ir, Al-Shuyukh, Bani Na'im, Beit Ula, Nuba, Kharas, Surif, Beit Ummar and Al-Aroub Camp, appendix 8 reviewed some details about these regions. Appendix 9 showed the distribution of the students in schools according to their schools' region, grades and gender. This data was collected from Department of Planning and Statistics in North Hebron Directorate of Education. The table shows that the total population of the targeted grades is 13051 students enrolled in 106 governmental schools; 6910 males (53%) in 42 schools, and 6141 females (47%) in 42 schools.

3.3 Study design

A cross-sectional study was conducted to assess the seventh to tenth students' knowledge and attitude and preventive behavior toward COVID-19 in male and female schools in North Hebron Directorate of Education.

3.4 Sampling process

The sampling was done in two stages to represent all students from targeted population. The first stage was selecting targeted schools randomly. List of schools was obtained from North Hebron Directorate of Education. There were 106 male and female schools in North Hebron region, the

researcher excluded the schools that did not include the targeted grades. The total number of schools that have the targeted grades were 76. The schools were divided with consideration to gender and region. The second stage, classes in the selected schools were selected randomly. The researcher chose convenience sampling as the study tool was an online survey. All students enrolled in North Hebron Directorate of Education from grads seventh to tenth were able to participate in the study. The online survey was opened to students in the 3rd of May 2021 and closed in 17th June 2021.

The researcher contacted with North Hebron directorate of Education to have the needed data about the targeted population. The department of Planning and Statistics provided an excel sheet of the total number of seventh to tenth grades students and the governmental schools they were enrolled in. The researcher modified the excel sheet and prepared it to calculate the sample from each stratum in regard to gender, region and school as shown in the (Appendix 9 and 10). Unfortunately, due to COVID-19 situation and schools' closure, the researcher could not reach schools and students, so the sampling method changed from stratified random sampling to convenience sampling.

3.5 Sample size calculation

The selection of the study population was carefully considered to control variables. The study population consists of all students who are upper primary students (seventh to tenth graders) enrolled in North Hebron Directorate of Education governmental schools, in the second semester of the school year 2020-2021. The schools are distributed over one city, eight towns and one camp. (Table 3. 1) shows the distribution of the study population according to the schools' region and gender. The total study population is (13051) male and female students; 7017 are males, and 5652 are female students, and 382 are male and female students in mixed schools. The details are shown in Appendix 9 and 10.

The sample size calculated using Richard Geiger equation, which result (373) male and female students with (95%) confidence interval (CI), the statistical significance (p value) considered when level ($\alpha \leqslant 0.05$). The study tool (questionnaire) was distributed to students (the sample) online, the number of the participants were (331), with a response rate about (88.7%). The 20 sample of the piloting study were excluded.

Thus, the study sample which the data have been analyzed, has reached (331) male and female students studying in the seventh to tenth grades in the North Hebron Directorate of Education schools.

Table 3. 1: Distribution of study population according to the region and gender.

Region	Male	Female	Mixed	Total
Halhul	1261	951	58	2270
Al-Shuyukh	518	519	170	1207
Sier	1099	1211	30	2340
Al-Aroub	113	129	0	242
Bani Na'im	982	1119	70	2171
Beit Ummar	756	823	0	1579
Surif	715	192	26	933
Nuba	536	97	28	661
Kharas	386	436	0	822
Beit Ula	651	175	0	826
Total	**7017**	**5652**	**382**	**13051**

3.6 Inclusion-exclusion Criteria:

The schools that included in the study were 76 schools out of 106 from North Hebron Directorate of Education.

Inclusion criteria for selecting schools and participants:

- All governmental schools in North Hebron Directorate of Education.
- All students enrolled in the targeted grades in the selected schools.

Exclusion criteria for selecting schools and samples:

- All schools that are not governmental (private or UNRWA).
- All schools do not belong to North Hebron Directorate of Education.
- All schools that do not have the targeted grades.
- All students in the selected schools but are not enrolled in the targeted grades.
- All students who are not enrolled in the selected schools and the targeted grades.

3.7 Data collection procedure

Data collection took place in the period between the 3rd of May, 2021 to the 17th of June, 2021. The Center for Educational Research & Development (CERD) at Ministry of Education approved the data collection request (Research Facilitation Letter) at the beginning of May 2021 (see Appendix 11), they were late to give the approval due to COVID-19 situation and the number of working days reduction in all government institutions specially, the research center at the Ministry of Education.

After receiving the Ethical approval and Research Facilitation Letter, the researcher instantly started to connect with the Research, Development and Quality coordinator at the N. Hebron Directorate of Education to ease the communication with school principals and to distribute the online survey. The principals distributed the online survey link through the schools' Facebook pages and MS Teams groups. The response rate was low, so the researcher recontacted with the RDQ coordinator in North Hebron Directorate and she resent the link to the school principals several times. In addition, the researcher contacted directly with the school principals and teachers as many as she could reach to encourage the students to fill the online form of the online survey, which thankfully, increased the response rate to (88.7%).

3.6 Study Instrument

In order to study seventh to tenth graders' knowledge, attitudes and preventive behaviors towards COVID-19 according to HBM constructs in the North Hebron region, the researcher used an electronic self-administered questionnaire as a tool for collecting data and information. The study tool was developed after referring to previous studies that are similar to the study topic and purpose. Thus, most of the questions were adopted, prepared and validated previously like the "Study of the Sudanese perceptions of COVID-19: Applying the Health Belief Model" by Nasir and others (2020), "Preventive health behaviors during coronavirus disease 2019 pandemic based on health belief model among Egyptians" by Barakat and Kasemy (2020). Moreover, the tool was developed under supervision of the supervisor doctor and a group of experts and specialists (see Appendix 12).

The study tool consisted of two parts; **The first part** consisted of socio-demographic data which represented a set of indicators for the respondents (gender, age, grade, place of residence, parents'

education level, parents' work in healthcare professions, the student's birth-order in the family, the number of siblings (brothers and sisters), the number of people who lives in the house, the number of rooms in the house) to determine the characteristics of the study participants. Also, the first part included eight close ended questions to assess the student's health status, and another nine close ended questions that measured variables like knowledge and practices of participants (students) toward the Coronavirus.

The first part consisted of (27) questions distributed under three headings, as the following;

1. Socio-demographic data (age, sex, grade, …). Q (1.1-1.10).
2. Perception of health status assessment. Q (1.11-1.18).
3. Practices and knowledge variables. Q (1.19-1.27).

The second part of the questionnaire consisted of (45) items that measured students' preventive behaviors toward COVID-19 like wearing masks, hand hygiene and social distancing which are the most important preventive behaviors (CDC, 2021) depending on HBM constructs. Items were derived from Nasir et al. (2020). The model was divided into nine headings (constructs). The answers were a five-point scale according to Likert Scale with five degrees (Strongly Agree, Agree, Neutral, Disagree, Strongly Disagree), and the items were titled by headings as:

1. Perceived of self-efficacy; consisted of six items which measured individual's beliefs about their capabilities to have preventive behaviors of COVID-19. Q (2.1-2.6).
2. Perceived of susceptibility; consisted of three items that assessed individual's beliefs about the possibility of getting infection with COVID-19. Q (2.7-2.9).
3. Perceived severity; consisted of six items that measured individual's beliefs about the seriousness of the situation (COVID-19) and its possible consequences. Q (2.10-2.15).
4. Benefits of hand hygiene; consisted of four items, which measured the individual's potential positive benefits of adopting personal hygiene behavior. Q (2.16-2.19).
5. Barriers for hand hygiene; consisted of eight items, measured person's thoughts of the obstacles to adopt preventive health action (personal hygiene). Q (2.20-2.27).
6. Benefits of social distancing; consisted of two items that assessed individual's potential positive benefits of social distancing to prevent the spread of Coronavirus. Q (2.28-2.29).
7. Barriers of social distancing; consisted of five items which measured individual's thoughts of obstacles that prevent adopting social distancing behavior. Q (2.30-2.34).

8. Cues to action: consisted of six items, they measured factors that prompt action the recommended preventive behavior. Q (2.35-2.40).
9. Actual actions; consisted of five items, they measured individual's ability to adopt preventive behaviors. Q (2.41-2.45).

All the questionnaire items were prepared in English and then depending on the experts' comments the items were modified and translated into Arabic to meet students' level. (See Appendix 14).

3.7 Validity of study tool

The validity of the questionnaire refers to the degree to which an instrument actually measures what it intends to measure among the intended respondents. The questionnaire was verified through three phases:

3.7.1 Content validity (experts judge)

To measure validity and reliability of the study tool the researcher asked group of evaluators who are experts and specialists in health promotion, public health, research and statistics in Al-Quds University, School-Health department at North Hebron Directorate of Education and others (see Appendix 13)**Error! Reference source not found.**They shared their opinions and comments about content validity, whether the items in the instrument appear to be relevant, reasonable, unambiguous and clear. Their feedback and comments were discussed with the supervisor and considered in formatting and formulating the last draft of the questionnaire. The experts received two versions of the questionnaire (English and Arabic), most of them send their feedback on the Arabic one to ease tool modification.

3.7.2 Piloting sample

After the tool has developed, the researcher did a pilot study included five students from each targeted grade (7,8,9,10). They were randomly selected from two schools (male and female), making 20 questionnaires as a pilot to measure the instrument validity. The researcher met students online using MS Teams App, as the schools were closed due to COVID-19, she sent them the online questionnaire to start filling it, the questionnaire took approximately 10-15 minutes to be completed. After the group answered the questionnaire, each item was discussed. Then the

researcher asked students give their feedback, if they had any difficulty with understanding and answering any item or would like to provide any recommendation to improve construct validity. The piloted participants were excluded from the total sample because of the modifications that have been done in some questions like simplifying some expressions and adding more choices to suit the recommendations.

3.7.3 The internal consistency of the questionnaire items

The researcher verified the validity of the second part of the tool by calculating the Pearson correlation coefficient for the items of the scale with the total score for each of the health beliefs model constructs, as shown in (Table 3. 2).

Table 3. 2: Results of Pearson correlation coefficient for of the HBM construct.

No.	(r) value	Statistical significance	No.	(r) value	Statistical significance
1.	0.634	0.000	24.	0.769	0.000
2.	0.663	0.000	25.	0.706	0.000
3.	0.602	0.000	26.	0.684	0.000
4.	0.666	0.000	27.	0.508	0.000
5.	0.704	0.000	28.	0.854	0.000
6.	0.688	0.000	29.	0.906	0.000
7.	0.689	0.000	30.	0.702	0.000
8.	0.688	0.000	31.	0.765	0.000
9.	0.581	0.000	32.	0.635	0.000
10.	0.700	0.000	33.	0.800	0.000
11.	0.727	0.000	34.	0.769	0.000
12.	0.723	0.000	35.	0.546	0.000
13.	0.637	0.000	36.	0.706	0.000
14.	0.195	0.000	37.	0.680	0.000
15.	0.590	0.000	38.	0.756	0.000

No.	(r) value	Statistical significance	No.	(r) value	Statistical significance
16.	0.832	0.000	39.	0.785	0.000
17.	0.808	0.000	40.	0.680	0.000
18.	0.833	0.000	41.	0.783	0.000
19.	0.624	0.000	42.	0.822	0.000
20.	0.514	0.000	43.	0.764	0.000
21.	0.682	0.000	44.	0.767	0.000
22.	0.732	0.000	45.	0.564	0.000
23.	0.655	0.000			

** Statistically significant at level α 0.01 * Statistically significant at level α 0.05

The data in the (Table 3. 2) indicated that all items with HBM constructs were statistically significant, which indicated the strength of internal consistency of the tool.

3.8 Reliability of study tool

The researcher verified the reliability of the study tool through the method of internal consistency by calculating the stability coefficient Cronbach Alpha (α), where the method of Cronbach Alpha depends on calculating the variances of the items. The value of the reliability of the study tool reached at the total degree of all sections (nine sections) was (86.8%), which confirmed that the study tool (the questionnaire) had a high degree of stability and reliability.

3.9 Statistical analysis

After collecting the data and ensuring validity for analysis, the researcher reviewed it in preparation for conducting statistical data processing, for example; each questionnaire labeled with certain number, data editing and modification (like expressing number of siblings in letters or in separated numbers instead of total numbers), and converting the verbal answers to numerical, as in the second part of the questionnaire the answers was given the strongly agree (5 points), agree (4 points), and neutral (3 points), disagree (2 points), and strongly disagree (1 points) in the positive paragraphs and it was reversed in the negative paragraphs in items (9, 14, 20-27, 30-34). The total score indicates

the students' level of knowledge and preventive behaviors towards the COVID-19 as the higher score means the higher level they obtain.

Statistical processing of the data was carried out by extracting numbers, percentages, means, standard deviations ± SD, Pearson correlation, and Cronbach's alpha (α) equation. The effects of different factors were separately investigated using the univariate analyses. The effective factors were examined by the multiple regression analysis at a significant level of 0.05 through SPSS statistical program version 23.0.

SPSS 16.

3.10 Statistical Methods

The researcher relied on the Likert Scale to interpret the results. To analyze the Likert Scale (five-point scale), each agreement level had a value out of five (1-5) according to the attitude positivity of each sentence. Thus, the difference of the highest value from the lowest value (the range) was calculated. The value of the range was divided by the number of options required to judge the results, which is (5). Then, the results have the value of (4 ÷ 5 = 0.80), therefore we continue to increase this value starting from the lowest value in order to give the intervals for determining the state or direction depending on the mean. The answers in the questionnaire in all levels (four, three and two points) were analyzed the same, as shown in (Table 3. 3).

Table 3. 3: Scoring key for the questionnaire items.

	5-point Likert scale	**4-point Likert scale**	**3-point (Always/ Sometimes/ Never)**	**2-point (Yes/No)**	**Score**
Mean	1.00 – 1.80	1 – 1.74			Very low
	1.81 – 2.60	1.75 – 2.49	1.00 – 1.66	1.00 – 1.33	Low
	2.61 – 3.40		1.67 – 2.33	1.34 – 1.67	Moderate
	3.41 – 4.20	2.50 – 3.24	2.34 – 3.00	1.68 – 2.00	High
	4.21 – 5.00	3.25 – 4			Very high

For univariate and multivariate analysis, the HBM 45 Items with a 5-point Likert scale. The scale was treated as an ordinal data with the following given response at each point; “Strongly disagree”, “disagree”, “neutral”, “agree” and “strongly agree”. Points were given for each category as follows; 1- Strongly disagree; 2 - Disagree; 3 - Neutral; 4 - Agree; 5 - Strongly agree. For each domain, the total score was a summation of the points obtained for all the items in the domain. This was re-categorized as strong belief, poor belief and neutral (neither strong nor poor) belief using a threshold which was calculated by multiplying 3 (points for answering neutral) with the number of items in each heading (see Table 3.4). This scoring system was adopted from Yusof et al. (2014) study about “Awareness and Prevalence of Mammography Screening and its Predictors” that used HBM. The univariate regression was done according to the age category (< 14 years old) and (> 14 years old),

Table 3. 4: Health Belief Scale Scoring System

Perceived of self-efficacy (6 items)	
Strong belief	if cumulative total score more than 18 (>18)
Neutral/ No belief	if cumulative total score equal to 18 (=18)
Poor belief	if cumulative total score less than 18 (<18)
Perceived of susceptibility (3 items)	
Strong belief	if cumulative total score more than 9 (>9)
Neutral/ No belief	if cumulative total score equal to 9 (=9)
Poor belief	if cumulative total score less than 9 (<9)
Perceived severity (6 items)	
Strong belief	if cumulative total score more than 18 (>18)
Neutral/ No belief	if cumulative total score equal to 18 (=18)
Poor belief	if cumulative total score less than 18 (<18)
Benefits of hand hygiene (4 items)	
Strong belief	if cumulative total score more than 12 (>12)
Neutral/ No belief	if cumulative total score equal to 12 (=12)
Poor belief	if cumulative total score less than 12 (<12)
Barriers for hand hygiene (8 items)	
Strong belief	if cumulative total score more than 24 (>24)
Neutral/ No belief	if cumulative total score equal to 24 (=24)
Poor belief	if cumulative total score less than 24 (<24)
Benefits of social distancing (2 items)	
Strong belief	if cumulative total score more than 6 (>6)
Neutral/ No belief	if cumulative total score equal to 6 (=6)
Poor belief	if cumulative total score less than 6 (<6)
Barriers of social distancing (5 items)	
Strong belief	if cumulative total score more than 15 (>15)

Neutral/ No belief	if cumulative total score equal to 15 (=15)
Poor belief	if cumulative total score less than 15 (<15)
Cues to action (6 items)	
Strong belief	if cumulative total score more than 18 (>18)
Neutral/ No belief	if cumulative total score equal to 18 (=18)
Poor belief	if cumulative total score less than 18 (<18)
Actual actions (5 items)	
Strong belief	if cumulative total score more than 15 (>15)
Neutral/ No belief	if cumulative total score equal to 15 (=15)
Poor belief	if cumulative total score less than 15 (<15)

3.11 Ethical consideration

The research committee at the Faculty of Public Health at Al Quds University evaluated the proposal of this study considering the ethical issues associated with conducting this research. Ethical approval obtained from Al Quds University Ethical Research committee (REC) (see Appendix 12).

The permission to conduct the study and "facilitate the task of researcher" was obtained from the CERD at MOE (see Appendix 11) who contacted the North Hebron Directorate of Education in order to inform the targeted schools' principals to facilitate the researcher task. It was supposed to ask each participant to sign the consent form from their parents with clarification of study aim and objectives (see Appendix 15) but due to the closure of school because of COVID-19 situation, the researcher added to the first section of the online questionnaire an option for parents' acceptance in the first section (see Appendix 16). If the answer was (Yes) the form goes to the next section (the questionnaire), while if the answer was (No) the form goes directly to the end (submit form). Finally, it is important to mention that the ethical considerations were taken in account through data collection and gathering.

3.12 Conceptual framework

Numerous theories and models have been developed to explain and understand individual's attitudes and behaviors related to health. The HBM consider as one of the most widely applied theories of health-related behavior. The study conceptual framework was derived from Health Belief Model (adapted from Rosenstock, 1974) with some modifications as Glanz et al mentioned in their book "Health Behavior and Health Education" (2008, p.49) (see Figure 5).

The model contains several primary constructs like; susceptibility, seriousness, benefits and barriers to a behavior, cues to action, and most recently, self-efficacy. The HBM perceptions about whether individuals will take action to prevent or to control ill-health if they; regard themselves as susceptible to the condition (perceived susceptibility), and if they believe that the condition would have potentially serious consequences for them (perceived severity), also, if they believe that the course of action available to them reduce the susceptibility or severity, or lead to other positive outcomes (perceived benefits), in addition, if they believe that the anticipated barriers (or costs) of taking action would be outweighed by benefits (perceived barriers) (Jones et al., 2015).

The study described the application of the HBM as shown in (Figure 5) on school students to understand their preventive behaviors toward COVID-19 using HBM. The conceptual framework included all constructs of HBM.

1. Dependent variable: individual beliefs (HBM).
2. Independent variables include; demographics, age, gender, personality, socioeconomics, knowledge, occupation, level of education, …

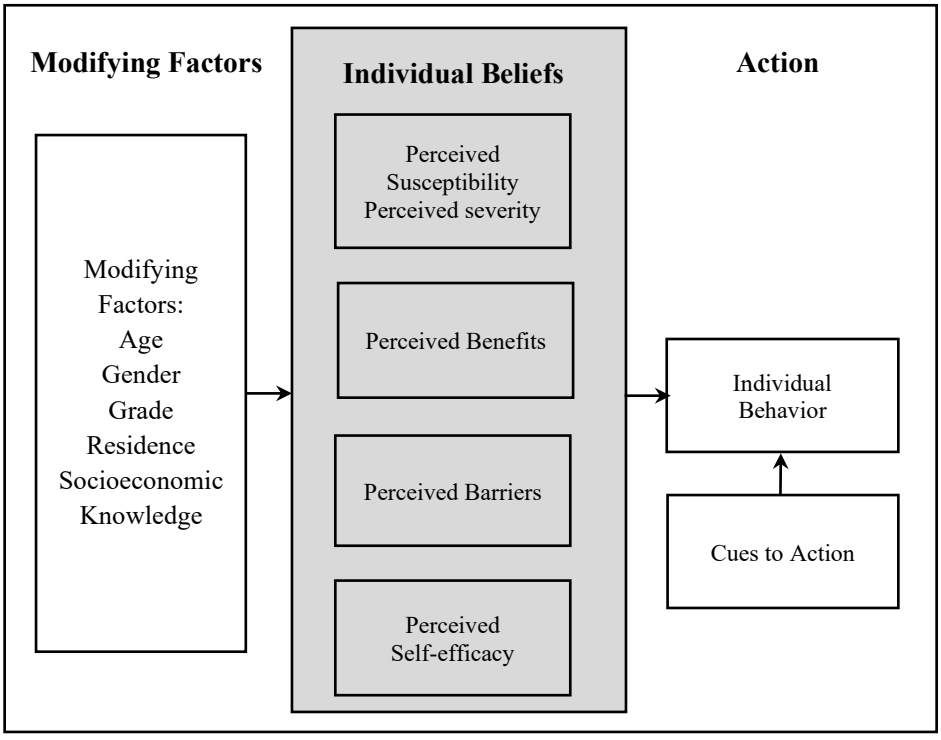

Figure 5: Conceptual framework by Health Belief Model.

3.13 Definition of variables

3.13.1 Main dependent variables:

The main dependent variables were HBM constructs:

- Perceived of self-efficacy; measured individual's beliefs about their capabilities to have healthy behavior (preventive behaviors of COVID-19).
- Perceived of susceptibility; assessed individual's beliefs about the possibility of getting infection with Coronavirus.
- Perceived severity; measured individual's beliefs about the seriousness of the situation (COVID-19) and its possible consequences.
- Benefits of hand hygiene; measured the individual's potential positive benefits of adopting personal hygiene behavior.
- Barriers for hand hygiene; measured person's thoughts of the obstacles to adopt preventive health action (hand hygiene).
- Benefits of social distancing; assessed individual's potential positive benefits of social distancing to prevent the spread of Coronavirus.
- Barriers of social distancing; measured individual's thoughts of obstacles that prevent adopting social distancing behavior.
- Cues to action: measured factors that prompt action the recommended health behavior.
- Actual actions: measured individual's ability to adopt preventive behaviors.

3.13.2 Independent Variables

- Demographics: (age, sex, grade, residence, parents' level of education, …).
- Socioeconomic level: (birth order, no. of family members, no. of rooms in the house).
- Structural variables: knowledge about COVID-19 symptoms and preventive behaviors.

Chapter Four:

The Results

4.1 Introduction

This chapter includes a complete and detailed presentation of the most important findings of the study, about knowledge, attitudes, and preventive behaviors towards the COVID-19 among seventh to tenth graders: a cross-sectional study in North Hebron Directorate of Education, by answering the study questions, and verifying the validity of the hypotheses using appropriate statistical techniques.

4.2 Descriptive analysis

The table (4.1) showed that (36.9%) of the sample were males compared to (63.1%) were females. (62.8%%) of the students were 14 years old or less, and (37.2%) older than 14 years old. The results showed that (17.8%) of the students were in the seventh grade, (36.3%) of them were in the eighth grade, (19.3%) in the ninth grade, and (26.6%) were in the grade ten.

The results declared that (26.5%) of students lived in cities, (50.2%) of them lived in towns, and (23.3%) of the students lived in Al-Aroub Camp.

In parents' level of education, (60.1%) of the fathers and (47.7%) of the mothers had high school or less, (34.4%) of the students' fathers and (44.7%) of students' mothers had intermediate diploma or bachelor's degree, while (5.4%) of students' fathers and (7.6%) of students' mothers had a higher education level.

The table also pointed out that the percentage of students who had a parent worked in healthcare professions were, and (5.7%) of students had both parents were working in healthcare professions, while (78.6%) of students were none of their parents worked in healthcare professions.

Participants' birth order showed that, (25.7%) of the students were the first-born in their family, (17.5%) of them were the second, (16.9%) were the third, (13.0%) were the fourth, and (26.9%) were students whose order in the family other than that.

The percentage of students that had three or less siblings (brothers and sisters) was (25.4%), (21.5%) of them had four siblings, (22.6%) had five siblings, and (30.5%) of the students had six brothers and sisters or more.

Finally, the household crowding index (HCI) the results showed that (23.3%) of the students had HCI less than one, while more than half of students (59.1%) had HCI one to two, and about (17.6%) of students had more than two HCI. (Appendix 14 present some results in details).

Table 4. 1: Socio-demographic characteristics

Variable		Count (Frequency)	Percentage (%)
Gender	Male	122	36.9%
	Female	209	63.1%
Age	≤ 14 years	208	62.8%
	> 14 years	123	37.2%
Grade	Seventh	59	17.8%
	Eighth	120	36.3%
	Nineth	64	19.3%
	Tenth	88	26.6%
Residence	City	88	26.5%
	Village/ Town	166	50.2%
	Camp	77	23.3%
Father's level of education	High school or less	199	60.1%
	Diploma & BA	114	34.4%
	Higher Education	18	5.4%
Mother's level of education	High school or less	158	47.7%
	Diploma & BA	148	44.7%
	Higher Education	25	7.6%
Parents work in healthcare professions	One parent	52	15.7%
	Both parents	19	5.7%
	None	260	78.6%
Birth order	First	85	25.7%

Variable		Count (Frequency)	Percentage (%)
	Second	58	17.5%
	Third	56	16.9%
	Fourth	43	13.0%
	Other	89	26.9%
Number of siblings	≤ 3	84	25.4%
	4	71	21.5%
	5	75	22.6%
	≥ 6	101	30.5%
Household crowding	< 1	77	23.3%
index	1 – 2	195	59.1%
	> 2	58	17.6%

4.3 Study questions answers

4.3.1. Answering the first question: What is students' perception of their health status towards the COVID-19?

The data presented in (Table 4.2) indicated that most of the students believe that they have good to very good health status. Which was showed in the total score (very high), as the mean and standard deviation were (4.67±0.66). The table also showed that more than 80% of students did not receive any medical consultation the past month. The score was low as the mean and standard deviation were (1.17±0.37).

Most of the students did not have any respiratory symptoms in the last 14 days, the score was low, as the mean and standard deviation were (1.04±0.47). Also, most of students (about 95%) have not traveled outside Palestine during the past month. The total score was low as the mean and standard deviation were (1.05±0.23). Moreover, the table presented that 21% of students have done the PCR testing of COVID-19, 67% of them resulted positive. Additionally, about 70% of students answered that they knew people experienced infection the total score was high, as the mean and standard deviation were (1.69±0.46).

The results also showed that about 4% of the participants had chronic diseases which had score low, as the mean and standard deviation were (0.98±0.32). (Details for each grade are mentioned in Appendix 17)

Table 4. 2: Total frequencies and percentages of students' perception of their health status towards COVID-19.

Question	Freq.	Answer				Mean	SD
	%	Very good	Good	Accept -able	Very bad		
How do you assess your current health status?	F	248	63	17	3	4.67	0.659
	%	74.9	19.0	5.1	0.9		
		Yes		**No**			
Have you got any medical consultation in the past month?	F	55		276		1.17	0.373
	%	16.6		83.4			
		Yes	**No**	**I don't remember**			
Did you have any respiratory symptoms (cough, shortness of breath, runny nose) in the last 14 days?	F	44	257	30		1.04	0.472
	%	13.3	77.6	9.1			
		Yes		**No**			
Have you traveled outside Palestine during the past month?	F	18		313		1.05	0.227
	%	5.4		94.6			
		Yes		**No**			
Have you done a PCR test for COVID-19 before?	F	69		262		1.21	0.407
	%	20.8		79.2			
		Negative		**Positive**			
What was the result? * 249 missing values	F	27		55		1.67	0.473
	%	32.9		67.1			
		Yes		**No**			
Do you know people infected with COVID-19 (family member, friend, …)?	F	230		101		1.69	0.461
	%	69.5		30.5			
		Yes	**No**	**I can't decide**			
Do you have any chronic disease?	F	14	298	19		0.98	0.316
	%	4.2	90.0	5.7			

N= 331

4.3.3 The answer of the second question: What are the preventive practices of seventh to tenth graders in North Hebron Directorate of Education toward COVID-19?

The table (4.4) showed that most of students wear the mask before leaving home (between always to sometimes. The total score of all grades was low as the mean and standard deviation were (2.15±0.56). Also, about (97%) of students washing their hands immediately after entering home and before touching anything. The total score was high as the mean and standard deviation were (2.53±0.56). Most of students' daily life effected by COVID-19 while about (17%) did not change at all. The total score was high as the mean and standard deviation were (2.26±1.03).

Moreover, the data indicated that more than half of students had changed their plans due to COVID-19 while about (45%) had not. The total score was moderate as the mean and standard deviation were (1.55±0.98). Details for each grade are shown in (Appendix 19)

Table 4. 3: Frequencies and percentages of students' preventive practices towards COVID-19.

Question	Freq.	Answer				Mean	SD
	%	Always	Sometimes	Never			
Do you wear a mask before leaving home?	F	79	222	30		2.15	0.555
	%	23.9	67.1	9.1			
Do you wash your hands with soap immediately after entering home and before touching anything?	F	187	134	10		2.53	0.557
	%	56.5	40.5	3.0			
		A lot	Some	A little	Not at all		
How much does the Coronavirus changed your daily routine?	F	87	126	62	56	2.26	1.030
	%	26.3	38.1	18.7	16.9		
		Yes		No			
Changing any plans that you have made due to the Coronavirus?	F	183		148		1.55	0.498
	%	55.3		44.7			

N=331

4.3.4 The answer of the third question: What is students' knowledge about COVID-19 between seventh to tenth graders in North Hebron Directorate of Education?

This question was answered in three tables as the following:

First, table (4.5) showed that students had a very good knowledge about COVID-19 as (79%) answered correctly on knowledge questions. The best answered question correctly was "Those who are elderly and have chronic diseases are more likely to develop severe cases" with percentage of (91%). The least one was "Stuffy nose, runny nose, and sneezing are less common in persons infected with COVID-19" with percentage of (57%).

The total score of knowledge was high as the mean and standard deviation were (1.70±0.16). Appendix (20) shows more details about students answers according to grade in each question.

Table 4. 4: Frequencies and percentages of students' knowledge towards COVID-19.

Question	Freq. %	Answer True	Answer False	Mean	SD
The main clinical symptoms of COVID-19 are fever, fatigue, and dry cough. (True)	F	295	36	1.89	0.312
	%	89.1	10.9		
COVID-19 transmitted mainly through droplets and nose drops from an infected person with the virus. (True)	F	270	61	1.82	0.388
	%	81.6	18.4		
Stuffy nose, runny nose, and sneezing are less common in persons infected with COVID-19. (True)	F	189	142	1.57	0.496
	%	57.1	42.9		
Not all persons infected with COVID-19 will develop severe complications. (True)	F	224	107	1.68	0.468
	%	67.7	32.3		
Those who are elderly and have chronic diseases are more likely to be severe cases. (True)	F	302	29	1.91	0.283
	%	91.2	8.8		
Shaking hands and touching stuff of an infected person may lead to infection with COVID-19. (True)	F	287	44	1.87	0.340
	%	86.7	13.3		
Persons infected with COVID-19 cannot transmit the virus to others if fever does not present. (False)	F	62	269	1.19	0.391
	%	18.7	81.3		

Second, table (4.6) showed the students' knowledge about the most important preventive measures of COVID-19. The results showed that the most common preventive behaviors between students

were “Wearing mask, no shaking hands or kissing others, washing hands regularly with soap and water for at least 20 s.” with percentage (79.70%, 77.30%, and 73.00%) respectively.

The least measure indicated to prevent COVID-19 was “not drinking water” with percentage of (3.3%). Which indicates that students are aware of the necessity of drinking water in preventing flue like diseases.

Table 4. 5: Frequencies and percentages of preventive measures toward COVID-19.

measures	Frequency	Percentage %
No shaking hands or kissing others.	256	77.3%
Not drinking water.	11	3.3%
Social distancing of at least 1 m.	219	66.2%
Washing hands with soap immediately after entering home and before touching anything.	227	68.5%
Eating fast food.	19	5.7%
Not touching eyes, nose and mouth by hands.	212	64.0%
Drinking Soda drinks.	18	5.4%
Washing hands regularly with soap and water for at least 20s.	242	73.0%
Going to parties and gatherings.	32	9.7%
Wearing Mask.	264	79.7%

N= 331

Third, the table (4.7) showed the most common sources of information about the COVID-19 and preventive measures among seventh to tenth students in North Hebron Directorate of Education. The data indicated that the Palestinian Ministry of Health was the most common source of information with a percentage of (65.9%). Followed by schools and teachers, and social media with a percentage of (42.6%, and 42.3%) respectively. While the least common sources of information about the COVID-19 among students was radio (5.1%).

Table 4. 6: Frequencies and percentages of sources of information about COVID-19 and prevention

Source of information	Frequency	Percentage %
Palestinian Ministry of Health	218	65.9%
School/teachers	141	42.6%
Social media	140	42.3%
Internet	133	40.2%
Parents	129	39.0%
Doctors	111	33.5%
WHO publications	95	28.7%
TV	61	18.4%
Friends	48	14.5%
Nurses	29	8.8%
Other	19	5.7%
Radio	17	5.1%

N= 331

4.3.5 Answering the fourth question: What are the preventive behaviors toward COVID-19 among seventh to tenth students using HBM?

To answer this question, each of HBM constructs was discussed separately and then total score of all constructs was mentioned at the end.

First: Perceived Self-efficacy:

The data in table (4.8) showed that perceived self-efficacy among seventh to tenth students in North Hebron Directorate of Education schools shows a very high score, as the mean and standard deviation were (4.38±0.49). The highest score of perceived self-efficacy among students was "Maintaining good health is an important part of my life", with a mean and standard deviation (4.81±0.53), and the least was students' belief of taking the correct health measures, as it had a high score with a mean and standard deviation (4.03±0.83).

Table 4. 7: Frequency distribution of answers to questions based on perceived self-efficacy

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
1	**1**	Maintaining good health is an important part of my life.	*f*	282	40	6	1	2	4.81	0.531	Very high
			%	85.2	12.1	1.8	0.3	0.6			
2	**3**	I think it is important for me to have good general health.	*f*	221	89	15	6	-	4.59	0.666	Very high
			%	66.8	26.9	4.5	1.8	-			
3	**4**	I think it is important for me to avoid infectious diseases.	*f*	225	81	15	6	4	4.56	0.770	Very high
			%	68.0	24.5	4.5	1.8	1.2			
4	**2**	I think I am a person who cares well for his general.	*f*	117	162	45	4	3	4.17	0.770	High
			%	35.3	48.9	13.6	1.2	0.9			
5	**6**	I have ability to follow every preventive instruction against the disease.	*f*	126	138	56	5	6	4.13	0.872	High
			%	38.1	41.7	16.9	1.5	1.8			
6	**5**	I think I am a person who takes correct health measures.	*f*	101	152	66	10	2	4.03	0.825	High
			%	30.5	45.9	19.9	3.0	0.6			
		Total score							**4.38**	**0.490**	**Very high**

Second: Perceived susceptibility

Table (4.9) indicated that the perceived susceptibility to infection among seventh to tenth students in North Hebron Directorate of Education schools, had a moderate score in total, as the mean and standard deviation were (3.20±0.85). The highest score was (high) in the students' acquaintances likely of getting infected with COVID-19, with mean and standard deviation of (3.99±1.10). The least score was student's belief if he/she is more vulnerable to get infection with COVID-19, which had a moderate score, with a mean± SD (2.79±1.20).

Table 4. 8: Frequency distribution of answers to questions based on perceived susceptibility

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
1	**7**	One of my acquaintances is likely to develop Coronavirus infection.	*f*	129	125	37	26	14	3.99	1.095	High
			%	39.0	37.8	11.2	7.9	4.2			
2	**8**	I don't care about COVID-19 and do my daily activities like before.	*f*	56	92	81	49	54	2.82	1.727	Moderate
			%	16.6	27.8	24.5	14.8	16.3			
3	**9**	I am more likely to get the disease.	*f*	31	62	100	83	55	2.79	1.199	Moderate
			%	9.4	18.7	30.2	25.1	16.6			
		Total score							**3.20**	**0.845**	**Moderate**

Third: Perceived Severity

The data in table (4.10) indicated that the perceived severity among seventh to tenth students in North Hebron Directorate of Education schools had a (moderate) score, with a mean and standard deviation (3.40±0.78). The highest score of perceived severity to infection was "the disease had high mortality rate" which had a (high) score, with a mean and standard deviation (3.99±1.00). The least score was the students' belief that "the disease is not very dangerous" as it got a (moderate) score with a mean and a standard deviation (2.62±0.78).

Table 4. 9: Frequency distribution of answers to questions based on perceived severity

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
1	**13**	This disease has a high mortality rate.	*f*	121	121	64	16	9	3.99	1.000	High
			%	36.6	36.6	19.3	4.8	2.7			
2	**15**	The disease infectivity is high.	*f*	104	136	59	19	13	3.90	1.034	High
			%	31.4	41.1	17.8	5.7	3.9			
3	**12**		*f*	88	112	71	36	24	3.62	1.194	High

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
		If I get corona infection it will affect my daily life.	%	26.6	33.8	21.5	10.9	7.3			
4	**10**	If I get corona infection, the situation is dangerous.	*f*	84	95	68	59	25	3.47	1.253	High
			%	25.4	28.7	20.5	17.8	7.6			
5	**11**	If I get corona infection, I can lose my life.	*f*	38	47	103	92	51	2.79	1.206	Moderate
			%	11.5	14.2	31.1	27.8	15.4			
6	**14**	This disease is not very dangerous.	*f*	57	82	72	37	83	2.62	1.872	Moderate
			%	17.2	24.8	21.8	11.2	25.1			
		Total score							**3.40**	**0.782**	**Moderate**

Fourth: Benefits of Hand Hygiene

The presented data in table (4.11) indicated that the benefits of hand hygiene among seventh to tenth students in North Hebron Directorate of Education schools, came at a high level, where the mean and standard deviation were (3.95±0.80). The highest score of benefits of hand hygiene was "the disease can be easily prevented by personal protective equipment" which had a very high score, with a mean and standard deviation (4.29±0.85). The least score was "feeling safe from infection by cleaning the hands", with a mean and standard deviation (3.95±0.80).

Table 4. 10: Frequency distribution of answers to questions based on benefits of hand hygiene

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
1	**13**	This disease can be easily prevented by personal protective equipment such as masks and disposable gloves	*f*	160	124	35	7	5	4.29	0.853	Very high
			%	48.3	37.5	10.6	2.1	1.5			
2	**15**	Hand hygiene will protect me completely from corona.	*f*	121	104	68	27	11	3.90	1.091	High
			%	36.6	31.4	20.5	8.2	3.3			
3	**12**		*f*	112	120	56	30	13	3.87	1.100	High

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
		This disease can be easily prevented by washing hands regularly with soap and water.	%	33.8	36.3	16.9	9.1	3.9			
4	**10**	I feel safe from infection by cleaning hands.	*f*	90	120	82	30	9	3.76	1.036	High
			%	27.2	36.3	24.8	9.1	2.7			
		Total score							**3.95**	**0.799**	**High**

Fifth: Barriers of Hand Hygiene

The data in table (4.12) showed that the barriers for hand hygiene among students of the seventh to tenth grades in the schools of the North Hebron Education Directorate had a low score, with mean and standard deviation (2.76±1.08). The highest score barrier for hand hygiene among students was "the scarcity of the masks at home" which had moderate score, with mean and standard deviation (3.31±1.61). The least barrier among students was "difficulty of not touching the mouth, nose and eyes", which had a low score, with mean and standard deviation (1.80±1.76).

Table 4. 11: Frequency distribution of answers to questions based on barriers of hand hygiene

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
1	**25**	The mask is scarce at home, so I do not wear a mask	*f*	83	110	70	35	33	3.53	1.251	Moderate
			%	25.1	33.2	21.1	10.6	10.0			
2	**21**	I always forget about hand hygiene.	*f*	60	114	89	47	21	3.44	1.130	Moderate
			%	18.1	34.4	26.9	14.2	6.3			
3	**26**	Hand hygiene gels and solutions are scarce and expensive in the market	*f*	62	119	66	53	31	3.39	1.224	Moderate
			%	18.7	36.0	19.9	16.0	9.4			
4	**24**	It is difficult to wash hands regularly with soap and water	*f*	65	101	67	59	39	3.28	1.290	Moderate
			%	19.6	30.5	20.2	17.8	11.8			
5	**23**		*f*	45	94	84	72	36	3.12	1.213	Moderate

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
		I don't have the patience to follow preventative instructions	%	13.6	28.4	25.4	21.8	10.9			
6	**22**	It is difficult to follow the instructions to prevent this disease.	*f*	37	96	84	69	45	3.03	1.222	Moderate
			%	11.2	29.0	25.4	20.8	13.6			
7	**20**	My hands get damaged during hand hygiene	*f*	49	76	74	74	58	2.95	1.323	Low
			%	14.8	23.0	22.4	22.4	17.5			
8	**27**	It is difficult not to touch hands, mouth, nose and eyes	*f*	26	48	68	116	73	2.51	1.207	Low
			%	7.9	14.5	20.5	35.0	22.1			
		Total score							**3.16**	**0.806**	**Low**

Sixth: Benefits of Social Distancing

The data in Table 4.13 showed that the benefits of social distancing among seventh to tenth students in North Hebron Directorate of Education schools had a high score, with mean and standard deviation (4.15±0.83). The highest score of benefits of social distancing among students was "social distancing protects against infection with the Coronavirus" which had a very high score, with mean and standard deviation (4.31±0.84). "Feeling of safety from the infection through applying social distancing" was the least. Which had a high score, with mean and standard deviation (3.98±1.03).

Table 4. 12: Frequency distribution of answers to questions based onbenefits of social distancing

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
1	**28**	Social distancing protects against Covid-19 infection	*f*	166	114	40	8	3	4.31	0.842	Very high
			%	50.2	34.4	12.1	2.4	0.9			
2	**29**	I feel safe from getting infected by applying social distancing	*f*	121	122	61	15	12	3.98	1.030	high
			%	36.6	36.9	18.4	4.5	3.6			
		Total score							**4.14**	**0.826**	**High**

Seventh: Barriers of Social Distancing

The data in table (4.14) presented that the berries of social distancing among seventh to tenth students in North Hebron Directorate of Education schools had a low score, as the total mean and standard deviation were (2.26±1.18). The highest barrier of social distancing among students was the effect of social distancing on students' relationship with their relatives and they feel bad when applying social distancing, both had low score, with a mean of (2.48). Followed by the students' forgetting to apply social distancing, which had a low level, with mean and standard deviation (2.32±1.70). The least barrier was the difficulty of staying at home, which had a very low score with mean and standard deviation (1.72±1.62).

Table 4. 13: Frequency distribution of answers to questions based on barriers of social distancing

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
1	**34**	Social distancing has affected my relationship with my relatives	*f*	43	74	78	64	72	2.85	1.338	Low
			%	13.0	22.4	23.6	19.3	21.8			
1	**31**	I feel a bad by applying social distancing	*f*	38	79	86	72	56	2.91	1.261	Low
			%	11.5	23.9	26.0	21.8	16.9			
2	**32**	I always forget to apply social distancing	*f*	31	60	106	76	58	2.79	1.203	Low
			%	9.4	18.1	32.0	23.0	17.5			
3	**33**	Social distancing has greatly affected my social relationships with my friends	*f*	41	64	76	78	72	2.77	1.322	Low
			%	12.4	19.3	23.0	23.6	21.8			
4	**30**	It is difficult to stay at home to prevent Coronavirus	*f*	25	31	70	92	113	2.28	1.237	Very low
			%	7.6	9.4	21.1	27.8	34.1			
		Total score							**2.72**	**0.935**	**Low**

Eighth: Cues to action

Table (4.15) indicated that the cues to action among seventh to tenth students in North Hebron Directorate of Education schools had a high score, as the mean and the standard deviation was (4.04±0.70). The highest cues to action for students was "the school published instructions of COVID-19 prevention" which had a very high score, with mean and standard deviation (4.37±0.92). The least important item was "the governmental encouragement to adopt healthy behavior to prevent the virus", as it had a high score with mean and standard deviation (3.63±1.18).

Table 4. 14: Frequency distribution of answers to questions based on cues to action

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
1	**40**	The school has published instructions for Coronavirus prevention	*f*	187	102	29	2	11	4.37	0.919	Very high
			%	56.5	30.8	8.8	0.6	3.3			
2	**37**	Family members encouraged me to follow preventive behavior for the disease.	*f*	139	131	45	11	5	4.17	0.893	High
			%	42.0	39.6	13.6	3.3	1.5			
2	**39**	Teachers encouraged me to follow preventive behavior for the disease	*f*	145	127	37	13	9	4.17	0.963	High
			%	43.8	38.4	11.2	3.9	2.7			
3	**35**	TV, radio and internet information about the disease were helpful	*f*	126	121	58	17	9	4.02	1.004	High
			%	38.1	36.6	17.5	5.1	2.7			
4	**38**	Educational/ Health counselor directed me to follow preventive behaviors for the disease	*f*	112	126	47	27	19	3.86	1.144	High
			%	33.8	38.1	14.2	8.2	5.7			
5	**36**	The government encouraged me to follow preventive behavior for the disease scales.	*f*	85	118	73	29	26	3.63	1.183	High
			%	25.7	35.6	22.1	8.8	7.9			
		Total score							**4.04**	**0.706**	**High**

Ninth: Ability for preventive behaviors (actual actions)

The data presented in table (4.16) showed that the students' ability to implement preventive behaviors had a high score, with mean and standard deviation (3.88±0.85). The highest indicator of the ability to implement preventive behaviors was "not sharing the mask, the cup and the plate with others", which had a very high score, with mean and standard deviation (4.27±1.14). The least was "not shaking hands with others", as it got a high score with mean and standard deviation (3.44±1.26).

Table 4. 15: Frequency distribution of answers to questions based on actual actions

Order	No.	The item		S. Agree	Agree	Neutral	Dis-agree	S. Dis-agree	Mean	STD	Score
1	**45**	I do not share my mask, cup, dish with others.	*f*	206	59	32	18	16	4.27	1.141	Very high
			%	62.2	17.8	9.7	5.4	4.8			
2	**43**	I wash my hands with soap immediately after entering home	*f*	159	90	61	12	9	4.14	1.019	High
			%	48.0	27.2	18.4	3.6	2.7			
3	**41**	I wear a mask before leaving home	*f*	120	89	84	18	20	3.82	1.161	High
			%	36.3	26.9	25.4	5.4	6.0			
4	**42**	I keep a safe distance with others (at least 1 m)	*f*	102	108	74	28	19	3.74	1.151	High
			%	30.8	32.6	22.4	8.5	5.7			
5	**44**	I do not shake hands with others	*f*	88	75	93	46	29	3.44	1.260	High
			%	26.6	22.7	28.1	13.9	8.8			
		Total score							**3.88**	**0.848**	**High**

Overall, Table (4.17) showed the total score of HBM constructs which indicated the seventh to tenth students in North Hebron Directorate of Education preventive behavior toward COVID-19. The total HBM score was high, as the mean and standard deviation were (3.50±0.45). The highest HBM construct was the perceived self-efficacy, which had a very high score, the mean and standard deviation were (4.38±0.49). The least was barriers of social distancing, which had a low score with mean and standard deviation (2.26±1.18).

Table 4. 16: Mean and standard deviations of total health belief constucts

The statement	Mean	SD	Score
Perceived Self-efficacy	4.38	0.490	Very high
Perceived Susceptibility	3.20	0.845	Moderate
Perceived Severity	3.40	0.782	Moderate
Benefits of Hand Hygiene	3.95	0.799	High
Barriers for Hand Hygiene	2.76	1.080	Moderate
Benefits of Social Distancing	4.15	0.825	High
Barriers for Social Distancing	2.26	1.182	Low
Cues to Action	4.04	0.706	High
Actual Actions	3.88	0.848	High
Total	**3.50**	**0.452**	**Moderate**

4.3.6 Answering the fifth question: What is the relationship between socio-demographic variables and preventive behaviors toward COVID-19 among seventh to tenth students?

a. Univariate Analysis

The univariate analysis indicated that the place of residence, parents work in healthcare professions, and perceived susceptibility had significant effects on preventive behaviors from COVID-19. In place of residence the highest percentage in both (<14 years and >14 years) significance difference was in villages (67.8%, 57.4%). None of parents are working in healthcare professions had the highest significance difference in both categories (70.4%, 82.9%). In perceived susceptibility the strong belief had highest percentages of both age categories (53.9%, 58.3%) (see Table 4.17).

Table 4. 17: Univariate regression of demographic variables and students' preventive behavior toward COVID-19

Variables		Age Category		P value of Chi Square
		< 14 years N (%)	≥ 14 years N (%)	
Residence	City	36 (31.3%)	55 (25.5%)	0.000
	Village	78 (67.8%)	124 (57.4%)	
	Camp	1 (0.9%)	37 (17.1%)	
Father's level of education	High school or less	48 (41.7%)	100 (46.3%)	0.685

Variables		Age Category		P value of Chi Square
		< 14 years N (%)	≥ 14 years N (%)	
	Diploma or bachelor	44 (38.3%)	70 (32.4%)	
	Higher Studies	7 (6.1%)	11 (5.1%)	
	Other	16 (13.9%)	35 (16.2%)	
Mother's level of education	High school or less	37 (32.2%)	77 (35.6%)	0.699
	Diploma or bachelor	56 (48.7%)	92 (42.6%)	
	Higher Studies	9 (7.8%)	16 (7.4%)	
	Other	13 (11.3%)	31(14.4%)	
Parents work in healthcare professions	One parent	24 (20.9%)	28 (13.0%)	0.028
	Both Parents	10 (8.7%)	9 (4.2%)	
	None	81 (70.4%)	179 (82.9%)	
Birth order	First	32 (27.8%)	53 (24.5%)	0.617
	Second	21 (18.3%)	37 (17.1%)	
	Third	22 (19.1%)	34 (15.7%)	
	Fourth	11 (9.6%)	32 (14.8%)	
	Other	29 (25.2%)	60 (27.8%)	
Crowding index	<1 person per room	16 (13.9%)	22 (10.2%)	0.545
	1-2 persons per room	78 (67.8%)	157 (72.7%)	
	>2 persons per room	21 (18.3%)	37 (17.1%)	
Perceived Self-efficacy	Strong Belief	115 (100.0%	208 (96.3%)	0.113
	Neutral/No Belief	0.0%	3 (1.4%)	
	Poor Belief	0.0%	5 (2.3%)	
Perceived Susceptibility	Strong Belief	62 (53.9%)	126 (58.3%)	0.007
	Neutral/No Belief	8 (7.0%)	35 (16.2%)	
	Poor Belief	45 (39.1%)	55 (25.5%)	
Perceived Severity	Strong Belief	85 (73.9%)	160 (74.1%)	0.398
	Neutral/No Belief	6 (5.2%)	19 (8.8%)	
	Poor Belief	24 (20.9%)	37 (17.1%)	
Benefits of Hand Hygiene	Strong Belief	97 (84.3%)	185 (85.6%)	0.884
	Neutral/No Belief	6 (5.2%)	12 (5.6%)	
	Poor Belief	12 (10.4%)	19 (8.8%)	
Barriers for Hand Hygiene	Strong Belief	33 (28.7%)	85 (39.4%)	0.155
	Neutral/No Belief	9 (7.8%)	15 (6.9%)	
	Poor Belief	73 (63.5%)	116 (53.7%)	
Benefits of Social Distancing	Strong Belief	95 (82.6%)	178 (82.4%)	0.991
	Neutral/No Belief	14 (12.2%)	26 (12.0%)	
	Poor Belief	6 (5.2%)	12 (5.6%)	

Variables		Age Category		P value of Chi Square
		< 14 years N (%)	≥ 14 years N (%)	
Barriers for Social Distancing	Strong Belief	69 (60.0%)	128 (59.3%)	0.454
	Neutral/No Belief	5 (4.3%)	17 (7.9%)	
	Poor Belief	41 (35.7%)	71 (32.9%)	
Cues to Action	Strong Belief	105 (91.3%	190 (88.0%)	0.637
	Neutral/No Belief	5 (4.3%)	12 (5.6%)	
	Poor Belief	5 (4.3%)	14 (6.5%)	
Ability for preventive behaviors (actual actions)	Strong Belief	87 (75.7%)	181 (83.8%)	0.104
	Neutral/No Belief	9 (7.8%)	16 (7.4%)	
	Poor Belief	19 (16.5%)	19 (8.8%)	

b. Multivariate analysis

Multiple regression also indicated that in addition to the place of residence and perceived susceptibility, perceived severity and ability for preventive behaviors were associated with preventive behaviors from COVID-19, while the "Parents work in healthcare professions" variable lost its significance. In this regard, students who lived in villages and camps had less preventive behaviors than who lived in the city (OR=.027, 95% CI .003-.224) and (OR=.032, 95% CI .004-.254) respectively. In perceived susceptibility; students who had "poor belief" are 3.543 folds higher than "strong belief" (OR=3.543, 95%CI 1.346-9.322). In addition, students who had "poor belief" had 3.503 folds perceived severity than who had "strong belief", although strong belief was not significant. The regression also showed that students who had "neutral" ability for preventive behaviors had 2.492 folds higher than "strong belief" (OR=2.492, 95%CI 1.024-6.067) although strong belief was not significant (p-value=.132).

Other variables were not found to be significantly contributing preventive behaviors toward COVID-19 (see Table 4.17, 4.18).

Table 4. 18: Multivariate regression of demographic variables and students' preventive behavior toward COVID-19.

Variables		OR	95% C.I.	P value
Residence	City			.004
	Village	.027	.003-.224	.001
	Camp	.032	.004-.254	.001
Father's level of education	High school or less			.904
	Diploma or BA	.914	.362-2.307	.848
	Higher Studies	.738	.275-1.978	.546
	Other	.822	.197-3.422	.788
Mother's level of education	High school or less			.762
	Diploma or BA	.646	.238-1.754	.391
	Higher Studies	.613	.223-1.686	.343
	Other	.862	.205-3.630	.840
Parents work in healthcare professions	One parent			.141
	Both Parents	.498	.235-1.054	.068
	None	.557	.179-1.728	.311
Birth order	First			.327
	Second	.786	.378-1.634	.520
	Third	.769	.335-1.762	.534
	Fourth	.563	.244-1.301	.179
	Other	1.668	.6524.271	.286
Crowding index	<1 person per room			.241
	1-2 persons per room	.878	.322-2.396	.799
	>2 persons per room	1.558	.774-3.136	.215
Perceived Self-efficacy	Strong Belief			1.000
	Neutral/No Belief	.000	0	.999
	Poor Belief	.257	0	1.000
Perceived Susceptibility	Strong Belief			.030
	Neutral/No Belief	1.632	.893-2.982	.111
	Poor Belief	3.543	1.346-9.322	.010
Perceived Severity	Strong Belief			.117
	Neutral/No Belief	1.162	.552-2.445	.693
	Poor Belief	3.503	1.016-12.075	.047
Benefits of Hand Hygiene	Strong Belief			.993

Variables		OR	95% C.I.	P value
Barriers for Hand Hygiene	Neutral/No Belief	.985	.379-2.558	.975
	Poor Belief	1.059	.246-4.553	.938
	Strong Belief			.179
Benefits of Social Distancing	Neutral/No Belief	1.798	.966-3.345	.064
	Poor Belief	1.293	.436-3.840	.643
	Strong Belief			.572
Barriers for Social Distancing	Neutral/No Belief	1.383	.379-5.039	.623
	Poor Belief	.841	.187-3.774	.821
	Strong Belief			.646
Cues to Action	Neutral/No Belief	.780	.429-1.421	.417
	Poor Belief	1.177	.301-4.599	.815
	Strong Belief			.751
Ability for preventive behaviors (actual actions)	Neutral/No Belief	.761	.205-2.824	.683
	Poor Belief	1.252	.203-7.709	.809
	Strong Belief			.132
	Neutral/No Belief	2.492	1.024-6.067	.044
	Poor Belief	2.096	.575-7.646	.262

Chapter Five:

Discussion, Conclusion and Recommendations

This chapter interpreted the study main results with previous studies. Then conclusion and recommendations were mentioned next.

Discussion

This study was implemented to investigate the knowledge, attitudes, and preventive behaviors toward COVID-19 of seventh to tenth students in North Hebron Directorate of Education governmental schools with usage of HBM to get better assessment.

The results showed that there were significant differences at the significance level ($p \leq 0.05$) in the students' assessment of their current health status (p value =0.033), PCR testing of COVID-19 (p value =0.047), presence any respiratory symptoms in the last 14 days (p value= 0.050), knowing people experienced infection with COVID-19 (p value=0.025), having chronic disease (p value=0.033). While there were no significance differences value at the level ($p \leq 0.05$) in the result of PCR test as (p value=0.445), receiving any medical consultation the past month (p value=0.532), traveling outside Palestine during the past month (p-value =0.466).

Clements (2020) cited that higher level of knowledge leads to higher understand and trust of science. Which lead to the assumption that the better knowledge would lead to higher willingness to follow public health recommendations toward COVID-19.

Students from grades seventh to tenth had in general moderate score of knowledge toward COVID-19 with no significant difference between grades. The most common knowledge for the participants were; (91%) for groups at higher risk for the disease, (89%) for symptoms, (82%) and (87%) for transmission modes (direct and indirect) and (81%) for infectivity of the virus (see Table 4.5).

This goes along with Erfani et al., (2020) as they mentioned that the participants aged (15 and above) had a moderate knowledge, (90%) the characteristics of the disease and 85% for the transmission routes and groups at higher risk for the disease. Souli and Dilucca (2020) sited that Secondary school students aged (14-18) present a good level of knowledge about signs and symptoms the disease, the basic hygiene principles, the modes of transmission and the preventive

measures against virus transmission. Dardas and others (2020) also mentioned that the participants aged (12 to 18) showed that the majority of participants had a good level of knowledge toward COVID-19. Tomar and others (2021) also declared that the study population had total knowledge score was 80.64%. They cited that in multiple linear regression analysis, male gender, urban population, higher education, and higher occupation ($\beta = 0.036$: $P < 0.001$), ($\beta = 0.006$: $P < 0.002$), ($\beta = 0.029$: $P < 0.001$), and ($\beta = 0.002$: $P = 0.05$) accordingly, were associated significantly with high knowledge score. Hatami et al., 2021 mentioned that (90%) of high school students had the knowledge about COVID-19 (causes, routes of transmission, and the renowned symptoms.) Social-and- audiovisual-media were the leading information source. Alves et al., (2020) also declared that the participants (higher education students) showed a good level of knowledge about COVID-19.

While Barakat & Kasemy (2020) held a three stages cross-sectional study, in the first stage the participants aged 18 years or above showed a low level of knowledge about COVID-19. Also, Ruiz-Aquino et al., (2021) cited that (62.5%) of the participants showed lower perception of knowledge about COVID-19. Handebo et al., (2021) also mentioned that only one-fourth of the high school participants had a good knowledge about COVID-19.

There are various sources of information for the population about COVID-19 about; mortality and morbidity rates, symptoms, transmission routs, preventive measures, variants, …etc. from which they could be updated with the current situation.

In this study (65.9%) of the students got their knowledge about COVID-19 from the Palestinian MOH. Followed by schools/ teachers and social media with percentage (42.6%) and (42.3%) respectively. Which consider good as (66%) of the students follow MOH instructions and reliable source of information. On the other hand, radio had the least percentage (see Table 4.7).

It is important to mention the role of MOE (school health department) in students' knowledge about COVID-19 and other health issues, as they are in touch with students at schools and they are paying efforts in various health promotion programs to raise student's knowledge and behavior toward COVID-19 pandemic and other health related issues

Social media has a significant effect on population knowledge of COVID-19(Mahmood et al., 2021), as many studies declared it as main source of information regardless the age. Erfani and others (2020) in their study revealed that social media has the percentage of (82.9%) as source of

information of the study participants. They also mentioned that there was a significant correlation between higher knowledge, and source of information from social media, scientific articles and journals.

Souli and Dilucca (2020) sited that the participants' most reported source of knowledge was television, followed by social media, whereas the less was the school. Abdelhafiz and others also mentioned that social media (66.9%) was the main source of knowledge followed by the internet (58.3%). Tomar and others shared that the most sources of COVID-19 protective measures information were broadcast media, printed media, the internet, university, and social media. They cited that, students who used print media and university as source of information showed better levels knowledge and attitude. Hatami and others mentioned that the leading source of information was social-and- audiovisual-media.

The participants students had a high score positive attitude and moderate score of positive preventive behavior toward COVID-19, with no significant difference between grades, as (80%) of students believed that COVID-19 exist and (89%) think that COVID-19 could be preventable. The grade seventh had the most positive attitude toward COVID-19 and ninth had the least. In Dardas and others (2020) study who had a close age group, declared that the study sample had a positive attitudes and behaviors toward protective measures with small but significant percentage of them who had negative attitudes toward protective measures and engaged in high-risk practices associated with spreading the virus. Tomar and others (2021) also had a high score of positive attitude toward COVID-19. Alves et al., (2020) also sited that the students showed highly positive attitudes to preventive behaviors and risk perceptions. On the other hand, Ruiz-Aquino et al., (2021) cited that the type of attitudes viewed by citizens towards COVID-19 revealed that 63.1% of respondents had negative attitudes. Hatami et al., (2021) also stated that (80%) of the participants had positive preventive behaviors toward COVID-19.

Health Belief Model is widely used in health studies that related to social science. The researcher used HBM to understand student's preventive behaviors toward COVID-19.

The study participants showed a very high level in the perceived self-efficacy. Which means that students had a high confidence to do the recommended protective behaviors and preventive actions successfully and overcome perceived barriers to control COVID-19 spreading.

The students showed a low score of perceived barriers of hand hygiene and social distancing, which could be explained in two different point of view, the first one; students have a good and positive perception toward protective measures of COVID-19. On the other hand, the second explanation could be that students do not pay attention about preventive measures, as they think that COVID-19 is away from them.

Many previous studies declared that there is a significant difference between demographic data and participants. As Nasir et al., (2020) mentioned in their study that the HBM constructs are correlated socio-demographic factors. Also, Barakat & Kasemy (2020) revealed that there were an association between age, high education, being a health care worker to perceived susceptibility, benefits, barriers and self-efficacy.

In this study, the socio-demographic variables showed a significant difference in place of residence and parent's working in health professions. While other socio-demographic variables did not have significant different in relation to HBM constructs. This could be explained as the participants had almost the same socio-demographic situation and characteristics. The variance may be clear in larger populations with more regions.

Conclusion

To the best of our knowledge, the current study is the first in Palestine used HBM as a conceptual framework for exploring students' preventive behaviors toward COVID-19. During the analysis, there were no significant difference or correlation with several variables which could be justified to the study community composition close characteristics (socio-economical level), which means they had the same knowledge and perceptions, and provided with the same health promotion programs from MOH and MOE toward COVID-19. Moreover, the participants age group may have less ability to understand the questions (of the survey) and/or express their beliefs. The emerged situation due to COVID-19 and the new variants, raised the need for health education and promotion programs that promote hygiene practices in schools and community to break the chain of the virus transmission of between students, staff, and school community. National and international institutions with interest to health should cooperate to support health promotion programs in schools that meet students' needs to adopt preventive behaviors toward COVID-19. This study provides an assessment of students' the knowledge, attitude and behavior of students

toward COVID-19, so it will help MOE and MOH and related institution to put strategies to COVID-19 prevention plan and programs for effective interventions.

Study Limitations

The limitations of this study were….

- Various public restrictions were implemented due to COVID-19 (the closures and limitations on gatherings), and ultimately schools close and a "shelter at home" order were announced while the research was being carried out.
- The researcher chose the southern governorate Bethlehem and Hebron before applying the study, but because of the COVID-19 lockdown and restrictions on preventing movement between the governorates and cities, the study was limited and recruited to the N. Hebron Directorate, which affected the sample size and variety.
- The late of approving the data collection request (Research Facilitation Letter) by (CERD) at MOE until the beginning of May 2021, which affected the response rate.
- The researcher used online survey like Google Forms to reach all targeted students. Distributing the survey through the internet let only those who can read and have internet access to participate. This represents a major limitation of this study.
- Students filled the online survey at home which led to information bias.
- Social desirability bias students selected the ideal answer in order to present themselves as good and ideal one.

Strength of the study

This study could be one of studies that support the relationship between healthy behavior theory and practice. Also, it emphasizes the role of health awareness and promotion in reducing confirmed cases of COVID-19 among students by understanding the methods of behavior modification. Furthermore, this study suggests solutions that could be applied in school field. The study has a valid and reliable study instrument and could be good reference and base for other researches. In addition, the study enabled the researcher to have a valuable knowledge about students' attitude and behavior towards COVID-19 infection and how they affect their life. Fourth, it helps the design makers to have an insight about the situation at our schools and then help them to make suitable

plans to fit the real situation. Fifth, the data was collected in real condition which is through the time of COVID-19 spread. Sixth, the researcher used HBM, which will help other researchers to compare their data with the research data to have better understanding of students' health behavior.

Recommendations

a) MOH

- Public health intervention programs should focus on students' self-efficacy for promoting preventive practices and behaviors.
- Self-efficacy must be considered as a powerful element of belief and health perceptions in any intervention plan toward COVID-19.

b) MOE

- Ministry of Education and schools should enhance students' knowledge and preventive behaviors toward COVID-19 through curricular and extracurricular activities.
- Provide teachers and staff with continuous school health promotion education programs offering in-service training and support in planning and implementing activities to promote healthy and preventive behaviors.
- Formulate the role of parents especially mothers in school health promotions, by engaging them in planning and implementing healthy school programs including the encouragement adopting healthy and preventive behaviors like personal hygiene toward any infectious disease, in general, and specially COVID-19. Parental involvement helps in applying these healthy behaviors at home environment.
- Recruiting more school health field worker employees at the school health department to cover more schools with health promotion programs.
- Social media platforms should effectively be used by MOH and health related institutions to elevate community awareness toward COVID-19.

c) Teachers

- Teachers and school staff should be a role model to students to build up the positive attitudes.

d) Further researches

- More researches are needed with use of open-ended questions, interviews or focus group discussion that could provide better assessment of participants' knowledge, attitudes and behaviors toward COVID-19.

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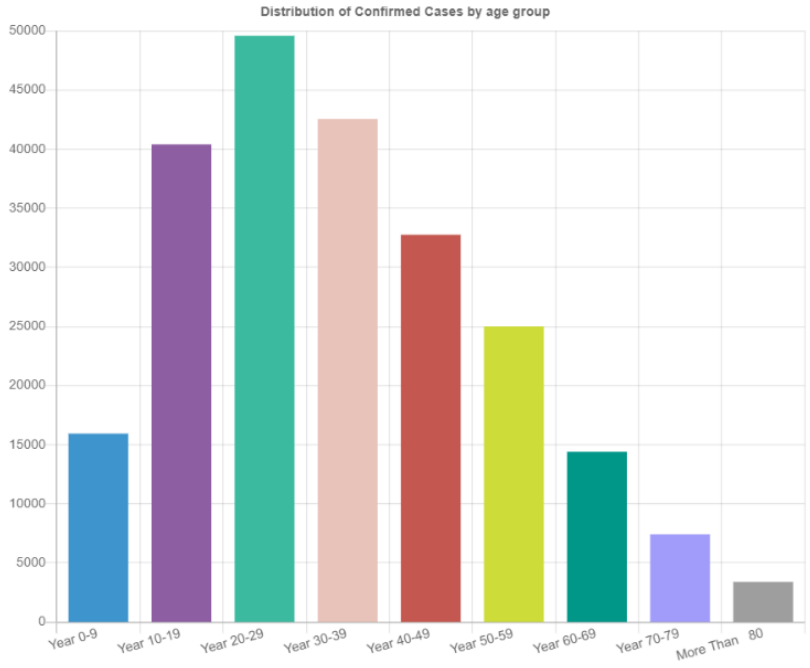
Appendices

Appendix 1: Distribution of Confirmed Cases by age group.

Source: CORONAVIRUS - COVID19 Surveillance System (27.11.2021)

http://site.moh.ps/index/covid19/LanguageVersion/0/Language/ar



Distribution of Confirmed Cases by age group		
Category	**Number**	**Percentage %**
0-9 Year	15935	3.71 %
10-19 Year	40407	9.41 %
20-29 Year	49587	11.55 %
30-39 Year	42546	9.91 %
40-49 Year	32754	7.63 %
50-59 Year	25007	5.82 %
60-69 Year	14394	3.35 %
70-79 Year	7408	1.73 %
=> 80 Year	3393	0.79 %
unknown age	197904	46.1 %
Total	**429335**	**100%**

Appendix 2:Distribution of confirmed cases by Governorate and sex.

Source: CORONAVIRUS - COVID19 Surveillance System (27.11.2021)

http://site.moh.ps/index/covid19/LanguageVersion/0/Language/ar

confirmed cases Statistic by Areas

Distribution of confirmed cases by sex without jerusalem city						
	Male		Female		Total	
Governorates	Number	Percentage %	Number	Percentage %	Number	Percentage %
Bethlehem	10741	55.93 %	8462	44.07 %	19203	4.47 %
Hebron	23972	49.43 %	24522	50.57 %	48494	11.3 %
Jenin	12586	48.96 %	13120	51.04 %	25706	5.99 %
Jericho	2671	49.8 %	2692	50.2 %	5363	1.25 %
Jerusalem	5518	47.24 %	6164	52.76 %	11682	2.72 %
Jerusalem City		%		%	0	0 %
Nablus	21567	48.38 %	23010	51.62 %	44577	10.38 %
Qalqilya	5061	45.68 %	6019	54.32 %	11080	2.58 %
Ramallah	18864	49.47 %	19267	50.53 %	38131	8.88 %
Salfit	4183	44.8 %	5154	55.2 %	9337	2.17 %
Tubas	2913	46.71 %	3324	53.29 %	6237	1.45 %
Tulkarm	10460	46.13 %	12215	53.87 %	22675	5.28 %
Gaza	93449	50.01 %	93397	49.99 %	186846	43.52 %
Dair Albalah	0	%	0	%	0	0 %
North Gaza	1	100 %	0	0 %	1	0 %
Khanyounes	1	50 %	1	50 %	2	0 %
Rafah	0	0 %	1	100 %	1	0 %
Total	**211987**	**49.38 %**	**217348**	**50.62 %**	**429335**	**100 %**

Appendix 3:Distribution of Death cases by Governorates.

Source: CORONAVIRUS - COVID19 Surveillance System. (27.11.2021)

http://site.moh.ps/index/covid19/LanguageVersion/0/Language/ar

Distribution of Death cases by Governorates		
Governorates	**Number of registered cases**	**Percentage %**
Bethlehem	250	5.2 %
Hebron	610	12.7 %
Jenin	325	6.8 %
Jericho	56	1.2 %
Jerusalem	100	2.1 %
Jerusalem City	268	5.6 %
Nablus	549	11.5 %
Qalqilya	193	4 %
Ramallah	328	6.8 %
Salfit	101	2.1 %
Tubas	70	1.5 %
Tulkarm	302	6.3 %
Gaza	1639	34.2 %
Dair Albalah	0	0 %
North Gaza	1	0 %
Khanyounes	0	0 %
Rafah	0	0 %
Total	**4792**	**100 %**

Distribution of Recover cases by Governorates		
Governorates	**Number of registered cases**	**Percentage %**
Bethlehem	18759	4.1 %
Hebron	47397	10.5 %
Jenin	25250	5.6 %
Jericho	5281	1.2 %
Jerusalem	11544	2.6 %
Jerusalem City	30088	6.7 %
Nablus	43954	9.7 %
Qalqilya	10872	2.4 %
Ramallah	37512	8.3 %
Salfit	9234	2 %
Tubas	6117	1.4 %
Tulkarm	22325	4.9 %
Gaza	183869	40.7 %
Dair Albalah	0	0 %
North Gaza	0	0 %
Khanyounes	2	0 %
Rafah	0	0 %
Total	**452204**	**100 %**

Appendix 4: Estimated Population by Governorate

جدول 3: عدد السكان المقدر في دولة فلسطين حسب المحافظة، نهاية عام 2020
Table 3: Estimated Population in the State of Palestine by Governorate, End Year 2020

Governorate	النسبة Percent	عدد السكان Number of Population	المحافظة
State of Palestine	**100.0**	**5,164,173**	**دولة فلسطين**
West Bank	**59.8**	**3,086,816**	**الضفة الغربية**
Jenin	6.5	335,485	جنين
Tubas & Northern Valleys	1.3	65,211	طوباس والأغوار الشمالية
Tulkarm	3.8	197,098	طولكرم
Nablus	8.0	411,680	نابلس
Qalqiliya	2.3	120,357	قلقيلية
Salfit	1.6	81,162	سلفيت
Ramallah & Al-Bireh	6.8	351,510	رام الله والبيرة
Jericho & Al Aghwar	1.0	52,836	أريحا والأغوار
Jerusalem	9.0	466,750	القدس
Bethlehem	4.5	232,343	بيت لحم
Hebron	15.0	772,384	الخليل
Gaza Strip	**40.2**	**2,077,357**	**قطاع غزة**
North Gaza	7.9	410,181	شمال غزة
Gaza	13.6	704,727	غزة
Dier al Balah	5.8	298,384	دير البلح
Khan Yunis	7.9	407,655	خانيونس
Rafah	5.0	256,410	رفح

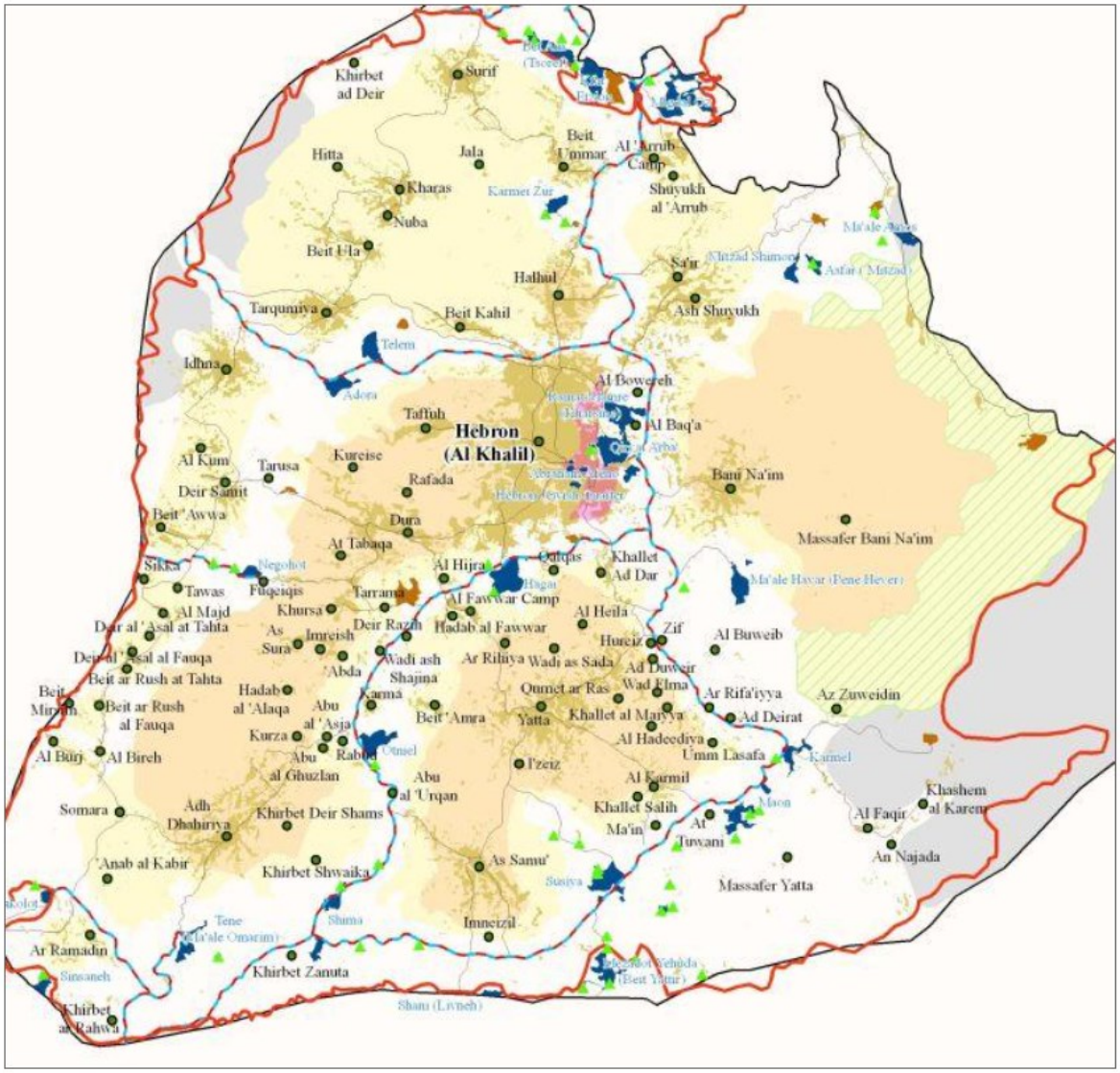
جدول 4: عدد السكان المقدر في دولة فلسطين حسب العمر والمنطقة والجنس، نهاية عام 2020

Table 4: Estimated Population in the State of Palestine by Age, Region and Sex, End Year 2020

Age	قطاع غزة Gaza Strip			الضفة الغربية West Bank			دولة فلسطين State of Palestine			العمر
	إناث Females	ذكور Males	كلا الجنسين Both Sexes	إناث Females	ذكور Males	كلا الجنسين Both Sexes	إناث Females	ذكور Males	كلا الجنسين Both Sexes	
0-4	152,436	158,622	**311,058**	195,097	203,734	**398,831**	347,533	362,356	**709,889**	4-0
5-9	138,265	144,736	**283,001**	179,310	189,456	**368,766**	317,575	334,192	**651,767**	9-5
10-14	127,435	133,408	**260,843**	167,057	174,932	**341,989**	294,492	308,340	**602,832**	14-10
15-19	103,857	108,766	**212,623**	154,691	160,988	**315,679**	258,548	269,754	**528,302**	19-15
20-24	92,254	95,934	**188,188**	143,695	150,857	**294,552**	235,949	246,791	**482,740**	24-20
25-29	93,370	95,470	**188,840**	132,894	141,687	**274,581**	226,264	237,157	**463,421**	29-25
30-34	76,193	77,094	**153,287**	111,400	116,585	**227,985**	187,593	193,679	**381,272**	34-30
35-39	56,017	55,310	**111,327**	87,769	88,333	**176,102**	143,786	143,643	**287,429**	39-35
40-44	45,743	45,319	**91,062**	76,722	77,998	**154,720**	122,465	123,317	**245,782**	44-40
45-49	36,587	37,063	**73,650**	68,100	71,008	**139,108**	104,687	108,071	**212,758**	49-45
50-54	28,611	29,701	**58,312**	56,998	60,042	**117,040**	85,609	89,743	**175,352**	54-50
55-59	24,840	26,634	**51,474**	46,095	49,048	**95,143**	70,935	75,682	**146,617**	59-55
60-64	17,098	17,248	**34,346**	34,088	35,610	**69,698**	51,186	52,858	**104,044**	64-60
65-69	12,858	12,062	**24,920**	22,155	22,057	**44,212**	35,013	34,119	**69,132**	69-65
70-74	8,938	8,238	**17,176**	15,572	14,270	**29,842**	24,510	22,508	**47,018**	74-70
75-79	4,853	4,011	**8,864**	10,531	8,271	**18,802**	15,384	12,282	**27,666**	79-75
80+	5,279	3,107	**8,386**	12,010	7,756	**19,766**	17,289	10,863	**28,152**	+80
Total	**1,024,634**	**1,052,723**	**2,077,357**	**1,514,184**	**1,572,632**	**3,086,816**	**2,538,818**	**2,625,355**	**5,164,173**	**المجموع**

Appendix 6: Hebron Governorate Cities, Towns and Refugee Camps.

Source: ARIJ: The Palestinian Community Profiles and Needs Assessment- Hebron



Appendix 7: North Hebron Directorate of Education School

مدارس مديرية شمال الخليل الحكومية 2020/2021

المنطقة	الرقم	اسم المدرسة
حلحول	1	حلحول الثانوية للبنين
	2	الرشيد الاساسية للبنين
	3	صلاح الدين الاساسية للبنين
	4	الصفا الأساسية المختلطة
	5	محمود التوايهة الأساسية للبنين
	6	عمر التميمي الاساسية للبنين - أ
	7	عمر التميمي الثانوية للبنين - ب
	8	الفسطل الأساسية للبنين
	9	حلحول الثانوية للبنات
	10	القادسية الثانوية للبنات
	11	اليرموك الأساسية للبنات
	12	فلسطين الأساسية للبنات
	13	شهداء حلحول الأساسية للبنات
	14	المعتصم الاساسية للبنات
	15	الإسراء الأساسية للبنين
	16	الوفاق الأساسية للبنات
	17	الصخرة المشرفة الأساسية المختلطة
الشيوخ	18	الشيوخ الثانوية للبنين
	19	شهداء الشيوخ الاساسية للبنين
	20	الحاج عيسى المشني الاساسية للبنين
	21	الحاج علي اسعيفان الاساسية للبنين
	22	دلال المغربي الاساسية للبنات
	23	الشهيد ياسر عرفات س للبنات
	24	الشفا الأساسية المختلطة
	25	شيوخ العروب الأساسية المختلطة
	26	الشهيد يزن الثانوية للبنات
	27	مصعب بن عمير الأساسية للبنات
سعير	28	سعير الثانوية للبنين
	29	العديسة الاساسية للبنين
	30	اسماعيل الفروخ الاساسية للبنين
	31	عبد القادر جرادات الاساسية للبنين
	32	صفد الأساسية للبنين
	33	الدوارة الاساسية للبنين
	34	وادي الريم الاساسية المختلطة
	35	حمزه بن عبد المطلب الاساسية للبنين
	36	كويزيبا الاساسية للبنين
	37	سعير الثانوية للبنات
	38	سعير الأساسية للبنات
	39	المروة الأساسية المختلطة
	40	ماريا القبطية الأساسية للبنات
	41	صفية الاساسية للبنات
	42	الدوارة الثانوية للبنات
	43	العديسة الأساسية للبنات
	44	بيسان الأساسية للبنات
	45	زين الدين الاساسية المختلطة
	46	الكرامة الأساسية للبنات
	47	عمر بن عبد العزيز الثانوية للبنات
نوبا	48	نوبا الثانوية للبنين
	49	نوبا خاراس الاساسية للبنين
	50	نوبا الثانوية للبنات
	51	نوبا خاراس الأساسية للبنات
	52	الهدى الأساسية للبنات
	53	حتا الأساسية المختلطة

المنطقة	الرقم	اسم المدرسة
بني نعيم	54	بني نعيم الثانوية للبنين
	55	بني نعيم الاساسية للبنين
	56	التقوى الاساسية للبنين
	57	موسى بن نصير الاساسية للبنين
	58	طارق بن زياد الأساسية للبنين
	59	الكندي الاساسية للبنين
	60	عربية الاساسية المختلطة
	61	بادية بني نعيم الاساسية المختلطة
	62	بني نعيم الثانوية للبنات
	63	بني نعيم الأساسية للبنات
	64	السحابة الأساسية للبنات
	65	يافا الأساسية للبنات
	66	شهداء بني نعيم الأساسية للبنات
	67	ام الرشراش الأساسية للبنات
	68	ياقين الأساسية للبنات
	69	بيرين الأساسية المختلطة
	70	ماهر مواس س المختلطة
	71	حيفا الأساسية المختلطة
بيت امر	72	بيت امر الثانوية للبنين
	73	بيت امر الاساسية للبنين
	74	الحسن بن الهيثم الاساسية للبنين
	75	صافا الاساسية للبنين
	76	جالا الاساسية المختلطة
	77	بيت امر الثانوية للبنات
	78	بيت امر الأساسية للبنات
	79	زهرة المدائن الأساسية للبنات
	80	بيت امر الأساسية المختلطة
	81	عسقلان الأساسية للبنات
	82	صافا الأساسية للبنات
صوريف	83	عمرو بن العاص الاساسية للبنين
	84	بلال بن رباح الاساسية للبنين
	85	صوريف الثانوية للبنين
	86	صوريف الاساسية للبنين
	87	شهداء صوريف الاساسية للبنين
	88	صوريف الثانوية للبنات
	89	الفاروق الثانوية للبنات
	90	الدير الاساسية المختلطة
خاراس	91	خاراس الثانوية للبنين
	92	شهداء خاراس الاساسية للبنين
	93	خالد بن الوليد الاساسية للبنين
	94	خاراس الثانوية للبنات
	95	خاراس الأساسية للبنات
	96	الخنساء الأساسية للبنات
بيت أولا	97	بيت اولا الثانوية للبنين
	98	بيت اولا الاساسية للبنين
	99	شهداء بيت أولا الأساسية للبنين
	100	جابر بن حيان الاساسية للبنين
	101	بئر القوس الاساسية للبنين
	102	بيت اولا الثانوية للبنات
	103	أبو قاسم الشابي الأساسية للذكور
العروب	104	العروب الثانوية للبنات
	105	العروب الثانوية للبنين
	106	العروب الزراعية الثانوية المختلطة

Appendix 8: North Hebron region characteristics

North Hebron region characteristics:

Halhul: Halhul is a city in the Hebron Governorate. It is located southern the West Bank, five kilometers to the north from Hebron city, and 30 kilometers from Jerusalem, 25 kilometers from the Dead Sea and 60 kilometers from the Mediterranean Sea. Halhul is considered the highest inhabited place in Palestine about (1,027) meters above the sea level (Halhul Municipality, 2018). To the east; it is bordered by Sa'ir and Al-Shuyukh towns, to the north; Beit Ummar and Al Arrub Camp, to the west; Kharas and Nuba, and to the south; it is bordered by Hebron city and Beit Kahil (ARIJ, 2009f). According to the Palestinian Central Bureau of Statistics, the total population of Halhul city in 2020 was 28,981 (PCBS, 2021).

Sa'ir: Sa'ir is a town in Hebron Governorate. It is located southern the West Bank, eight kilometers to the northeast of Hebron city. To the east; it is bordered by the Dead Sea, to the north; Beit Fajjar and Al Arroub camp, to the north; to the west; Halhul, and to the south; Al Shuyukh and Bani Na'im. Sa'ir town is located in a mountainous area at an elevation of 906 meters above sea level(Arij, 2009). According to the Palestinian Central Bureau of Statistics, the total population of Sa'ir town in 2020 was 22,217 (PCBS, 2021).

Al-Shuyukh: or Ash-Shuyukh is a Palestinian town in the Hebron Governorate. It is located six kilometers northeast of the Hebron city. Also, it extends over a mountainous area (Hebron Mountains) at an elevation of 965 meters above sea level. Like the rest of the Hebron area, Al-Shuyukh is an agricultural area. It is bordered by Sa'ir town from three sides (north, west, and south), and by openspaces to the east (ARIJ, 2009b). According to the Palestinian Central Bureau of Statistics, Ash-Shuyukh had a population of over 12,922 in 2020 (PCBS, 2021).

Bani Na'im: is a town in Hebron Governorate located seven km east of Hebron City in the southern part of the West Bank. It is bordered by Ar Rawa'in areas (Masaferet Bani Na'im) to the east, Sa'ir and Ash Shuyukh towns to the north, Hebron City to the west, and Yatta town to the south. Bani Na'im extends over a mountainous area east of Hebron Mountains at an elevation of 958 m above sea level. The mean annual rainfall in Bani Na'im town is 369 mm, the average annual temperature is 16° C, and the average annual humidity is 61%.(ARIJ, 2009c).

According to the Palestinian Central Bureau of Statistics (PCBS), the total population of Bani Na'im town was 26,405. (PCBS, 2021).

Beit Ula: is a town located 10 km northwest of Hebron city in the southern West Bank. The town is located to the north of Hebron Governorate and is bordered by Halhul to the east, Nuba to the north, the Green Line to the west, and Tarqumiya to the south. Beit Ula town is located at an elevation of 550 m above sea level, with a mean annual rainfall of 470 mm, average annual temperature of 18 °C and the average annual humidity of 60%. Beit Ula municipal area includes Beit Ula, Qila and Ras al Jora localities. (ARIJ, 2009d). According to the 2020 Palestinian Central Bureau of Statistics (PCBS) Census, the total population of Beit Ula in 2020 was 15,586 (PCBS, 2021).

Nuba: is a village in Hebron Governorate, located 12 km northwest Hebron city, in the south of the West Bank. The village is located within the southern Palestinian mountains, upon an east to west sloping plain. It is bordered by Halhul to the east, Kharas to the north, Beit Ula to the south and the Green Line to the west (ARIJ, 2009h). According to the 2020 Palestinian Central Bureau of Statistics (PCBS) Census, the total population of Nuba in 2020 was 6,037 (PCBS, 2021).

Kharas: is a town located within Hebron Governorate, 11 km north-west of Hebron city in the southern part of the West Bank. It is bordered by Halhul town to the east, Surif to the north, Nuba to the south and the Green Line to the west. Kharas town is located in the west of Halhul mountain region, at an elevation of 523 m above sea level. The mean annual rainfall in Kharas town is 481 mm; the average annual temperature is 17° C, and the average annual humidity is 60% (ARIJ, 2009g). According to the 2020 Palestinian Central Bureau of Statistics (PCBS) Census, the total population of Kharas in 2020 was 9,798 (PCBS, 2021).

Surif: is a town in Hebron Governorate located 18 km north of Hebron city in the southern part of the West Bank. Located between Hebron and Bethlehem Governorates, the town is bordered by Beit Ummar and Safa to the east, Al Jab'a to the north (Bethlehem Governorate), the 1949 Armistice Line (the Green Line) to the west, and Kharas to the south (ARIJ, 2009i).

According to the 2020 Palestinian Central Bureau of Statistics (PCBS) Census, the total population of Surif in 2020 was 18,534 (PCBS, 2021).

Beit Ummar: is a town in Hebron Governorate, located 10 km north of Hebron city in the southern part of the West Bank. The town is located on the Israeli bypass road (Route 60) between Hebron and Jerusalem and is considered the northern gateway of Hebron Governorate. Beit Fajjar village

and Al Arrub Camp border Beit Ummar to the east, Al Khader to the north (Bethlehem Governorate), Surif to the west and Halhul to the south.

Beit Ummar extends over a mountainous area north of the Hebron with an elevation of 943 m above sea level. Characterized by a moderate climate, the summer is hot and dry, whilst the winter sees a small amount of rainfall. The mean annual rainfall in Beit Ummar town is 565 mm, average annual temperature is 16 °C, and the average annual humidity is 61% (ARIJ, 2009e).

According to the 2020 Palestinian Central Bureau of Statistics (PCBS) Census, the total population of Beit Ummar in 2020 was 18,202 (PCBS, 2021).

Al-Arroub Camp: is a Palestinian refugee camp located in Hebron Governorate, approximately 11 kilometers north of Hebron city in the southern part of the West Bank. It is bordered by Beit Fajjar to the east, Al Khader (Bethlehem Governorate) and Etzion Israeli settlement to the north, Beit Ummar to the west and Sa'ir to the south (ARIJ, 2009a). In 2020, the total population of Al Arrub Refugee Camp was 9,586 (PCBS, 2021).

Appendix 9: Population distribution by grade, region, and gender

Region / Variable	Halhul		Al-Shuyukh		Sier		Bani Na'im		Al Aroub		Beit Ummar		Surif		Nuba		Kharas		Beit Ula		Total
Gender	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	M	F	
7th	349	239	173	173	316	335	283	285	0	0	214	230	233	0	92	87	103	112	196	0	**3420**
8th	315	220	163	176	303	305	276	305	0	0	187	204	190	0	73	82	93	120	166	0	**3178**
9th	303	237	136	141	247	293	227	293	0	0	160	194	197	0	89	74	85	99	147	0	**2922**
10th	294	313	98	147	244	297	215	287	113	129	195	195	121	192	67	97	105	105	142	175	**3531**
Total	1261	1009	570	637	1110	1230	1001	1170	113	129	756	823	741	192	321	340	386	436	651	175	**13051**
	2270		**1207**		**2340**		**2171**		**242**		**1579**		**933**		**661**		**822**		**826**		

Appendix 10:Population Distribution by Schools, region, and gender.

التشكيلات للطلاب من الصفوف 7-10 / شمال الخليل

الموقع	الرقم	المدرسة	المرحلة الأساسية العليا				المجموع
			السابع	الثامن	التاسع	العاشر: أكاديمي	العاشر: مهني	
حلحول	1	حلحول الثانوية للبنين				134		134
	2	الرشيد الاساسية للبنين	99	83	125			307
	3	صلاح الدين الاساسية للبنين	57	64	57	41		219
	4	محمود التوايهة الأساسية للبنين	32	27	28			87
	5	عمر التميمي الثانوية للبنين - ب	79	66	58	72	47	322
	6	القسطل الأساسية للبنين	39	33	35			107
	7	الإسراء الأساسية للبنين	43	42				85
الشيوخ	8	الشيوخ الثانوية للبنين		32	120	65	33	250
	9	الحاج عيسى المشني الاساسية للبنين	116	114				230
	10	الحاج علي اسعيفان الاساسية للبنين	38					38
	11	شيوخ العروب الأساسية المختلطة	19	17	16			52
سعير	12	سعير الثانوية للبنين				128		128
	13	العذيسة الاساسية للبنين	22	24	17	18		81
	26	اسماعيل الفروخ الاساسية للبنين	48	48	33	48		177
	27	صفد الأساسية للبنين	140	146	107			393
	28	الدوارة الاساسية للبنين	23	14	26	17		80
	29	وادي الريم الاساسية المختلطة	6	5				11
	30	حمزه بن عبد المطلب الاساسية للبنين	57	38	41	33		169
	31	كويزيبا الاساسية للبنين	20	28	23			71
العروب	41	العروب الثانوية للبنين				113		113
بني نعيم	42	بني نعيم الثانوية للبنين			70	215		285
	43	التقوى الاساسية للبنين	138	151	58			347
	44	موسى بن نصير الاساسية للبنين	83	76	81			240
	43	الكندي الاساسية للبنين	51	41	18			110
	45	بادية بني نعيم الاساسية المختلطة	11	8				19
بيت امر	46	بيت امر الثانوية للبنين				195		195
	47	بيت امر الاساسية للبنين	173	158	140			471
	48	صافا الاساسية للبنين	41	29	20			90
صوريف	52	عمرو بن العاص الاساسية للبنين	138	109	109			356
	53	بلال بن رباح الاساسية للبنين	30	36	29			95
	54	صوريف الثانوية للبنين				121		121
	55	شهداء صوريف الاساسية للبنين	53	39	51			143
	58	الدير الاساسية المختلطة	12	6	8			26
نوبا	61	نوبا الثانوية للبنين	92	73	89	67		321
خاراس	65	خاراس الثانوية للبنين			47	105		152
	66	شهداء خاراس الاساسية للبنين	75	65				140
	67	خالد بن الوليد الاساسية للبنين	28	28	38			94
بيت اولا	71	بيت اولا الثانوية للبنين				142		142
	72	بيت اولا الاساسية للبنين	77	64	66			207
	73	جابر بن حيان الاساسية للبنين	41	38	36			115
	74	بئر القوس الاساسية للبنين	40	28	21			89
	76	أبو القاسم الشابي الأساسية للبنين	38	36	24			98
		المجموع	1959	1766	1591	1514	80	6910
		عدد مدارس شمال الخليل:	106					
		عدد المدارس التي تحتوي على الفئة المستهدفة:	42					

التشكيلات للطالبات من الصفوف 7-10 / شمال الخليل

الموقع	الرقم	المدرسة	المرحلة الأساسية العليا				المجموع
			السابع	الثامن	التاسع	العاشر: أكاديمي	العاشر: مهني	
	1	الصفا الأساسية المختلطة	22					22
	2	القادسية الثانوية للبنات	51	82	96	145		374
	3	فلسطين الثانوية للبنات	34	30	24	50	16	154
	4	شهداء حلحول الأساسية للبنات	57	49	52	72		230
	5	المعتصم الاساسية للبنات	27	23	20			70
	6	الوفاق الثانوية للبنات	35	23	35	30		123
	7	الصخرة المشرفة الأساسية المختلطة	13	13	10			36
	8	دلال المغربي الاساسية للبنات	82	89	86			257
	9	ياسر عرفات الأساسية المختلطة	10	14				24
	10	الشفا الأساسية المختلطة	17	24				41
	11	شيوخ العروب الأساسية المختلطة	19	18	16			53
	12	الشهيد يزن الثانوية للبنات				147		147
	13	مصعب بن عمير الأساسية للبنات	45	31	39			115
سعير	14	وادي الريم الاساسية المختلطة	7	5	3	4		19
	15	سعير الثانوية للبنات				197		197
	16	سعير الأساسية للبنات	99	102	98			299
	17	ماريا القبطية الأساسية للبنات	57	46	48			151
	18	صفية الاساسية للبنات	65	57	49			171
	19	الدوارة الثانوية للبنات	21	24	23	33		101
	20	العذيسة الأساسية للبنات	22	17	21	23		83
	21	عمر بن عبد العزيز الثانوية للبنات	34	30	32	23		119
	22	الكرامة الأساسية للبنات	30	24	19	17		90
العروب	23	العروب الثانوية للبنات				129		129
	24	بني نعيم الثانوية للبنات				84		84
	25	بني نعيم الأساسية للبنات	110	111	106	108		435
	26	الصحابة الأساسية للبنات	68	75	91	95		329
	27	شهداء بني نعيم الأساسية للبنات	81	94	96			271
	28	ياقين الأساسية المختلطة	26	25				51
بيت امر	29	بيت امر الثانوية للبنات				129		129
	30	بيت امر الأساسية للبنات	85	80	72			237
	31	زهرة المدائن الأساسية للبنات	51	48	48	55		202
	32	عسقلان الأساسية للبنات	73	56	53			182
	33	صافا الأساسية للبنات	21	20	21	11		73
صوريف	34	صوريف الثانوية للبنات				108		108
	35	الفاروق الثانوية للبنات				61	23	84
نوبا	36	نوبا الثانوية للبنات				97		97
نوبا	37	الهدى الأساسية للبنات	73	68	74			215
	38	حنا الأساسية المختلطة	14	14				28
خاراس	39	خاراس الثانوية للبنات			66	83	22	171
	40	خاراس الأساسية للبنات	69	65				134
	41	الخنساء الأساسية للبنات	43	55	33			131
بيت أولا	42	بيت اولا الثانوية للبنات				175		175
		المجموع	1461	1412	1331	1876	61	6141
		عدد مدارس شمال الخليل:	106					
		عدد المدارس التي تحتوي على الفئة المستهدفة:	42					

Appendix 11: Research Facilitation Letter

بسم الله الرحمن الرحيم

State of Palestine
Ministry of Education
Center for Educational Research and Development

دولة فلسطين
وزارة التربية والتعليم
مركز البحث والتطوير التربوي

الرقم: و ت /١٣/١/٢٠٢١
التاريخ: 3 / 5 /2021م

لمن يهمّه الأمر

"تسهيل مهمّة بحثية"

يهديكم مركز البحث والتطوير التربوي أطيب تحية، ويرجو منكم التكرم بتسهيل مهمة الباحثة:

"إيمان البربراوي"

من جامعة **القدس** للحصول على المعلومات اللازمة لإعداد دراستها بعنوان:

"Knowledge, Attitudes and Preventive Behaviors Toward COVID-19 Among 7th-10th Graders: A Cross-Sectional Study in North Hebron"

ملاحظات:

- تتضمن الدراسة تطبيق استبيان على عينة من طلبة الصفوف السابع وحتى العاشر في مدارس شمال الخليل.
- ت/يتولى الباحث/ة أنشطة جمع البيانات، بتنسيق مع "منسق البحث والتطوير والجودة" في المديرية.
- الاستجابة على الأدوات البحثية من قبل عينة المبحوثين طوعية.
- نظراً لظروف الجائحة يتم تطبيق أدوات البحث عبر النماذج المحوسبة دون تواصل وجاهي مع المبحوثين.

مع الاحترام،،

د. محمد مطر

/مدير مركز البحث والتطوير التربوي

نسخة:
عطوفة وكيل الوزارة المحترم.
عطوفة الوكلاء المساعدين المحترمين.
الأخ مدير عام التربية والتعليم / شمال الخليل المحترم.
د. **مها الحسيني** المشرف على الدراسة/ المحترم -بريد الكتروني mhusseini@staff.alquds.edu

Tel (+ 970-562-501092) E-mail (ncerd@moe.edu.ps)

Appendix 12: The ethical approval

Al-Quds University
Jerusalem
School of Public Health

جامعة القدس
القدس
كلية الصحة العامة

التاريخ:2021/2/16
المرجع.

عزيزتي الطالبة ايمان بربراوي المحترمة
برنامج: الصحة العامة

الموضوع: موافقة لجنة اخلاقيات البحث العلمي

قامت اللجنة الفرعية لأخلاقيات البحث التابعة لكلية الصحة العامة بمراجعة مشروع الرسالة

بعنوان:

(Health Belief Model and COVID-19; Knowledge, Attitude and Prevention of Primary School Students in North Hebron: A Cross-Sectional Study).

المقدم من (مشرف الرسالة/ د.مها النوباني). يعتبر مشروعك مستوفيًا لمتطلبات أخلاقيات البحث في جامعة القدس.

نتمنى لكم كل التوفيق في تسيير المشروع.

لجنة اخلاقيات البحث
كلية الصحة العامة
Faculty of Public Health

د. اسمى الامام

نسخة/ أعضاء لجنة البحث
نسخة/ الملف

Jerusalem Branch/Telefax 02-2799234
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P.O. box 51000 Jerusalem

فرع القدس / تلفاكس 02-2799234
فرع غزة / تلفاكس 08-264420-2644210
ص.ب. 51000 القدس

Appendix 13: Names of experts who evaluated the study instrument

No.	Name	Position	Field of expert
1.	Dr. Asma Al Imam	Dean of the college of Public Health and Head of mentoring committee, Al-Quds University	Public health and community studies, health policy and management
2.	Dr. Najah Al-Khatib	Assistant professor, coordinator of community mental health program at Al-Quds University	Public health and mental health
3.	Dr. Muna Ahmead	Assistant professor at the Faculty of Public Health, Al-Quds University	Public health and mental health
4.	Dr. Salam Al-Khatib	Director of Nursing Department, Al-Quds University	Mental health and research
5.	Ms. Hakima Zaarir	Head of School-Health Department, North Hebron Directorate.	Public health and mental health
6.	Ala'a Zareer	Statistical analyst	Statistics and research

Appendix 14: Questionnaire

جامعة القدس
عمادة الدراسات العليا
كلية الصحة العامة

حضرة الطالب/ة المحترم/ة.

تحية طيبة وبعد...

تجري الباحثة دراسة بعنوان "**المعرفة والمواقف والسلوكيات الوقائية تجاه فيروس كورونا بين طلبة الصفوف السابع حتى العاشر: دراسة مقطعية في منطقة شمال الخليل**"، وذلك استكمالاً لمتطلبات الحصول على درجة الماجستير في تخصص الصحة العامة، ومن أجل تحقيق أهداف الدراسة قامت الباحثة بتطوير استبانة لقياس مدى المعرفة والمواقف والسلوكيات لدى الفئة المستهدفة وعلاقتها بالوقاية من فيروس كورونا، ويطيب لي أن أضع بين أيديكم هذه الاستبانة آملة منكم التكرم بتعبئتها بكل دقة وموضوعية، لما لذلك من عظيم الأثر في إنجاح هذه الدراسة، علماً أن إجاباتكم ستكون سرية، ولا تشكل أي نوع من الاختبار، ولن تستخدم إلا لأغراض البحث العلمي فقط.

مع فائق الاحترام

الباحثة: إيمان البربراوي

إشراف: د. مها النوباني

الجزء الأول

البيانات الاجتماعية والديموغرافية:

1.1 الجنس: ☐ ذكر ☐ أنثى

1.2 العمر: ..... سنة.

1.3 الصف: ☐ 7 ☐ 8 ☐ 9 ☐ 10

1.4 مكان الإقامة: ☐ مدينة ☐ قرية ☐ مخيم

1.5 مستوى تعليم الوالدين:

أ) مستوى تعليم الأب: ☐ الثانوية العامة فأقل ☐ دبلوم متوسط ☐ درجة بكالوريوس
☐ دراسات عليا (دبلوم عالي،ماجستير، دكتوراه، ...) ☐ آخر، اذكر.....

ب) مستوى تعليم الأم: ☐ الثانوية العامة فأقل ☐ دبلوم متوسط ☐ درجة بكالوريوس
☐ دراسات عليا (دبلوم عالي، ماجستير، دكتوراه، ...) ☐ آخر، اذكر.....

1.6 يعمل الوالدان في مهن صحية: ☐ أحدهما ☐ كلاهما ☐ لا أحد منهما.

1.7 ترتيبي في الأسرة هو: ☐ الأول ☐ الثاني ☐ الثالث ☐ الرابع ☐أخرى (حدد .....)

1.8 كم عدد الأخوة والأخوات لديك؟ .....

1.9 كم عدد الأشخاص الذين يسكنون في منزلك بشكل دائم بما فيهم أنت؟ ..... اشخاص.

1.10 كم عدد الغرف الموجودة في منزلك (باستثناء المطبخ والحمام)؟ ..... غرف.

تقييم الوضع الصحي:

هذه المجموعة من الأسئلة عن تقييمك لوضعك الصحي، يرجى اختيار الإجابة المناسبة لكل سؤال:

1.11 كيف تقيم وضعك الصحي الحالي؟

☐ جيد جدا ☐ جيد ☐ مقبول ☐ سيء ☐ سيئ جدا

1.12 هل تلقيت أي استشارة طبية في الشهر الماضي؟

☐ نعم ☐ لا

1.13 هل ظهرت عليك أي أعراض تنفسية (سعال، ضيق في التنفس، سيلان الأنف) خلال الـ 14 يومًا الماضية؟

☐ نعم ☐ لا ☐ لا أتذكر

1.14 هل سافرت خارج فلسطين خلال الشهر الماضي؟

☐ نعم ☐ لا ☐ لا أتذكر

1.15 هل أجريت فحص كورونا من قبل؟

☐ نعم، أكمل إلى السؤال 16 ☐ لا، انتقل الى السؤال 17

1.16 ماذا كانت النتيجة؟

☐ إيجابي ☐ سلبي

1.17 هل تعرف أشخاصًا أصيبوا بفيروس كورونا (فرد من العائلة أو صديق أو جار)؟

☐ نعم ☐ لا

1.18 هل لديك أي مرض مزمن؟ (سكري، قلب، ربو، ....)

☐ نعم (اذكر: .....). ☐ لا ☐ لا أستطيع أن أقرر

المتغيرات المعرفية والممارسات والتوجهات:

هذه المجموعة من الأسئلة حول المتغيرات المعرفية والممارسات والتوجهات الخاصة بفيروس كورونا، يرجى اختيار الإجابة المناسبة لكل سؤال:

- **التوجهات:**

1.19 هل تعتقد أن فيروس كورونا موجود؟

☐ نعم ☐ لا

1.20 هل تعتقد أنه يمكن الوقاية من فيروس كورونا؟

☐ نعم ☐ لا

- **الممارسات:**

1.21 هل ترتدي كمامة قبل مغادرة المنزل؟

☐ دائما ☐ بعض الأحيان ☐ أبدا

1.22 هل تقوم بغسل اليدين بالصابون فور دخول المنزل وقبل لمس أي شيء؟

☐ دائما ☐ بعض الأحيان ☐ أبدا

1.23 إلى أي مدى غيّر فيروس كورونا في عاداتك اليومية؟

☐ كثيراً ☐ متوسط ☐ قليلا ☐ لم يغير مطلقاً

1.24 هل قمت بتغيير أي من خططك بسبب فيروس كورونا؟

☐ نعم ☐ لا

- **المعرفة:**

1.25 العبارات التالية صحيحة أم خاطئة؟ / ضع إشارة صح او خطأ

- الأعراض الرئيسية لفيروس كورونا هي الحمى والتعب والسعال الجاف (_____).
- ينتقل فيروس كورونا بشكل رئيسي عن طريق الرذاذ وقطرات الأنف من المريض المصاب بفيروس كورونا. (_____)
- انسداد الأنف وسيلان الأنف والعطس أعراض أقل شيوعًا لدى الأشخاص المصابين بفيروس كورونا (_____).
- لا يصاب جميع الأشخاص المصابين بفيروس كورونا بمضاعفات خطيرة. (_____).
- الأشخاص المسنون المصابون بأمراض مزمنة هم أكثر عرضة للمضاعفات الشديدة (_____).
- قد تؤدي المصافحة ولمس أدوات شخص مصاب إلى الإصابة بفيروس كورونا (_____).
- لا ينقل الفيروس من الأشخاص المصابون بفيروس كورونا للآخرين في حالة عدم وجود حمى (_____).

1.26 تشمل السلوكيات الوقائية من فيروس كورونا ما يلي: **(اختر واحدًا أو أكثر)**

☐ عدم مصافحة الآخرين أو تقبيلهم.
☐ لا تشرب الماء.
☐ تباعد اجتماعي لا يقل عن 1 متر.
☐ غسل اليدين بالصابون فور دخول المنزل وقبل لمس أي شيء.
☐ تناول الوجبات السريعة.
☐ عدم لمس العينين والأنف والفم باليدين.
☐ شرب المشروبات الغازية.
☐ غسل اليدين بانتظام بالماء والصابون لمدة 20 ثانية على الأقل.
☐ الذهاب إلى الحفلات والتجمعات.
☐ لبس الكمامة.

1.27 ما هي مصادر المعلومات الخاصة بك بخصوص فيروس كورونا والوقاية منه؟ **الرجاء اختيار أهم 3 مصادر**.

☐ وزارة الصحة الفلسطينية ☐ الطبيب ☐ الممرضة ☐ أولياء الأمور
☐ الأصدقاء ☐ المدرسة / المعلمين ☐ وسائل التواصل الاجتماعي ☐ التلفزيون
☐ الراديو ☐ الإنترنت ☐ منشورات منظمة الصحة العالمية ☐ أخرى، اذكر.....

الجزء الثاني

الأسئلة التالية مبينة على المعتقدات الصحية، الرجاء اختيار أحد الخيارات الخمسة للإجابة كما يناسب مستوى موافقتك بوضع علامة (X) في المكان المناسب.

الفقـــرة	موافق بشدة (1)	موافق (2)	محايد (3)	غير موافق (4)	غير موافق بشدة (5)
إدراك الكفاءة الذاتية – Perceived Self-efficacy: تصور الفرد لكفاءته لأداء السلوك الصحي بنجاح					
2.1 الحفاظ على صحة جيدة هو جزء مهم من حياتي.					
2.2 أعتقد أنني شخص يهتم جيدًا بتصرفاته الصحية.					
2.3 أعتقد أنه من المهم بالنسبة لي التمتع بصحة عامة جيدة.					
2.4 أعتقد أنه من المهم بالنسبة لي تجنب الأمراض المعدية.					
2.5 أعتقد أنني شخص يتخذ الإجراءات الصحية الصحيحة.					
2.6 لدي القدرة على اتباع كل التعليمات الوقائية ضد المرض.					
إدراك القابلية للإصابة - Perceived Susceptibility: تقييم الفرد لإمكانية الإصابة بفيروس كورونا					
2.7 من المحتمل أن يصاب أحد معارفي بكورونا.					
2.8 أنا أكثر عرضة للإصابة بفيروس كورونا.					
2.9 لا أهتم بفيروس كورونا وأقوم بنشاطاتي اليومية مثل السابق.					
إدراك الخطورة- Perceived Severity: تقييم الفرد لخطورة الوضع وآثاره المحتملة					
2.10 إذا أصبت بعدوى كورونا فالوضع خطير.					
2.11 إذا أصبت بعدوى كورونا، قد أفقد حياتي.					
2.12 إذا أصبت بعدوى كورونا، سوف تتأثر حياتي اليومية.					
2.13 يوجد أشخاص كثيرون يموتون بسبب هذا الفيروس.					
2.14 هذا المرض ليس خطيرا جدا.					
2.15 شدة انتقال هذا المرض عالية.					
فوائد نظافة اليدين- Benefits of Hand Hygiene: تقييم الفرد للنتائج الإيجابية لتبني سلوك النظافة الشخصية					
2.16 نظافة اليدين ستحميني تمامًا من كورونا.					
2.17 أشعر بالأمان من العدوى بكورونا عن طريق تنظيف اليدين.					
2.18 يمكن الوقاية من فيروس كورونا بسهولة عن طريق غسل اليدين بانتظام بالماء والصابون.					
2.19 يمكن الوقاية من فيروس كورونا بسهولة عن طريق معدات الحماية الشخصية مثل الكمامات والقفازات التي تستخدم لمرة واحدة.					
معيقات نظافة اليدين- Barriers for Hand Hygiene: تقييم الفرد للتأثيرات التي تمنع تبني سلوك النظافة الشخصية					
2.20 تضررت يداي أثناء تنظيف اليدين من الصابون ومعقم اليدين.					
2.21 دائما أنسى تنظيف يداي.					
2.22 اجد صعوبة باتباع التعليمات للوقاية من فيروس كورونا هذا المرض.					

2.23 لا أتحلى بالصبر لاتباع التعليمات الوقائية.					
2.24 من الصعب غسل اليدين بانتظام بالماء والصابون.					
2.25 الكمامة نادرة في البيت وبالتالي لا أرتديها.					
2.26 معقمات اليدين نادرة ومكلفة في السوق.					
2.27 من الصعب عدم لمس الفم والأنف والعينين.					
فوائد التباعد الاجتماعي- Benefits of Social Distancing: تقييم الفرد للنتائج الإيجابية لتبني سلوك التباعد الاجتماعي					
2.28 التباعد الاجتماعي يحمي من الإصابة بفيروس كورونا.					
2.29 اشعر بالأمان من العدوى عن طريق تطبيق التباعد الاجتماعي.					
معيقات التباعد الاجتماعي- Barriers for Social Distancing: تقييم الفرد للتأثيرات التي تمنع تبني سلوك التباعد الاجتماعي					
2.30 من الصعب البقاء في المنزل للوقاية من فيروس كورونا.					
2.31 أشعر بالسوء عند تطبيق التباعد الاجتماعي					
2.32 أنسى دائمًا تطبيق التباعد الاجتماعي					
2.33 التباعد الاجتماعي أثر بشكل كبير على علاقاتي الاجتماعية مع اصدقائي					
2.34 التباعد الاجتماعي أثر على علاقاتي مع اقربائي					
الاشارات للعمل- Cues to action: التأثيرات الخارجية التي تعزز السلوك الصحي المطلوب.					
2.35 معلومات التلفزيون والراديو والإنترنت حول المرض مفيدة.					
2.36 شجعتني الحكومة على اتباع السلوك الصحي للوقاية من فيروس كورونا					
2.37 شجعني أفراد الأسرة على اتباع السلوك الصحيح للوقاية من فيروس كورونا.					
2.38 أرشدني المرشد التربوي/ الصحي على اتباع السلوك الصحيح للوقاية من فيروس كورونا.					
2.39 شجعني المعلمون على اتباع السلوك الصحيح للوقاية من فيروس كورونا.					
2.40 قامت المدرسة بنشر التعليمات الخاصة بالوقاية من فيروس كورونا.					
القدرة على تنفيذ السلوكيات الوقائية (الإجراءات الفعلية) - Ability for preventive behaviors (actual actions)					
2.41 أرتدي كمامة قبل مغادرة المنزل.					
2.42 احتفظ بمسافة آمنة مع الآخرين (متر واحد على الأقل)					
2.43 أغسل يدي بالصابون فور دخول المنزل.					
2.44 لا أصافح الآخرين.					
2.45 لا أشارك الكمامة والكوب والصحن مع الآخرين.					

انتهى

مع خالص شكري لحسن تعاونكم

Appendix 15: Student's consent form

جامعة القدس
عمادة الدراسات العليا
كلية الصحة العامة

نموذج موافقة ولي أمر على مشاركة ابنه/ابنته في بحث علمي

حضرة ولي أمر الطالب/ة المحترم/ة.

تحية طيبة وبعد...

انا الطالبة إيمان البربراوي من جامعة القدس، ماجستير صحة عامة. أقوم بعمل دراسة بعنوان " **المعرفة والمواقف والسلوكيات الوقائية تجاه فيروس كورونا بين طلبة الصفوف السابع حتى العاشر: دراسة مقطعية في منطقة شمال الخليل**"، وذلك استكمالاً لمتطلبات الحصول على درجة الماجستير في تخصص الصحة العامة، ومن أجل تحقيق أهداف الدراسة قامت الباحثة بتطوير استبانة لقياس مدى المعرفة والمواقف والسلوكيات لدى الفئة المستهدفة وعلاقتها بالوقاية من فيروس كورونا، علما بأن المشاركة هي أمر طوعي ويتطلب ذلك موافقة ولي أمر الطالب/ة. علماً أن الاجابات ستكون سرية، ولا تشكل أي نوع من الاختبار، ولن تستخدم إلا لأغراض البحث العلمي فقط.

وعليه فإن كنت موافقاً على إشراك ابنك/ابنتك في هذه الدراسة، يرجى منك تعبئة النموذج التالي:

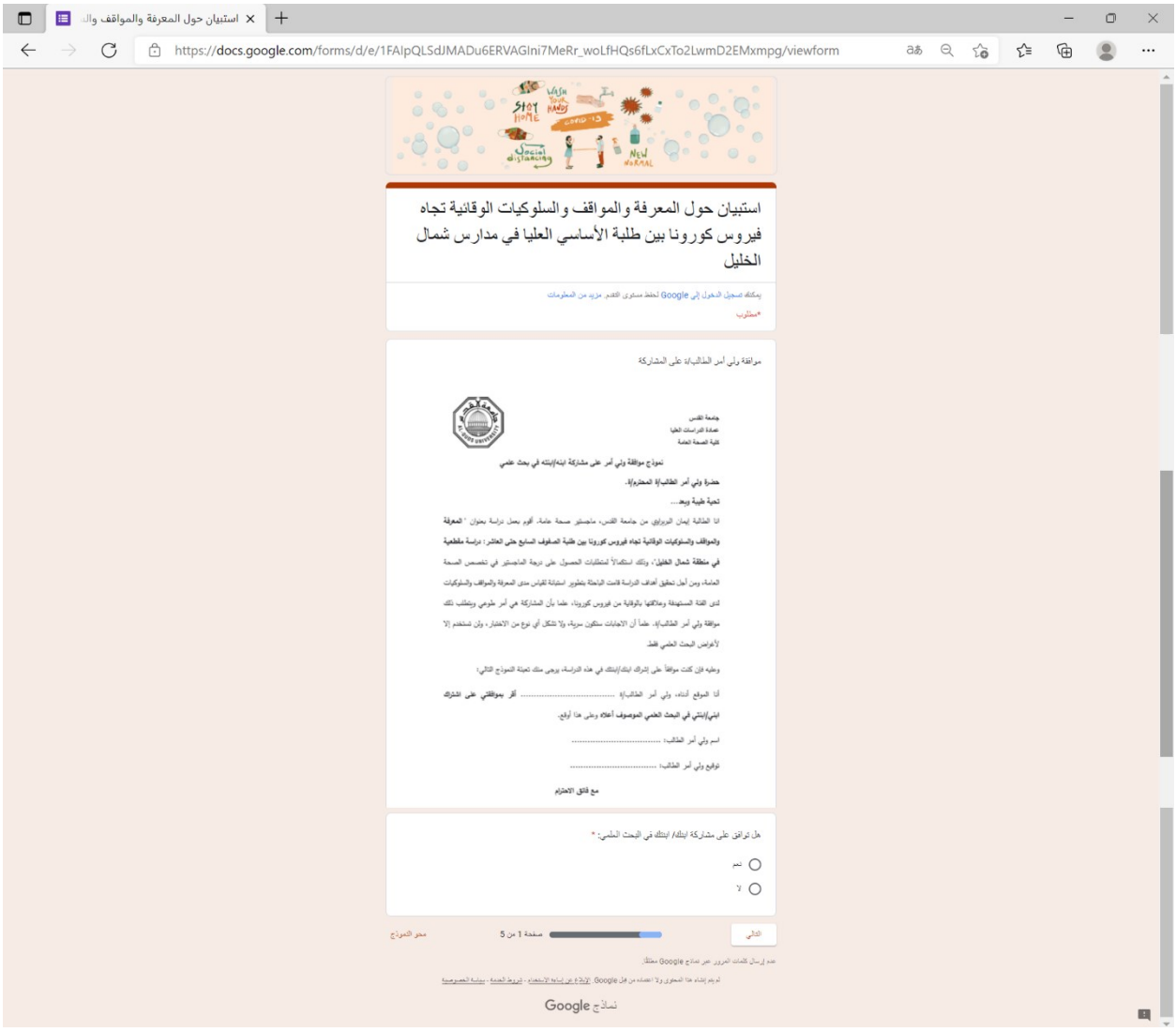
أنا الموقع أدناه، ولي أمر الطالب/ة ..... **أقر بموافقتي على اشتراك ابني/ابنتي في البحث العلمي الموصوف أعلاه** وعلى هذا أوقع.

اسم ولي أمر الطالب: .....

توقيع ولي أمر الطالب: .....

مع فائق الاحترام

Appendix 16: online approval



Appendix 17:Sociodemographic characteristics in details

Variable		Count (Frequency)	Percentage (%)
Gender	Male	122	36.9%
	Female	209	63.1%
Age	≤ 13 years	113	34.1%
	14 years	95	28.7%
	15 years	75	22.7%
	≥ 16 years	48	14.5%
Grade	Seventh	59	17.8%
	Eighth	120	36.3%
	Nineth	64	19.3%
	Tenth	88	26.6%
Residence	City	88	26.5%
	Village/ Town	166	50.2%
	Camp	77	23.3%
Father's level of education	High school or less	148	44.7%
	Diploma	46	14.0%
	Bachelor's	68	20.5%
	Higher Education	18	5.4%
	Other	51	15.4%
Mother's level of education	High school or less	114	34.4%
	Diploma	51	15.4%
	Bachelor's	97	29.3%
	Higher Education	25	7.6%
	Other	44	13.3%
Parents work in healthcare professions	One parent	52	15.7%
	Both parents	19	5.7%
	None	260	78.6%
Birth order	First	85	25.7%
	Second	58	17.5%

Variable		Count (Frequency)	Percentage (%)
	Third	56	16.9%
	Fourth	43	13.0%
	Other	89	26.9%
Number of siblings	≤ 3	84	25.4%
	4	71	21.5%
	5	75	22.6%
	≥ 6	101	30.5%
Number of people constantly are living in the household	≤ 5 persons	66	19.9%
	6 persons	72	21.8%
	7 persons	85	25.7%
	8 persons	69	20.8%
	≥ 9 persons	39	11.8%
Number of rooms	≤ 3 rooms	71	21.5%
	4 rooms	79	23.8%
	5 rooms	91	27.5%
	≥ 6 rooms	90	27.2%

Appendix 18:Frequencies and percentages of (7^{th}-10^{th}) graders in the North Hebron Directorate Education assessment of their health status towards the COVID-19.

Question	Grade	Freq.	Answer				Mean	SD	F-test	P-value
		%	Very good	Good	Acceptable	Very bad				
How do you assess your current health status?	7	F	46	12	1	0	4.76	0.468	2.951	0.033
		%	13.9	3.6	0.3	0.0				
	8	F	98	18	3	1	4.77	0.576		
		%	29.6	5.4	0.9	0.3				
	9	F	44	15	5	0	4.61	0.633		
		%	13.3	4.5	1.5	0.0				
	10	F	60	18	8	2	4.52	0.844		
		%	18.1	5.4	2.4	0.6				
Total		**F**	**248**	**63**	**17**	**3**	**4.67**	**0.659**		
		%	**74.9**	**19.0**	**5.1**	**0.9**				

Question	Grade	Freq.	Answer		Mean	SD	F-test	P-value
		%	Yes	No				
Have you got any medical consultation in the past month?	7	F	9	50	1.15	0.363	0.735	0.532
		%	2.7	15.1				
	8	F	17	103	1.14	0.350		
		%	5.1	31.1				
	9	F	10	54	1.16	0.366		
		%	3.0	16.3				
	10	F	19	69	1.22	0.414		
		%	5.7	20.8				
Total		**F**	**55**	**276**	**1.17**	**0.373**		
		%	**16.6**	**83.4**				

Question	Grade	Freq.	Answer			Mean	SD	F-test	P-value
		%	Yes	No	I don't remember				
Did you have any respiratory symptoms (cough, shortness of breath, runny nose) in the last 14 days?	7	F	5	48	6	0.98	0.435	2.633	0.050
		%	1.5	14.5	1.8				
	8	F	21	93	6	1.13	0.459		
		%	6.3	28.1	1.8				
	9	F	10	48	6	1.06	0.500		
		%	3.0	14.5	1.8				
	10	F	8	68	12	0.95	0.477		
		%	2.4	20.5	3.6				
Total		**F**	**44**	**257**	**30**	**1.04**	**0.472**		

Question	Grade	Freq.	Answer			Mean	SD	F-test	P-value
		%	13.3	77.6	9.1				

Question	Grade	Freq.	Answer		Mean	SD	F-test	P-value
		%	Yes	No				
Have you traveled outside Palestine during the past month?	7	F	4	55	1.07	0.254	0.853	0.466
		%	1.2	16.6				
	8	F	9	111	1.08	0.264		
		%	2.7	33.5				
	9	F	2	62	1.03	0.175		
		%	0.6	18.7				
	10	F	3	85	1.03	0.183		
		%	0.9	25.7				
Total		**F**	**18**	**313**	**1.05**	**0.227**		
		%	**5.4**	**94.6**				

Question	Grade	Freq.	Answer		Mean	SD	F-test	P-value
		%	Yes	No				
Have you done a PCR test for COVID-19 before?	7	F	5	54	1.08	0.281	2.678	0.047
		%	1.5	16.3				
	8	F	29	91	1.24	0.430		
		%	8.8	27.5				
	9	F	12	52	1.19	0.393		
		%	3.6	15.7				
	10	F	23	65	1.26	0.442		
		%	6.9	19.6				
Total		**F**	**69**	**262**	**1.21**	**0.407**		
		%	**20.8**	**79.2**				

Question	Grade	Freq.	Answer		Mean	SD	F-test	P-value
		%	Negative	Positive				
What was the result?	7	F	1	7	1.88	0.354	0.900	0.445
		%	1.2	8.5				
	8	F	10	23	1.70	0.467		
		%	12.2	28.0				
	9	F	6	7	1.54	0.519		
		%	7.3	8.5				
	10	F	10	18	1.64	0.488		
		%	12.2	22.0				
Total		**F**	**27**	**55**	**1.67**	**0.473**		
249missing values		**%**	**32.9**	**67.1**				

Question	Grade	Freq.	Answer	Mean	SD	F-test	P-value

Question	Grade	Freq.	Answer		Mean	SD	F-test	P-value
		%	Yes	No				
Do you know people infected with COVID-19 (family member, friend,…)?	7	F	34	25	1.58	0.498	3.169	0.025
		%	10.3	7.6				
	8	F	82	38	1.68	0.467		
		%	24.8	11.5				
	9	F	43	21	1.67	0.473		
		%	13.0	6.3				
	10	F	71	17	1.81	0.397		
		%	5.1	21.5				
Total		F	**230**	**101**	**1.69**	**0.461**		
		%	**69.5**	**30.5**				

Question	Grade	Freq.	Answer			Mean	SD	F-test	P-value
		%	Yes	No	I can't decide				
Do you have any chronic disease?	7	F	1	54	4	0.95	0.289	2.958	0.033
		%	0.3	16.3	1.2				
	8	F	8	110	2	1.05	0.286		
		%	2.4	33.2	36.3				
	9	F	0	59	5	1.92	0.270		
		%	0.0	17.8	1.5				
	10	F	5	75	8	0.97	0.385		
		%	1.5	22.7	2.4				
Total		**F**	**14**	**298**	**19**	**0.98**	**0.316**		
		%	**4.2**	**90.0**	**5.7**				

N= 331

Appendix 19: Frequencies and percentages of the seventh to tenth grades students in North Hebron Directorate of Education attitudes towards the COVID-19.

Question	Grade	Freq. %	Answer Yes	Answer No	Total	Mean	SD	F-test	P-value
Do you believe that COVID-19 exist?	7	F	49	10	59	1.66	0.757		
		%	14.8	3.0	17.8				
	8	F	94	26	120	1.57	0.827		
		%	28.4	7.9	36.3				
	9	F	50	14	64	1.56	0.833	0.231	0.875
		%	15.1	4.2	19.3				
	10	F	71	17	88	1.61	0.794		
		%	21.5	5.1	26.6				
Total		**F**	**264**	**67**	**331**	**1.04**	**0.472**		
		%	**79.8**	**20.2**	**100.0**				

Question	Grade	Freq. %	Answer Yes	Answer No	Total	Mean	SD	F-test	P-value
Do you think the corona virus can be prevented?	7	F	56	3	59	1.90	0.443		
		%	16.9	0.9	17.8				
	8	F	105	15	120	1.75	0.664		
		%	31.7	4.5	36.3				
	9	F	56	8	64	1.75	0.667	0.851	0.467
		%	16.9	2.4	19.3				
	10	F	78	10	88	1.77	0.638		
		%	23.6	3.0	26.6				
Total		**F**	**295**	**36**	**331**	**1.78**	**0.624**		
		%	**89.1**	**10.9**	**100.0**				

N= 331

Appendix 20: *Frequencies and percentages of (7th-10th) graders in the North Hebron Directorate of Education behaviors towards the COVID-19.*

Question	Grade	Freq.	Answer			Mean	SD	F-test	P-value
		%	Always	Sometimes	Never				
Do you wear a mask before leaving home?	7	F	16	39	4	2.20	0.550	1.973	0.118
		%	4.8	11.8	1.2				
	8	F	20	86	14	2.05	0.532		
		%	6.0	26.0	4.2				
	9	F	19	39	6	2.20	0.596		
		%	5.7	11.8	1.8				
	10	F	24	58	6	2.20	0.550		
		%	7.3	17.5	1.8				
Total		**F**	**79**	**222**	**30**	**2.15**	**0.555**		
		%	**23.9**	**67.1**	**9.1**				

Question	Grade	Freq.	Answer			Mean	SD	F-test	P-value
		%	Always	Sometimes	Never				
Do you wash your hands with soap immediately after entering home and before touching anything?	7	F	32	24	3	2.49	0.598	0.328	0.805
		%	9.7	7.3	0.9				
	8	F	70	46	4	2.55	0.563		
		%	21.1	13.9	1.2				
	9	F	37	27	0	2.58	0.498		
		%	11.2	8.2	0.0				
	10	F	48	37	3	2.51	0.567		
		%	14.5	11.2	0.9				
Total		**F**	**187**	**134**	**10**	**2.53**	**0.557**		
		%	**56.5**	**40.5**	**3.0**				

Question	Grade	Freq.	Answer				Mean	SD	F-test	P-value
		%	A lot	Some	A little	Not at all				
How much does the Coronavirus changed your daily routine?	7	F	10	22	16	11	2.47	0.989	1.883	0.132
		%	3.0	6.6	4.8	3.3				
	8	F	32	47	22	19	2.23	1.019		
		%	9.7	14.2	6.6	5.7				
	9	F	13	26	14	11	2.36	0.998		
		%	3.9	7.9	4.2	3.3				
	10	F	32	31	10	15	2.09	1.079		
		%	9.7	9.4	3.0	4.5				
Total		**F**	**87**	**126**	**62**	**56**	**2.26**	**1.030**		
		%	**26.3**	**38.1**	**18.7**	**16.9**				

Question	Grade	Freq.	Answer			Mean	SD	F-test	P-value
		%	Always	Sometimes	Never				

Question	Grade	Freq.	Answer		Mean	SD	F-test	P-value
		%	Yes	No				
Changing any plans that you have made due to the Coronavirus?	7	F	30	29	1.51	0.504	0.781	0.125
		%	9.1	8.8				
	8	F	68	52	1.57	0.498		
		%	20.5	15.7				
	9	F	29	35	1.45	0.502		
		%	8.8	10.6				
	10	F	56	32	1.64	0.484		
		%	16.9	9.7				
Total		**F**	**183**	**148**	**1.55**	**0.498**		
		%	**55.3**	**44.7**				

N=331

Appendix 21: Frequencies and Percentages of (7^{th}-10^{th}) graders knowledge towards the COVID-19 in North Hebron Directorate of Education Schools.

Question	Grade	Freq.	Answer		Mean	SD	F-test	P-value
		%	True	False				
The main clinical symptoms of COVID-19 are fever, fatigue, and dry cough	7	F	53	6	1.90	0.305	1.386	0.247
		%	16.0	1.8				
	8	F	107	13	1.89	0.312		
		%	32.3	3.9				
	9	F	53	11	1.83	0.380		
		%	16.0	3.3				
	10	F	82	6	1.93	0.254		
		%	24.8	1.8				
Total		**F**	**295**	**36**	**1.89**	**0.312**		
		%	**89.1**	**10.9**				
COVID-19 transmitted mainly through droplets and nose drops from an infected person with the virus.	7	F	48	11	1.81	0.393	1.282	0.280
		%	14.5	3.3				
	8	F	100	20	1.83	0.374		
		%	30.2	6.0				
	9	F	47	17	1.73	0.445		
		%	14.2	5.1				
	10	F	75	13	1.85	0.357		
		%	22.7	3.9				
Total		**F**	**270**	**61**	**1.82**	**0.388**		
		%	**81.6**	**18.4**				
Stuffy nose, runny nose, and sneezing are less common in persons infected with COVID-19.	7	F	31	28	1.53	0.504	1.447	0.229
		%	9.4	8.5				
	8	F	77	43	1.64	0.482		
		%	23.3	13.0				
	9	F	32	32	1.50	0.504		
		%	9.7	9.7				
	10	F	49	39	1.56	0.500		
		%	14.8	11.8				
Total		**F**	**189**	**142**	**1.57**	**0.496**		
		%	**57.1**	**42.9**				
Not all persons with COVID-19 will develop severe complications.	7	F	37	22	1.63	0.488	0.553	0.646
		%	11.2	6.6				
	8	F	79	41	1.66	0.476		
		%	23.9	12.4				
	9	F	45	19	1.70	0.460		
		%	13.6	5.7				
	10	F	63	25	1.72	0.454		
		%	19.0	7.6				
Total		F	**224**	**107**	**1.68**	**0.468**		
		%	**67.7**	**32.3**				

Question	Grade	Freq.	Answer		Mean	SD	F-test	P-value
		%	True	False				
Those who are elderly and have chronic diseases are more likely to be severe cases	7	F	55	4	1.93	0.254	0.612	0.607
		%	16.6	1.2				
	8	F	109	11	1.91	0.290		
		%	32.9	3.3				
	9	F	56	8	1.88	0.333		
		%	16.9	2.4				
	10	F	82	6	1.93	0.254		
		%	24.8	1.8				
Total		**F**	**302**	**29**	**1.91**	**0.283**		
		%	**91.2**	**8.8**				
Shaking hands and touching stuff of an infected person may lead to infection with COVID-19	7	F	54	5	1.92	0.281	0.812	0.488
		%	16.3	1.5				
	8	F	101	19	1.84	0.367		
		%	30.5	5.7				
	9	F	54	10	1.84	0.366		
		%	16.3	3.0				
	10	F	78	10	1.89	0.319		
		%	23.6	3.0				
Total		**F**	**287**	**44**	**1.87**	**0.340**		
		%	**86.7**	**13.3**				
Persons infected with COVID-19 cannot transmit the virus to others if fever does not present.	7	F	5	54	1.08	0.281	1.933	0.124
		%	1.5	16.3				
	8	F	28	92	1.23	0.425		
		%	8.5	27.8				
	9	F	12	52	1.19	0.393		
		%	3.6	15.7				
	10	F	17	71	1.19	0.397		
		%	5.1	21.5				
Total		F	62	269	**1.19**	**0.391**		
		%	18.7	81.3				
Total score	**7**	**F**	**283**	**130**	**1.68**	**0.145**	**2.221**	**0.086**
		%	**12.2**	**5.6**				
	8	**F**	**601**	**239**	**1.72**	**0.166**		
		%	**25.9**	**10.3**				
	9	**F**	**299**	**149**	**1.67**	**0.163**		
		%	**12.9**	**6.4**				
	10	**F**	**446**	**170**	**1.72**	**0.133**		
		%	**19.2**	**7.3**				
Total		**F**	**1629**	**688**	**1.70**	**0.155**		
		%	**70.3**	**29.7**				
Total of correct answers%		**77.2%**						
Total of wrong answers %		**20.8%**						

N=331