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Graduate School of Health Sciences



Master of Science Thesis

**EVALUATION OF MOBILE HEALTH CLINICS IN THE
STRICKEN REGIONS / IRAQ - SINJAR REGION**

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STRICKEN REGIONS / IRAQ - SINJAR REGION**

BY

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The Department of Public Health Nursing**

The Degree of Master of Science

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Çankırı 2023

ACCEPTANCE AND APPROVAL

We testify that the Master student **Ziyad Jameel Kasim DAHMAN** - Student ID: **208205254** at Çankırı University - Institute of Health Sciences - Department of Public Health Nursing has been examined and defended his thesis entitled (**Evaluation of mobile health clinics in the stricken regions / Iraq – Sinjar region**) and after fulfilling all the necessary conditions determined by the relevant regulations, We saw, as jury members whose signatures below, that the thesis (is sufficient to obtain a master's degree in public health nursing).

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ETHICS STATEMENT

The thesis entitled “**Evaluation of mobile health clinics in the stricken regions / Iraq - Sinjar region**” which was prepared and presented as a thesis, was written by myself and in accordance with the scientific, academic rules and ethical conduct. The idea/hypothesis of my thesis solely belongs to my supervisor and to me. The research pertaining to the thesis was conducted by myself and therefore, all of the used sentences and interpretations within the work belongs to me.

I declare the aforementioned issues to be correct.

17 January, 2023

Ziyad Jameel Kasim DAHMAN

ABSTRACT

EVALUATION OF MOBILE HEALTH CLINICS IN THE STRICKEN REGIONS / IRAQ - SINJAR REGION

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Master of Science in Nursing

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Background: In this study, the effectiveness of mobile health clinics, which are expected to help with disease prevention and control among underserved populations living in the Sinjar region of Iraq, is measured. Additionally, the study evaluates the degree to which the region's residents benefit from mobile health clinics, revealing both their strengths and weaknesses as they function in the stricken regions.

Aim: The main aim of this study is to determine the level of satisfaction with the services provided by the mobile health clinic and health clinics according to the demographic characteristics of the participants.

Method: The population of the study consists of a sample group of at least 175 patients receiving treatment through 10 mobile health clinics in the Sinjar region. The G*Power computer program was used for Power Analysis, with medium effect size ($\eta^2=0.265$), 80% power, and 5% type I error level, one-way Analysis of Variance (ANOVA).

Results: Patients included: 56.7% were male, 41.1% were 18-25 years old, 51.1% were in the rural areas of Sinjar, 54.4% were single, 56.1% were unemployed, 76.7% it was income less than the expenditure and 78.9% of them have not a chronic disease.

Conclusion: It was determined that the satisfaction levels of the patients with mobile health clinics in the Sinjar region and its villages and Camps were very close to each other (average 2.60 points), whereas it was slightly lower in Sinjar center (average 2.49 points). Finally, patients in all three settlements are moderately satisfied with mobile health clinics.

2023, 118 Pages

Key Words: Mobile health clinics, stricken regions, health services, first aids.

ÖZET

ZOR DURUM BÖLGELERİNDE MOBİL SAĞLIK KLİNİKLERİNİN DEĞERLENDİRİLMESİ / IRAK - SİNJAR BÖLGESİ

Ziyad Jameel Kasim DAHMAN

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Çankırı 2023

Genel Bilgi: Dünyanın birçok ülkesinde sağlık sistemi, sağlık hizmetlerine erişilebilirliği artırmak ve sağlık sonuçlarını iyileştirmek için sağlık bakım sunum modelini dönüştürürken, sürekli artan kronik hastalık yükleri ve sağlık hizmetleri maliyetleri bağlamında değişikliklerden geçmektedir. Mobil sağlık klinikleri, izole noktalara ulaşabilen ve kapsamlı sağlık hizmetleri sunmak için donatılmış, özel olarak tasarlanmış dört tekerlekten çekişli kamyonlardır, hassas popülasyonlarda ve kronik hastalıkları olan bireylerde sağlık eşitsizliklerinin hafifletilmesine yardımcı olabilecek yenilikçi bir sağlık hizmeti sunumu modelidir. Kırsal ve yetersiz hizmet alan bölgelerde çok çeşitli tıbbi tedavilere uygun maliyetli bir şekilde ihtiyaç duyan hastalar; mobil sağlık hizmetinin birincil yararlanıcılarıdır. Etkili ve uygun fiyatlı sağlık hizmetleri sunabilen mobil sağlık klinikleri, gelir düzeyi düşük nüfuslara hizmet veren ve düşük maliyetle yüksek kaliteli bakımı destekleyen sağlık sisteminin ayrılmaz bir bileşenidir. Kırsal ve yetersiz hizmet alan bölgelerde, yaşayan hastalar, mobil sağlık hizmetinin birincil yararlanıcılarıdır.

Amaç: Bu çalışmanın temel amacı katılımcıların demografik özelliklerine göre gezici sağlık ocağı ve sağlık ocaklarının sunduğu hizmetlerden memnuniyet düzeylerinin belirlenmesidir.

Yöntem: Araştırmanın evrenini Sinjar bölgesindeki 10 mobil sağlık ocağı aracılığıyla tedavi gören hastalar oluşturmaktadır. Araştırmaya dahil edilme kriterleri olarak 18 yaşında veya daha büyük olmak, gönüllü olarak çalışmaya katılmayı kabul etmek ve Arapça konuşabilmek hususları belirlenmiştir. Araştırmaya dahil edilme kriterlerine uymamak, araştırmaya katılmayı reddetmek ve bilişsel veya psikolojik bir hastalığa sahip olmak ise çalışmanın dışlama kriterlerini oluşturmaktadır. G*Power bilgisayar programı

(Faul *et al.* 2007), güç analizi için kullanılmış olup orta etki büyüklüğünde ($\eta^2=0.265$), %80 güçte ve %5 tip I hata düzeyinde, yukarıda belirtilen amaçlar çerçevesinde tek yönlü varyans analizi (ANOVA) testinin yapılabilmesi için minimum 175 kişiden oluşan örneklem grubuna ihtiyaç vardır. Bu çerçevede araştırmanın örneklemi 180 hasta oluşturmuştur. Çalışmanın verileri hastalara yüzyüze uygulanan anket formlarından elde edilmiştir. Araştırmanın verileri, mobil sağlık kliniği uygulaması memnuniyet düzeyi ve mobil sağlık kliniği uygulaması bilgi düzeyi anketlerinde yer alan ifadelerle birlikte kişisel bilgi formunun uygulanması ile elde edilmiş olup verilerin analizi SPSS programı ile yapılmıştır.

Bulgular: Ankete dâhil olan hastaların kişisel özellikleri incelendiğinde; hastaların %56,7'sinin erkek, %41,1'inin 18-25 yaşlarında, %51,1'inin Sinjar kırsalında, %54,4'ünün bekâr, %56,1'inin işsiz, %76,7'sinin gelirinin harcamasından az ve %78,9'unun kronik rahatsızlığının olmadığı belirlenmiştir. Araştırma grubunu teşkil eden hastaların cinsiyet, yaş, yerleşim durumu, medeni durum, meslek, gelir düzeyi ve kronik hastalık durumu dağılımlarına göre değişkenlerden elde edilen ortalama puanlar arasındaki farklılaşmalar ele alındığında; araştırmaya alınan hastaların gezici sağlık ocağı memnuniyet düzeyi ve gezici sağlık ocağı bilgi düzeyi cinsiyet, yaş ve ikamet yeri değişkenlerine göre istatistiksel olarak anlamlı farklılık göstermemektedir. Öte yandan hastaların gezici sağlık ocağı bilgi düzeyleri mesleki durumlarına ($p=0,03$) ve gelir düzeylerine ($p=0,01$) göre istatistiksel olarak anlamlı farklılık ($p<0,05$) göstermektedir.

Sonuç: Hastaların gezici sağlık kliniklerinden memnuniyetlerinin orta düzeyde olduğu belirlenmiştir. Sinjar kırsal kesim ve kamp bölgelerindeki hastaların gezici sağlık kliniklerinden memnuniyet düzeylerinin birbirine çok yakın olduğu (ortalama 2,60 civarı puan), buna karşılık Sinjar merkezde biraz daha düşük düzeyde (ortalama 2,49 puan) olduğu belirlenmiştir. Nihai olarak her üç yerleşim bölgesinde de hastalar gezici sağlık kliniklerinden orta düzeyde memnuniyet duymaktadır.

2023, 118 Sayfa

Anahtar Kelimeler: Mobil sağlık klinikleri, sıkıntılı bölgeler, sağlık hizmetleri, ilk yardımlar.

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Çankırı-2023

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INDEX OF ABBREVIATIONS

Act.	Transmitted
ASM	American Society for Microbiology
ART	Antiretroviral therapy
Edt.	Editor
Etc.	And such
Etc.,	And others
FHC	Family Health Care
FHS	Family Health Center
HbA1c	Glycated Hemoglobin
HGP	Health Group Presidency
HIV/AIDS	Human Immunodeficiency Virus
MoH	Ministry of Health
OS	Operating System
PCAS	Patient-Controlled Analgesia System
Trans	Translated by.
USA	United States
WHO	World Health Organization

LIST OF SYMBOLS

%	Percentage
$\leq$	Less-than or equal to
$<$	Less-than
$=$	Equal to
$\geq$	Greater-than or equal to
$>$	Greater-than



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1. INTRODUCTION

In many countries, the healthcare system is changing in response to rising chronic disease burdens and healthcare costs while transforming the healthcare delivery model to improve access to healthcare services and outcomes. Apart from this, war, civil unrest, income inequality, poverty, and many diseases increase inequalities in access to health services and disproportionately affect specific populations when accessing health services (Yu *et al.* 2017). The devastating effect of war and internal turmoil on human development and life is increasing daily. War and civil unrest have direct and indirect irreparable effects on the health of the country's population, such as death, injury, and disease. War and internal turmoil destroy societies, families, and cultures, prevent using limited resources for health services and destroy health services and infrastructure (Saçaklıoğlu and Hassoy 2005). In extraordinary situations such as war, the main problem is the inequality between the needs of society and the provision of health services (Kaynak 2005).

In such extraordinary situations, there is an increase in the need for medical care due to internal migration and increased morbidity from health conditions such as secondary population growth, infrastructure, and residual military equipment. These inequalities represent a critical area that needs to be targeted to improve the population's general health and reduce health expenditures. One of them is a mobile health clinic. As a result, policymakers and health professionals must develop new treatments to manage chronic diseases sustainably, promote preventive health, improve outcomes among the general public and communities without access to traditional health care (Yu *et al.* 2017).

Mobile health clinic services are an innovative healthcare delivery strategy that can assist in reducing health disparities in disadvantaged communities and chronic illness of patients. Mobile health clinics are an essential part of the health care system, serving vulnerable groups and providing high-quality care cheaply (Hill *et al.* 2014). Patients in rural and disadvantaged areas that require a wide range of medical services at a low cost are the key beneficiaries of mobile healthcare (Dol *et al.* 2019). According to several research, mobile health clinics are especially helpful in situations such as emergency care,

preventive health screenings and chronic illness management (Campos and Olmstead-Rose 2012). Mobile health clinics can deliver specialized, high-impact, and cheap healthcare that dynamically adapts to society's growing demands by extending its doors directly to distressed communities and exploiting existing community assets (Yu *et al.* 2017).

Iraq is one of the countries most affected by conflict and internal strife worldwide. Sinjar is an Iraqi city and district center located in western Nineveh Governorate, northern Iraq. It is considered one of the disaster areas (Sachs *et al.* 2012), due to the wars that took place in it in August 2014, which led to the destruction of the region and the destruction of all service institutions and basic necessities for life, especially health centers and hospitals. It led to the destruction of the region by more than 80%, as the Iraqi parliament voted to consider Sinjar a disaster area on April 28, 2016. Since more than 60% of the population lives in rural areas and their access to health care is not limited, there are imbalances in access to health services (Schwitters *et al.* 2015).

Although regional differences exist, many hospitals in Iraq were hit during the conflict or damaged due to looting, especially during the war. Although the city's population has increased, the number of health centers has decreased. On the other hand, a significant part of the equipment in hospitals has either become out of function or is necessary for renewal and repair. Ambulance and emergency services were sometimes utterly dysfunctional due to inadequate equipment and supplies. As transportation and communication facilities are limited, coordination, supervision, and training cannot be provided. Lack of communication and papers led to inadequate primary health care records (Kaynak 2005). This situation is characterized by inadequate access to health services related to communicable and non-communicable diseases, particularly in rural areas and refugee camps. A potential solution to some of these barriers is mobile health clinics. Specially designed four-wheel-drive trucks that can reach isolated locations and are equipped to deliver comprehensive healthcare. Services are provided in vehicles of mobile health clinics, nearby tents, or other structures (Schwitters *et al.* 2015).

However, the provision of health care through a mobile unit (mobile team or mobile clinic) was not considered or explored as a potential method of providing medical treatment to the Iraqi population until 2010. With an influx of more than 1.8 million IDPs and nearly 250,000 Syrian refugees, the authorities faced difficulty delivering health care to those in need, including refugees and Iraqis (Lami *et al.* 2019). As a result of these developments, it was predicted that using low-cost innovative health interventions such as mobile health clinics in Iraq could help improve disease prevention and control among disadvantaged populations. Working with the Ministry of Health (MoH), the Health and Nutrition Cluster aims to ensure equal access to essential health services for affected populations. Established a working group to set standards for the functioning of mobile medical services (Saleh *et al.* 2018). However, although the principle of mobile health clinics is to deliver health care to the doorsteps of affected communities in Iraq, especially in the Sinjar region, and to treat the population in need of primary health care, health care providers and government agencies are committed to the operation of memory management units and ensuring equal treatment of affected populations. Due to the lack of guidelines, it was difficult to decide which services should be provided through mobile health clinics (Al-Ani *et al.* 2013).

On the other hand, this study evaluates the extent to which the residents of the Sinjar region of Iraq benefit from the established mobile health clinics and reveals the strengths and weaknesses of the functions of mobile health clinics under challenging regions.

1.1 Purpose and Importance of the Study

The major goal of this research is to review the existing literature on mobile health clinics and their current function in the Iraqi healthcare system. As a result, evaluate the efficiency of mobile health clinics that are supposed to aid in disease prevention and control among the impoverished population of Sinjar, Iraq, and evaluate the extent to which the district's population uses mobile health clinics (Abbasi *et al.* 2016). Health clinics attempt to demonstrate the benefits and drawbacks of mobile health clinic services in challenging situations. Despite their breadth and relevance in providing care to a diverse range of at-risk populations, there has been a scarcity of research on the

cumulative impact of mobile clinics. These studies discuss the services provided by mobile health clinics, their target audiences, and their costs (Malone *et al.* 2020), as well as the impact of mobile health clinics on access, coverage, costs, and quality of services provided to vulnerable populations (Hill *et al.* 2014), and disease diagnosis made in mobile clinics. The prevalence of mobile health clinics (Bassett *et al.* 2014, Geoffroy *et al.* 2014, Schwitters *et al.* 2015) and challenges encountered in mobile health clinic service delivery; were discussed. As a result, current research focuses on the acceptability, prospective use, cost, and quality of mobile health clinics as a service delivery method. There are few theoretical and empirical investigations on service recipients' satisfaction levels with mobile health clinics. The research is believed to be critical in contributing to the literature. Another significance of the research is the evaluation of the mobile health clinic project, the evaluation of the extent to which people living in the stricken regions benefit from mobile health clinics, and the understanding of the ways and techniques of providing health services based on the stricken region. In addition, the nature of the mobile health clinics.

1.2 Research Questions

By the primary purpose of the study, answers to the following questions are sought:

- What is the knowledge level of the participants about the mobile health clinic?
- What are the attitudes of the participants about the mobile health clinic?
- Do participants' knowledge level, average satisfaction with the mobile health clinics differ according to demographic characteristics?

1.3 Assumptions

The assumptions of the research are listed below:

- In the study, an interview form was used to determine the opinions and thoughts of the participants about the medical care they received from the mobile health clinic.
- Agreeing to participate in the study voluntarily.
- It was assumed that the answers given by the patients in the questionnaire reflected their real thoughts.



2. GENERAL INFORMATION

2.1 Service Concept

The concept of service is constantly encountered in many areas of today's globalizing world. For this reason, many definitions of the concept of service can be mentioned.

For example, according to the US Marketing Association, Lancaster and Massingham in 1998, the concept of service is defined as the efficiency, remedied deficiency. Satisfaction performed in line with the sale of products or products offered to the market is an independent product that provides needs and desire satisfaction when marketed to end consumers or organizations without being dependent on selling a good or service (Lancaster and Massingham 1998). Referred to as "identifiable activity."

According to Stanton in 1991, the concept of service is expressed as an activity and performance offered by one party to the other, which is essentially intangible and does not give ownership rights to anything (Stanton 1991). Considering Willson's in 1999, definition, the concept of service; is a tangible product that includes work, movement, or effort that cannot be physically possessed (Willson's 1999). It appears as a product of personal and mechanical efforts Transmitted (Üner 1984).

2.2 Common Features of Services

The service appears as an abstract theory but is not felt physically. Since the intangible, it is impossible to decide whether a good quality is or not before consumption. The results of this feature of the services in terms of marketing are shown below:

- Services cannot be stocked. From this point of view, there are difficulties in managing possible fluctuations in demand.

- Services are tough to patent. From this point of view, there is a danger that new concepts of service can be imitated easily.
- Services cannot be displayed readily or conveyed to consumers (Tengilimoğlu 2012: 45).

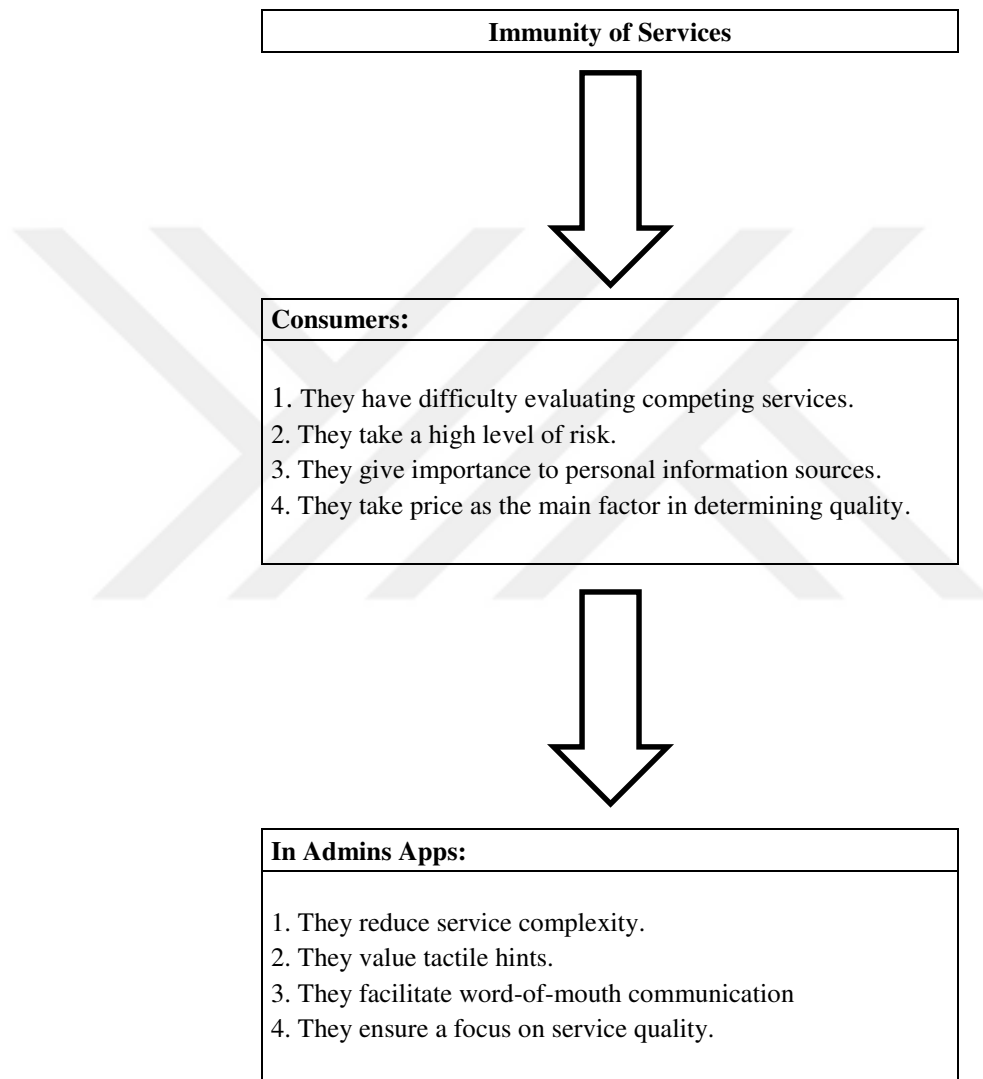


Figure 2.1 Consequences of the abstraction of services (Tengilimoğlu 2012: 45)

It is not possible for services that cannot be used within a specific time period to be accumulated for use on another day (Odabaşı and Oyman 2008). In other words, if they are not used when offered to a consumer, services are wasted because they cannot be stored. Irregularity in the demand for some services causes the perishability of those

services to rise to higher levels (Peşkircioğlu 1997). Ignored the perishability feature (Parasuraman *et al.* 1985). While describing the characteristics of the services, he ignored the perishability feature. Although the feature of perishability is similar to the feature of inseparability, while the feature of inseparability means simultaneous production and consumption (Öztürk 2000; Boudreaux *et al.* 2014), states that the feature of perishability means that services cannot be stored, stored, returned, or resold. The consequences of the perishability feature of the services are given below.

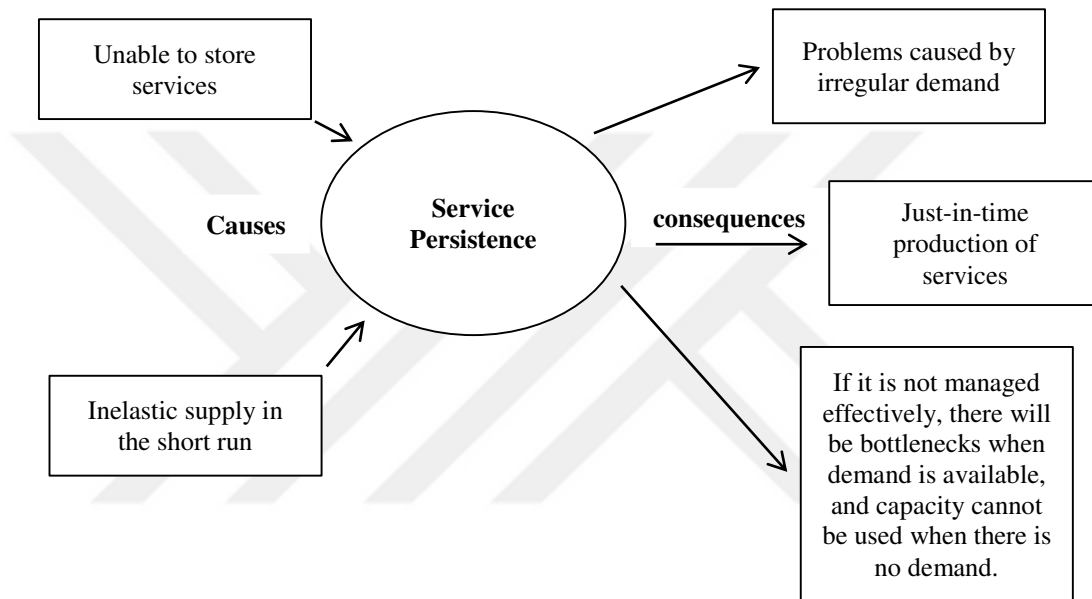


Figure 2.2 Causes and consequences of service perishability (Yıldır 1994: 56)

Some of the consequences of simultaneous production and consumption of the service are given below.

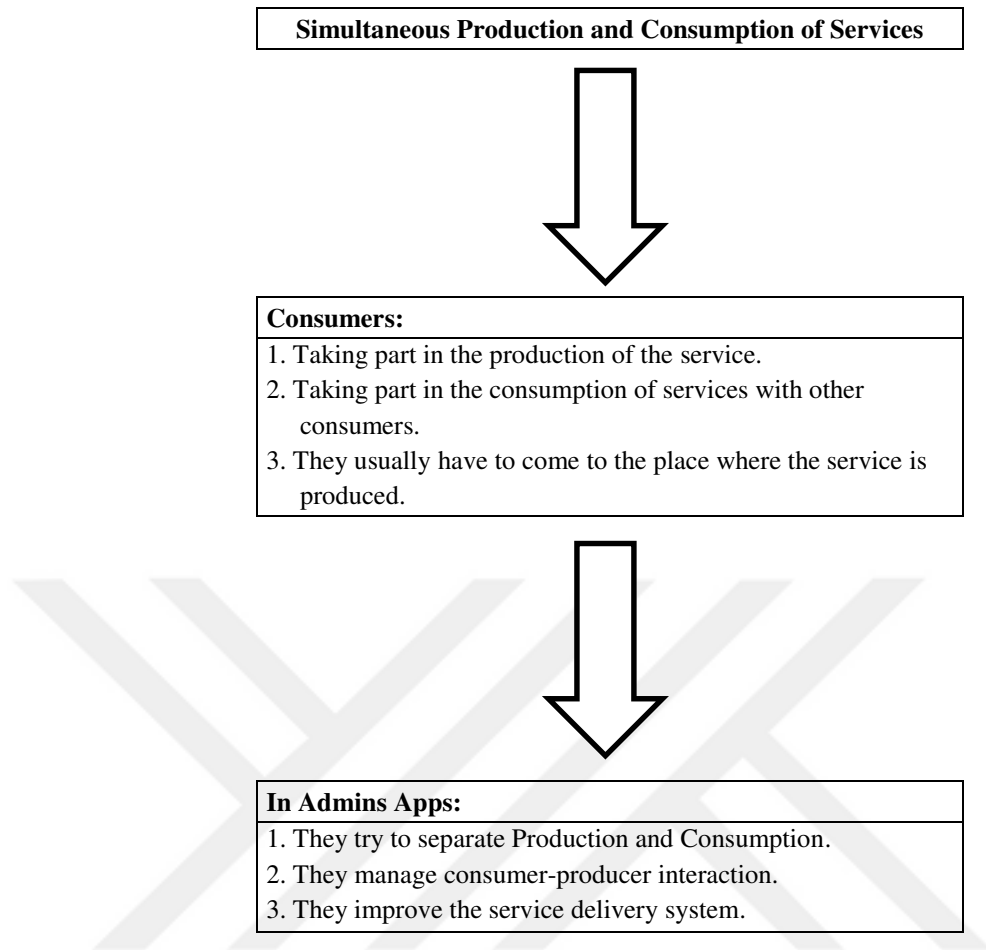


Figure 2.3 Some consequences of simultaneous production and consumption of the service (Eser ve Korkmaz 2011: 8)

Since services are generally dependent on people, they have a heterogeneous structure. The performance of services can naturally differ in the direction of producers, consumers, and time (Parasuraman *et al.* 1985: 42). Due to the variability and heterogeneity of services, the quality of services varies according to where, when, and how they are provided and especially in line with the service provider (Mucuk 2006: 58). Another critical issue related to this issue is the difficulty in evaluating the service quality (Öztürk 2000: 78).

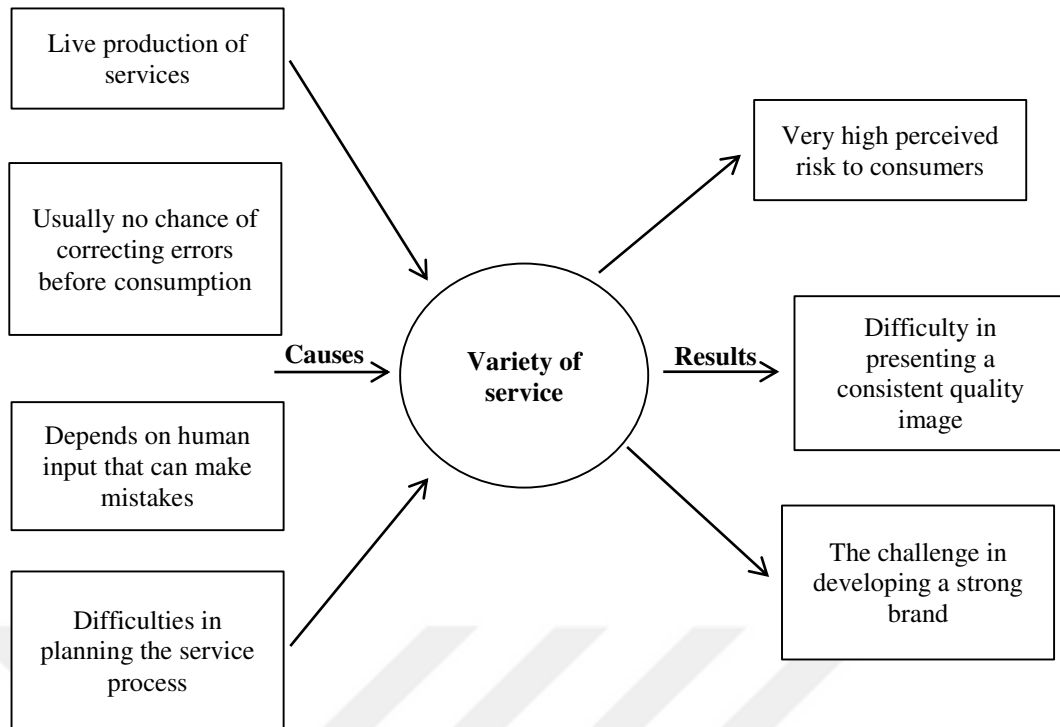


Figure 2.4 Causes and results of diversity in services (Öztürk 2000: 79)

The differences between service and product are shown in the figure below

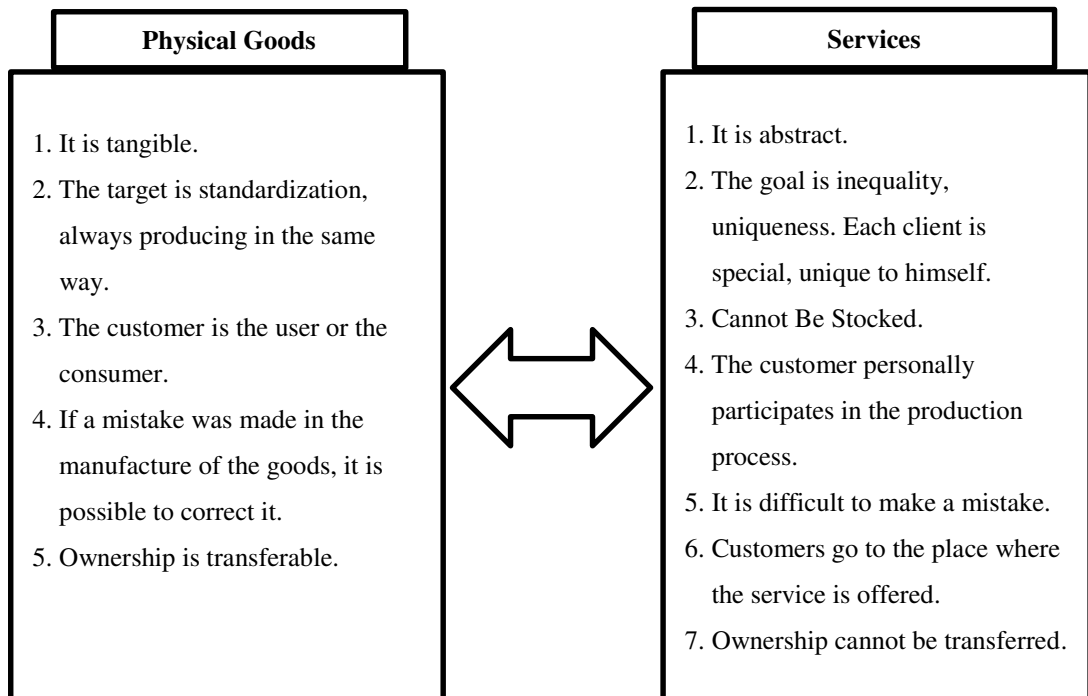


Figure 2.5 Differences between the attributes of services and physical goods

2.3 The Concept of Health and Health Services

The World Health Organization defines health as “not only the absence of disease or infirmity but a state of complete physical, mental and social well-being” (World Health Organization 2006). The promotion and development of health can be considered as a means of achieving a result that can be described in functional terms rather than abstract terms and as a resource that allows individuals to lead a positive life in terms of individual and social-economic aspects (Sartorius 2006: 58).

The meaning of the word disease can be different for doctors and non-physicians. Doctors define the disease as: “It is a state caused by abnormal structural and functional changes in tissues and cells.” To non-doctors, the word's meaning is related to the person's culture. As the health culture rate of the person increases, the definition approaches the definition of the doctor (Laar *et al.* 2019). In general, if the symptoms of the disease increase to a level that prevents it from working, the person considers himself sick. Social scientists define it this way: “A person is considered sick when he cannot perform the social role expected of him.” For example, if the person is coughing, that person is sick in the doctor's opinion. If coughing does not prevent the person from working, the person does not consider himself sick. A person with a complex, adherent, painless gland on his neck may not realize his health problem. On the other hand, this person may be a patient who has lung cancer and will die in a few months (Temel *et al.* 2006).

Illness is never just the problem of the sick person. One person's illness usually affects at least the whole family. For example, if a child falls ill in a working-class family, it affects everyone. First of all, if the mother or father is an employee, they cannot go to work and can be dismissed. The mother and father, who have to take care of the sick child day and night, also impair their health. Mother or father workers cannot sleep at night and go to work tired. As it is known, fatigue is one factor that increases the probability of occupational accidents. Individuals' health also depends on their diseases and conditions in the regions where they live. For this reason, it is not correct to consider the health of workers and their families separately from the whole country's health (Tözün and Sözmen 2015).

According to this definition, it is understood that health is a multidimensional and quite complex concept. At the same time, many interrelated elements directly or indirectly affect health.

The service industry is classified into ten categories by the American Marketing Association:

- Health Service.
- Services of the distribution.
- Financial services.
- Professional services such as advocacy, accountancy and architecture.
- Sports, arts, and entertainment services.
- Non-profit services and public semi-public.
- Accommodation, tourism services and travel.
- Rental services and physical distribution.
- Telecommunications services.
- Personal care and repair services (Öztürk 2000).

According to Mucuk in 2006, services are expressed as the benefits customers purchase unfairly (Mucuk 2006). According to Tenekecioğlu in 1992, services are expressed as benefits or saturations directly offered for sale or obtained from selling products and services (Tenekecioğlu 1992).

Health care is a social feature in today's world and concerns the whole population. In today's globalizing world, health services include all the features developed for the concept of service and various features. The differences in goods and services produced in the health field from general economic categories arise from the product's structure. For example, it would not be correct to evaluate equipment directly related to health and life, such as wheelchairs, pacemakers, and glasses, in the same category as other products, such as automobiles and televisions, in the economic literature (Al-Ani *et al.* 2013).

A distinctive feature of health care is that it is impossible to substitute any other industry for the provision of health care. For instance, the treatment of rotting teeth, which is less expensive than heart valve surgery, is unavailable. These circumstances highlight the "non-substitutable" character of health care (Aguwa *et al.* 2018). The value of healthcare services cannot be calculated directly. The health of individuals and communities improves when medical care is accessible and affordable. One of the trickiest things to pin down and quantify is health. When you're healthy, you can take full advantage of life. Housing requirements, mental fortitude, educational attainment, food quality and diversity, environmental cleanliness, and availability of health care facilities all have a role in an individual's general health (Marshall 1977).

According to Sonemez and Seyhan (2016), a healthy population is a good indicator of a country's overall health. The World Health Organization (WHO) defines health as "full mental, bodily, and social well-being," as opposed to "mere absence of disease." To fully grasp this notion, one must have a holistic view of health (WHO 2011). According to another definition, health is when people are physically, psychologically, and socially healthy enough to adequately care for themselves and others in different personal and social situations (Bedworth 1992). Based on these definitions, being healthy is one of the fundamental rights of every individual, and health services have an essential role in protecting and maintaining health.

Healthcare refers to any medical or curative care or service, including supplies provided with the care or service. Health care includes all the services related to maintaining, promoting and restoring health or diagnosing and treating diseases. Health services is a permanent system organized throughout the country by health institutions and organizations by making use of different health personnel to achieve changing goals according to social demands and needs, and thus to fulfill the curative and preventive healthcare activities of individuals and society (Çıraklı and Sayım 2009). Health services are the most visible functions of any health system for users and the general public (Al Gul Mohammed 2018).

Health services (Kavuncubaşı and Yıldırım 2012), which generally cover the studies carried out to cure disease and protect the health, are like an excellent public service whose consumption cannot be postponed, whose scope and size have not been tried before and whose scope and size have been determined by the doctor (Tengilimoğlu *et al.* 2011). It is possible to list the main features of health services that distinguish them from other services as follows (Kavuncubaşı 2000):

- Health outcome is difficult to measure and define. As in other sectors, it is not possible to see and evaluate the results of health services in a short time.
- Many professional groups provide health services. In addition to different medical services, functions such as hospitality, technical services, training, automation, examination, consultancy, and transportation are offered in a limited area.
- The services offered within the scope of health services are complex and variable. In addition to diagnosis and treatment services, education and research services are also provided. As the number of services provided increases, the level of complexity increases.
- There is a high level of specialization in health services.
- Health services are services with high functional dependency. A high level of coordination is required between different occupational groups.
- On the other hand, health services are divided into four categories (Figure 2.6).

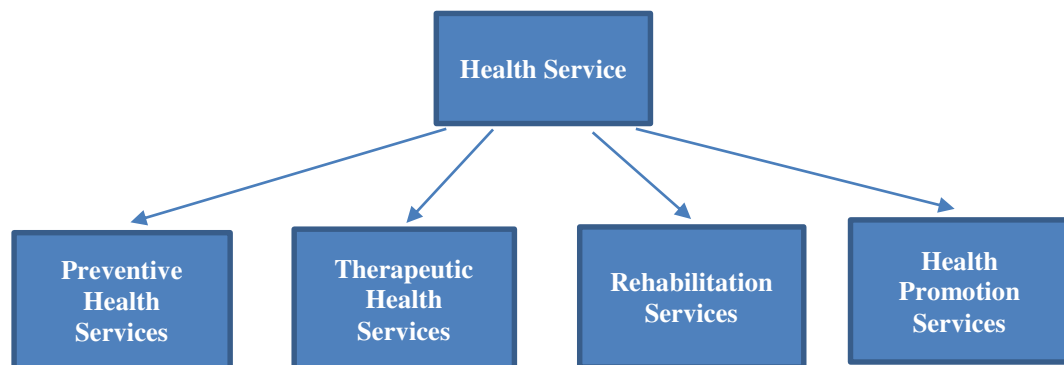


Figure 2.6 Classification of health services

Preventive Health Services: It includes the measures taken towards the individual and the environment to protect and develop individual and community health. These services have low cost and high impact (Çıraklı and Sayım 2009).

Therapeutic health services: These consists of medical services that aim to improve the current state of health by eliminating diseases and disabilities. These services are mainly the responsibility of the doctor and are carried out with the participation of other medical professionals. Health status is the medical services provided to people who have reached their previous level of health. It can be considered outpatient, inpatient, and home care services (Bozkurt 2020).

Rehabilitation Services: These are the medical services provided by fixed or non-bedded rehabilitation centers organized to prevent or minimize permanent discomfort and disability caused by diseases and accidents that affect daily life and continue the person's life (Bozkurt 2020).

Health Promotion Services: Services are given to help healthy people enhance their health.. The main task in the health promotion field falls on individuals' shoulders. Promoting healthy lifestyles; aims to improve mental and physical health, quality of life and longevity (Samancioğlu and Karadakovan 2010).

2.3.1 Primary health care within health services

The provision of health-related services in a country-wide, region-based, and categorical manner was brought forward in England in 1920 (Dirican 1990). Health services are included in the definition of rehabilitation services if they work to protect people before the disease occurs, treat them after the disease occurs, and ensure that people with a disability in the body can continue their lives from the medical and social sides. Recently, health promotion services aimed at improving the level of health and health services have been divided into four groups. Therapeutic health services are implemented in three categories. At the first level, health institutions provide outpatient and primary medical

care. In the other category, there are health institutions where treatments for diseases that require inpatient treatment are made. In the third and last category, there are institutions where advanced medical technologies are available to treat a particular disease (Bektaş and Şimşek 2016).

Greenhalgh, the health service unit, provides services for preserving health care, services for the development of health, and services that correspond to the primary level of health care; defined as the places closest to the communities and where the first application can be made (Greenhalgh 2008). Meeting lifelong health needs and addressing broader determinants of health through multi-area action and policy can achieve the goal by empowering families and communities to fulfill their health obligations. However, the primary health services accepted within the scope of the Alma Ata Conference; health education, improvement of nutritional status, clean water supplies, family planning, maternal and child health, and the management of infectious diseases, treatment of joint injuries, and provision of essential medicines are not considered as services to be provided only by primary health care institutions. Greenhalgh states that the services should be updated in parallel with the changing health risks and advanced technologies (Greenhalgh 2008). When the literature was examined, WHO was accepted as a guide, and the definitions of TSH were made here. Within the scope of WHO, TSH is accepted as health services that include improving health, preventing diseases, applying treatments, rehabilitation, and palliative care.

According to Öztekin, the term "Primary Health Care" in Turkey; is not appropriate to translate into Turkish as "primary health care." He states that the Turkish equivalent of the term "basic health services," which is another concept in the English language, would be appropriate (Öztekin 2005). According to Hayran, the concepts of primary health care in Turkish correspond to "primary health care" and the concept of "primary care" to primary health care. Primary care is mentioned as institutions that provide preventive health services for the person within the scope of outpatient diagnoses and treatment. Primary health care is used instead of essential health service concepts. However, the services provided are only a part of the essential health service. The scope of primary health care is broader and includes the objectives that more than one institution will put

into practice jointly. Primary health care; it is widely accepted as the name of the health service that is provided to all people living in a country, which is planned as the closest place to the region they live in, where they can access health problems the fastest and where they apply for them to the first time to use the health service. It is emphasized that it should be done (Hayran 2012).

According to Öztekin 2005, the primary healthcare concepts discussed in the title refer to the network of official health institutions that deliver certain preventive and remedial services to people. Primary health care services are considered studies planned from central regions; the government appoints personnel. When the quality of the service is considered, technologies suitable for the services are used with the public's participation. At the same time, many sectors put into practice jointly (Öztekin 2005).

Social determinants determining health can vary positively when the health care feature is taken. With the decrease in incomes, deterioration in nutrition may occur, and in parallel, their immune systems weaken and they become weaker against infections. It is essential to search for health understandings in all actions that develop under the influence of social class-determining conditions (Baloglu 2005). It is observed that severe inequality in the access of the people in the lowest class to health services both within the scope of the countries and within the countries themselves continues. In eliminating such situations, the primary health service, which is provided widely and equitably, even in places where social inequalities are most prevalent, contributes to improving health and minimizing health inequalities (Soyer and Öcek 2007). Poverty, the primary determinant of health, and the situation of inequality parallel with it are essential. And to overcome this, it is necessary to ensure social justice. It is possible to analyze inequalities by performing class analyses. The only reason for inequality is not which social class a person belongs to. In addition, it is known that inequalities occur between gender, age, place of residence, and ethnic classes.

There are structured criteria widely used to measure the primary health care service under the title. One of them is the criteria accepted as PCAS criteria. Accordingly, continuity, accessibility, comprehensiveness, clinical interaction, coordination, trust, and

interpersonal treatment are accepted as antecedents (Bektaş and Şimşek 2016). Continuity condition is met only on a longitudinal and visit-based basis. This makes it essential for the population to be followed up by health personnel at specific intervals for long periods. From the rule of inclusivity, it provides a preventive counseling service against diseases by providing all the information about the patients. Coordination refers to the monitoring of patients at home when they get sick while they are hospitalized. Performing examinations by interacting with the patient is called clinical interaction. Interpersonal treatments are the time spent with physicians' sincerity, patience, respect, and compassion. If interpersonal trust and treatment are within reach, it is essential that physicians can see their competence and their impact in the eyes of patients (Değirmenci 2021).

2.3.2 Barriers to access to health services

Disadvantaged parts of society have poorer health and face more significant difficulties in getting health care than the overall population. This demonstrates the importance of health institutions reaching out to these populations (Yu *et al.* 2017, Jung *et al.* 2014).

Vulnerable communities, such as displaced populations, migrants, the homeless, migrant workers, children and the uninsured, have historically been removed from standard healthcare settings and require assistance in getting care (Hill *et al.* 2014, Viera *et al.* 2006).

Campos and Olmstead-Rose (2012), Jupka *et al.* (2008), and Mandal (2014) list the following factors as impediments to providing health care to the general public and those most in need. Having no legal standing; Feeling intimidated in healthcare facilities; Language and cultural difficulties.

Insurance issues; a shortage of medical professionals; a lack of patient-centered care; high expenses; inconvenient office hours; logistical difficulties; emotional hurdles; time

restrictions at work; distance from home; and a lack of available transportation or geographical proximity (Gibson *et al.* 2014).

If we want to enhance population health and reduce health care expenditures, we must eliminate this disparity. Therefore, governments and health professionals must create innovative treatments to improve outcomes for both the general public and marginalized populations by facilitating the long-term management of chronic diseases (Yu *et al.* 2017). One potential answer to this issue is the use of mobile health clinics. Health inequalities among the most disadvantaged populations and those with chronic conditions can be mitigated by the use of mobile health clinics, a novel approach to healthcare delivery (Campos and Olmstead-Rose 2012). After discussing the problems people face while trying to seek medical care, the paper goes on to focus extensively on mobile health clinics as a potential solution.

2.4 Mobile Health Clinics as a Solution to Problems Encountered in Access to Health Services

Despite continued efforts to improve access to quality of health care in developed countries for their growing populations. Health care is characterized by rising costs and the increasing prevalence of chronic diseases. In such a situation, it is essential to provide cost-effective healthcare facilities. Studies have proven that distance is one of the most influential factors in healthcare facilities. While distance affects what type of medical service a patient will use, distance is the determining factor, especially in rural regions, for whether a patient will use a medical service (Doerner *et al.* 2007, Holman 2020). In addition, the underrepresented population cannot afford the high healthcare costs in hospitals. Many diseases disproportionately affect these populations due to inequalities in access to health care. These inequalities represent a key target area for improving the country's overall health and reducing health expenditures (Yu *et al.* 2017).

Medical facilities close to the homes of people without access to health care are essential to addressing these concerns because they allow for better management of chronic diseases, promotion of preventative therapy, and improvement of population health. To

this end, governments have crafted regulations to facilitate the provision of primary health care on-the-go to underserved populations in rural regions without access to health facilities (Abbasi *et al.* 2016). Mobile health clinics, as stated by (Aung *et al.* 2015), are a community-based option that can minimize costs, improve care delivery, and lessen health inequities. Many countries' health programs have taken into account the establishment of mobile clinics in recent years. These mobile clinics, which provide various medical and health services, have a variety of applications in both convenient and catastrophic scenarios. It is typically able to accept and treat patients with severe conditions, and it is occasionally equipped to provide specialist medical services (Norouzi 2006). Establishing these mobile clinics enhances overall medical care quality and access to fundamental medical requirements. It also provides impoverished patients with improved healthcare and medical equipment. As a result, most of these mobile clinics' customers are persons living in places with no proper healthcare infrastructure, such as patients with limited resources or elderly patients who cannot receive medical assistance elsewhere (Aljasir and Alghamdi 2010). Mobile clinics can help the destitute, mentally disabled, immigrants, and addicts, among other populations, get healthcare (Collinson and Ward 2010).

For elderly patients, pregnant women, and toddlers who need constant medical care, mobile clinics are essential in some far-flung areas due to the poor quality and condition of roads and a lack of suitable transportation. In accordance with national healthcare policies, these facilities treat patients regardless of their geographical location, their ability to pay, the type of medical care they need, or the state of their health (Aljasir and Alghamdi 2010). Mobile health clinics are utilized in urban and rural regions to deliver targeted health services to underserved populations. These clinics offer various medical and health services in catastrophe scenarios and unique medical gadgets for temporary admission and treatment of patients in critical conditions (Aguwa *et al.* 2018).

2.4.1 Strengths and weaknesses of mobile health services

Providing appropriate and timely care is one of the most difficult tasks in every country's healthcare system. Mobile specialty clinics that use volunteers directly and work in

crucial situations have emerged to the fore in recent decades as a way to address patients' basic needs (Council 2007). Every new plan or approach will have strengths and limitations that emerge before, during, and after implementation, and many will have a continual evaluation to avoid difficulties and complications. Mobile clinic schemes performed in numerous nations have seen considerable success and widespread criticism (Abbasi *et al.* 2016).

According to research findings that investigate the strengths and weaknesses of mobile health clinics and aim to answer questions such as whether these clinics can meet the positive and negative aspects of people's basic medical needs, mobile clinics provide care to populations that are difficult to reach with the traditional system, improve access, and support prevention and chronic disease management. Mobile clinics can use their abilities to overcome access hurdles and establish reliable connections to minimize inequities, enhance health, and save costs (Hill *et al.* 2012).

"What are the benefits and drawbacks of mobile clinics?", the findings of many studies were evaluated. According to these studies, mobile clinics provide a wide range of therapies and serve a diverse population, including those with various socioeconomic problems in both urban and rural settings, at all levels, and for both acute and chronic disorders (Krol *et al.* 2007). The portability of health clinics on wheels means they can serve populations that would otherwise be inaccessible to conventional medical care, and their deployment can be adjusted to meet the evolving demands of a given community. Mobile health clinics are in a unique position to alleviate the effects of location, time, distance, and transportation as they relate to gaining access to healthcare. In addition to the aforementioned advantage, they may also provide a wider variety of services. There is a lot of room on the inside of the vans for any equipment the client needs, from exam rooms to mammography machines. Since the demands of both providers and the communities they serve can be different, mobile clinics can be adapted to accommodate them. Connecting clinical and community settings, mobile health clinics also have the potential to increase patient trust in the healthcare system (Aung *et al.* 2015).

Screening and prevention are prioritized in mobile clinical projects, which is one of their main benefits (Abbasi et al. 2016). One of the advantages of mobile clinics, according to another study, is that they make medical treatment accessible to those who need it most, including the poor, the uninsured, and the young and old (Vermont 2007). In times of crisis, these communities are among the most defenseless, but doctors and nurses tend to ignore them because they lack basic rights or are socially weak. This limits the accessibility of quality healthcare for these communities. In turn, this lack of support might give rise to or intensify preexisting issues. Moreover, these medical centers have the adaptability to meet the changing requirements of these communities (Gibson *et al.* 2014). Although there are positive aspects to these mobile clinics, there are also negative aspects that have been highlighted by other research. These flaws include insufficient information on the viability of such clinics, competition from other health institutions and other organizations, a lack of government commitment to sponsoring such clinics, and inefficient resource allocation. Aljasir and Alghamdi (2010), Ghada and Al Attar (2009), Song et al. (2013) all point out that these clinics have challenges such as a lack of private funding and professional staff, a shortage of facilities like electrocardiography, and a lack of patients who are willing to use them. Mobile health clinic pilot initiatives can be risky for organizations due to potential operational and logistical difficulties.

There is a lack of understanding of how a mobile healthcare unit functions, both within the healthcare industry and among employers. For instance, it will be difficult to know where and how to place the mobile health vehicle strategically. It can also be challenging to provide on-the-go internet connectivity and to install IT infrastructure in mobile health vehicles. The existing manner of payment also continues to be an obstacle to widespread use (Aguwa *et al.* 2018).

A lack of a clear framework for these clinics in policymaking, existing legislation, and healthcare practitioners' strategies appears to be at the root of many of the problems associated with mobile clinics, as reported by a number of studies. Efforts to establish mobile clinics will be recognized as an integral part of the healthcare system, and the appropriate policies, guidelines, and laws will be put in place. That can help define the roles of mobile clinics while also reducing the number of projects that need to be repeated.

One of the main reasons for a mobile clinic's limited use is a shortage of funding. It's important to emphasize that sound financial backing for these clinics can come from sound planning and regulations as well (Abbasi *et al.* 2016).

2.4.2 Basic principles in the execution of mobile health services

There are some basic principles for the implementation of Nihil health services. We can list them as follows (www.ihsm.gov.tr):

Mobile health services are preventive health services provided to villages, districts, and families outside of a health facility and outpatient services for diagnosis and treatment when necessary.

Mobile health services are provided regularly within the scope of primary health care services.

Primary health care services are provided to those who cannot benefit from health services for various reasons through mobile health services at their residence. For this reason, preventive health services and outpatient diagnosis and treatment services for risk groups are primarily provided in risky places (away from health facilities, places with high population density, etc.), and risk groups (babies and children, pregnant women, mothers, chronic patients and the elderly).

A visit is planned at least once a month for mobile health services. The number of visits may be increased based on the nature of the services offered.

While planning, they try to ensure that they visit the same settlements on the same days of the week. While providing mobile health services, tasks are carried out within the plan's framework. Planning is done monthly, and the region where the mobile team will operate is announced the day before the visit. Personnel, vehicles, fuel, and travel program needs

determining at the Family Health Center (FHC) level and Health Group Presidency are reported to the provincial health directorate monthly.

The planning and implementation of mobile health services are carried out at the FHC, to which the settlement is connected. If the ASM conditions are not suitable; (lack of personnel, vehicles, etc.) Cooperation is made with relevant institutions/organizations such as the Health Group Presidency (HGP).

Mobile healthcare is preferably provided by a healthcare provider, in a community-acceptable location or home with appropriate facilities.

2.4.3 Services provided within the scope of mobile health services

Mobile health services give additional medical services to patients to fulfill their immediate requirements. These services include dental care, eye care, malaria therapy, human immunodeficiency virus (HIV/AIDS) treatment, blood pressure and diabetes control, and so on (Geoffroy *et al.* 2014). Mobile health clinics typically provide primary and preventative care, but they can also provide mental health, dental care services, maternity, newborn health and chronic disease management (Holtshousen and Smit 2007).

Substance abuse treatment asthma, pap smear tests, allergy care emergency care, HIV testing, pediatric care, and speech therapy are all provided through private clinics (Jones *et al.* 2005).

Approximately half of the mobile clinics offer several services, while most customers are served by other health care and social support institutions (Oriol *et al.* 2009).

According to the MoH Directive on the Execution of Mobile Health Services, the services provided within the scope of mobile health services are listed as follows:

- Birth care services,
- Child health services,
- Vaccination services,
- Infectious disease control,
- Chronic disease control,
- School health services,
- Medical services for the elderly,
- Reproductive health and family planning services,
- Diagnostic and treatment services (if necessary),
- Health education,
- Environmental services.

When it comes to addressing health inequities and removing barriers to care, mobile health clinics are the way to go. It's a vital service because it helps people who may otherwise go without essentials like legal aid, a safe place to live, or enough to eat (Aung *et al.* 2015). Community centers typically benefit from the preventative treatment and health education provided by these mobile clinics.

2.4.4 Planning of mobile health service

Mobile health services are provided to 750 registered people at least once a week and to 750 or more registered people at least twice a week. If a health facility belongs to the Ministry of Health in the stricken regions, these facilities can be used for service. It is performed by the family physician for at least two hours a month for every 100 people, considering the geographical location, climate and transportation conditions, and the number of adjacent settlements. The family doctor prepares a monthly mobile plan and/or social and medical care in the first month of the contract, reports it to the health center at the place of residence, and implements it until the end of the contract (Aydın 2013).

2.4.5 Strategies of mobile health clinics

Many mobile clinics, in general, have some techniques to apply. These are as follows (Yu *et al.* 2017):

- Geographical and logistical convenience
- Trust relationship
- Emergency flexibility
- Improving health outcomes
- Initiating preventive maintenance

All these strategies have been shown to overcome barriers resulting from a sense of entitlement among minority communities and poor patient-provider communication, insecurity (Clark *et al.* 2011, Kullgren *et al.* 2012, Nelson 2002).

Geographical and logistical convenience: Most mobile health clinics assist those who lack the time, resources, or inclination to travel to traditional clinics by bringing vital services to their homes, often for free and without onerous paperwork. According to a qualitative study, customers prefer the convenient local settings that only mobile clinics may occupy (Hamilton and Barlow 2003). Mobile health clinics give vulnerable communities a sense of accessibility and visibility by reducing many logistical barriers to traditional forms of health care, such as appointment difficulties, transportation concerns, complex administrative processes and long wait periods (Diao *et al.* 2016).

Relationship of trust: Many effective mobile clinics attribute their success to their ability to build trusted connections. Individuals are frequently denied healthcare owing to a lack of faith in a system that does not appear to be designed for the advantage of customers. With their patient-centered design, mobile clinics are well-positioned to reestablish these patients' confidence and reconnect them (Clark *et al.* 2011). Because mobile clinics try to engage communities physically, residents believe that the clinics are reaching out to them

and inspiring them to take more responsibility for their health. As a result, mobile clinics foster trust-based relationships through creative space utilization (Carmack 2010).

Emergency flexibility: Mobile health clinics are useful during disruptions in health care because they may be swiftly adapted to fit the needs of certain populations. In January 2016, for instance, the city of Flint, Michigan, experienced lead poisoning from its public water supply, prompting the city to declare a state of emergency and the federal government to declare a national emergency. Since 2014, it is estimated that between 6,000 and 12,000 children have been exposed to contaminants. Research shows that between 2013 and 2015, the percentage of Flint children under the age of five with elevated blood lead levels rose dramatically, from 2.4% to 4.9%. This increase was most pronounced among children living in low-income neighborhoods (Hanna-Attisha *et al.* 2016). The Child Health Fund has teamed with Hurley's Children Clinic to offer a mobile health clinic to the region in response to the significantly high health requirements and poor accessibility of children affected by the water crisis (Johnson 2016). The clinic can offer a variety of services, including a place for children from low-income areas of the affected region to receive medical care, as well as basic tests for lead poisoning and developmental problems, as well as full general healthcare (Allen 2016). Due to their portability and adaptability, mobile clinics are able to give prompt access to medical care in a variety of settings.

Improving health outcomes: Mobile clinics are a great way to provide medical care to people who might not otherwise get it, such as the homeless or those with various health risks. In this way, they may encourage people from all walks of life to take part in health exams (Edgerley *et al.* 2007). A higher proportion of patients using mobile clinics in Baltimore agreed to get tested for HIV, according to a study comparing the two types of clinics. The percentage of positive HIV testing was considerably greater in mobile clinics (54.4% vs. 7.1%) than in stationary healthcare facilities. Data like this suggests that high-risk populations can be more easily reached by mobile clinics, allowing for more frequent HIV screening (Ellen *et al.* 2003). Because of their accessibility, mobile clinics can play an important role in the prevention and early detection of infectious and chronic diseases in non-traditional settings (Alvi *et al.* 2015).

Initiating preventive care: By effectively removing barriers to healthcare access, mobile clinics provide underserved individuals with an additional opportunity to screen for a wide range of ailments and acquire knowledge about how to better manage their own health (De Jesus DiazPerez *et al.* 2004). Pregnant women from a minority group in Miami who use mobile clinics are more likely to start obtaining prenatal care services than mothers who use other clinic types, according to the study's authors. There was also a reduction in the number of premature and low birth weight babies born to moms who visited mobile clinics. O'Connell *et al.* (2010) found that this demonstrates the efficacy of mobile clinics in providing essential prenatal care to moms from underserved communities. Therefore, people who are reluctant to go to a health center for treatments and checkups may find relief in mobile clinics. It will be harder to manage an illness later on if diagnosis and treatment are delayed due to a lack of these services (Kahn *et al.* 2003).

2.4.6 Limitations of mobile health clinics

Despite widespread research in favor of mobile health clinics, others have pointed out the model's limitations (Yu *et al.* 2017). There are four distinct types of restrictions placed on mobile health clinics that have been discussed in the academic literature. the risk of care fragmentation rising: Many mobile health clinics are not yet fully integrated into the health system, making it challenging to guarantee that patients receive the level of care they need through coordinating with hospitals, supplementary services, laboratories, pharmacies, and private clinics (Campos and Olmstead -Rose 2012). Although patient referrals are an important part of any mobile clinic's success, many clinics have struggled to keep accurate records of these referrals (Edgerley *et al.* 2007). In many cases, patients were not followed up with after their referral visits because they did not show up (Alvi *et al.* 2015). Attempts have been made by certain mobile clinics, such as routinely calling patients to set up follow-up visits. While the mobile clinics concept has shown promise, there is always the issue of care fragmentation to consider (Post 2007). Budgetary concerns: Another problem with mobile clinics is the money needed to buy and maintain a reliable vehicle. Vehicle maintenance costs increase over time, which can put a strain on a mobile clinic's ability to maintain a steady revenue stream and cover rising medical

bills (Post 2007). Fifty-two percent of mobile mammography vans in a research reported financial losses as a result of mechanical issues, bad weather, and broken or stolen equipment (DeBruhl *et al.* 1996). The lack of financial resources was regarded as the most major barrier by 58% of mobile clinics, according to another study. Corporate sponsorships, cross-training of employees, routine maintenance checks, and collaboration with community organizations are just some of the methods that have been implemented to combat economic instability (Post 2007).

Constrained areas and clinical structures: Because mobile clinics operate in such a small space, spatial and structural restrictions arise. Because the layout of mobile clinics allows customers to hear private talks. Privacy is occasionally jeopardized by constructing moveable partitions within the automobile or programming patients to speak various languages simultaneously, so maintaining privacy might be difficult. (Guruge *et al.* 2010). Location limits may influence service quality as well. According to (Chen *et al.* 2016), the size of a mobile mammography unit clinic only allows for portable machines, resulting in worse intrinsic imaging quality compared to district hospitals and dissatisfaction among some clients. While mobility has distinct advantages for mobile clinics, it may also provide unique challenges. Mobile clinics rely on generators, which might fail and disrupt operations and power and temperature control (Zheng 1985). Refrigerators, for example, require consistent power sources and may be challenging to maintain in a mobile van. Some mobile clinics cannot preserve vaccinations or injectables due to low refrigeration temperatures. Because mobile clinics are always on the go, it may be challenging to maintain regular Internet connectivity, which is especially important for electronic medical records (Post 2007).

Difficulties in logistics planning: Mobile clinics' capacity to treat patients and the quality of care they provide could be hampered by logistical challenges. Recruiting and keeping culturally diverse community health professionals who are experienced in collaborative efforts, comfortable working in compact quarters, and prepared to take the hazards connected with traveling to underserved neighborhoods is a problem for 33% of mobile clinics, according to research. In densely populated locations, it may be difficult to find a safe place to park a mobile clinic for a few hours at a time. In addition, some communities

are wary of safety net clinics for fear of attracting marginalized patients like the homeless or people who inject drugs (Post 2007). The effective adoption of mobile clinic services necessitates full and community participation throughout the planning process and continuous partnerships to enable mobile clinics' consistent contact and collaboration with each area (Yu *et al.* 2017).

2.4.7 Suggestions for the development of mobile health clinics

The current literature provides a good framework for future approaches in both quantitative and qualitative analyses of the breadth and impact of mobile clinics, notwithstanding the lack of research on mobile health clinics (Gagnon *et al.* 2016). As they work to prove their worth to the healthcare system, mobile clinics face a number of obstacles. Due to their increasing prominence in today's healthcare system, mobile clinics are under increasing pressure to improve their methods for identifying and meeting the health care requirements of certain groups (Yu *et al.* 2017). Therefore, it is important to prioritize models that increase capacity and cost-effectiveness, such as reorganizing the service provider, expanding the range of services offered, and decreasing the amount spent on personnel (Campos and Olmstead-Rose 2012). In order to prove a clinic's worth in terms of service quality and cost-effectiveness, continuous research is required. To maximize the potential advantage mobile clinics may provide to various target populations and the health system, other qualitative and quantitative indicators will need to be studied (Yu *et al.* 2017).

2.5 Related Studies

Although mobile health clinics routinely provide specialized healthcare to vulnerable populations in both high- and low-income countries, evidence of their usage and utility in improving healthcare delivery is limited. Aljasir (2010) observed that 35.8% of patients were unsatisfied with the location of mobile clinics in a 2009 study on mobile clinics in rural Saudi Arabia. This highlights the need to put mobile clinics near individuals in distant areas. Research conducted in the United States (USA) reviewed data from 1500 mobile clinics and discovered that they were beneficial in reaching hard-to-reach

populations and upgrading treatment to raise awareness of the use of mobile clinics and their influence on the health system. Hill and his associates (2014) Mobile clinics are useful for screening for specific diseases, such as HIV in South Africa and cervical cancer in Thailand, as well as treating certain chronic illnesses, such as epilepsy in rural Malawi (Bassett *et al.* 2014). According to the research, mobile clinics are an important component of the health system since they serve vulnerable populations and provide high-quality care at a low cost. According to the study, mobile clinics in the United States, which has an estimated 1500 mobile clinics countrywide and receives 5 million visits each year, provide benefits such as improving access, increasing preventative and chronic illness management, and cutting expenses for underserved communities (Hill *et al.* 2014). Data analytics were utilized to assess the feasibility, volume, and type of services mobile clinics provided in Malawi to account for consumption rates. According to the findings of this study, Malaria-infected children in rural Malawi make frequent use of mobile clinics. Patient satisfaction is critical in the health care industry because physicians and nurses guarantee that patients are satisfied with their treatments (Geoffroy *et al.* 2014).

Another research (Geoffroy *et al.* 2014), investigated the feasibility, volume, and types of services provided by three mobile clinics in Malawi's Mulanje Region between 2011 and 2013. According to the findings of the cross-sectional retrospective study, mobile clinics offered primary health care services to 309-492 people in 2013, with services being given on 99% of planned days. Despite advances in service delivery, total patient visits decreased throughout the trial. Malaria and respiratory and gastrointestinal illnesses account for 60% of all visits. Women tested for HIV much more frequently ($n = 11\,543$) than men ($n = 2481$), but men tested positive for HIV more frequently (27%) than women (14%). Malaria accounts for 26 421 (35%) of all visits to children under five, significantly increased during the rainy season. Health-care barriers in rural Mozambique were explored. According to research, 1.6 million Mozambicans with HIV, and more than 60% reside in rural regions with little access to healthcare. In 2013, mobile health clinics were established in two provinces to deliver antiretroviral treatment (ART) and basic primary care services. Before bringing mobile health clinics into the communities, the researchers did a quick ethnographic assessment to understand better the barriers to HIV care, treatment, the acceptability and potential use of mobile health clinics as an alternative

service delivery mechanism. In this context, 17 individuals (57 from Gaza province and 60 from Zambezia province) were interviewed in depth. According to the research, transportation and distance difficulties (reliability, cost, and travel duration) are among the barriers to receiving health care. It has been proposed that mobile health clinics can help eliminate various hurdles to HIV care, including transportation concerns (Schwitters *et al.* 2015). Their study addresses the challenges encountered while creating mobile clinics to provide accessible and possible medical care in remote locations while providing structural, procedural, and logistical support. They provide advantages such as accessibility, service diversity, and the ability to provide health care in remote or restricted locations and during disasters. They observed that it had disadvantages, such as financial issues and a scarcity of supplies. According to the findings, mobile clinics play a vital role in providing low-cost treatment, high-quality to populations who are needed. The post-reform populations environment with greater access to historically underserved and enhanced accountability for population health management, save money by boosting mobile clinics' ability to interact with hospitals, payers, could improve treatment and health systems (Abbasi *et al.* 2016). Draw attention to health tourism, a growing market globally, and examine how mobile health services might be used in this industry. According to the research, the elderly population is rapidly rising worldwide, and the number of patients is increasing with the population's aging. It increases life expectancy, and this circumstance causes demand to surpass hospital capacity. Bektaş and Imşek highlight it as a consideration (2016). They focused their analysis on mobile health clinics in the United States. They evaluated data from 811 clinics that participated in the Mobile Health Map between 2007 and 2017 to characterize the demographic features of the clients serviced by these clinics, the services they provide, and the linked institutions and financing sources of the mobile clinics. According to data, mobile clinics in the United States provide an average of 3491 visits yearly. More than half of its customers are women (55%) and racial/ethnic minorities (59%). In the 146 clinics reporting insurance data, 41% of customers are uninsured, while 44% have public insurance. Primary care (41%) and preventive (47%) are the most widely utilized service modalities. According to the data, some mobile clinics are autonomous (33%), some are linked with a university (24%), and some (29%) are part of a hospital or health system. While most mobile clinics

get some philanthropic assistance (52%), federal money supports slightly under half (45%) (Malone *et al.* 2020).

A recent research reviewed the literature on applications are used from mobile health in Type 2 diabetes patients to offer glycemic control, increased self-management and effective lifestyle change. Between March and May 2020, the keywords "mobile health, mobile applications, diabetes self-management, type 2 diabetes, nursing," were searched in Web of Science, PubMed, CINAHL, Scopus, the Cochrane Library, Medline databases and the ULAKBM National Database (Yüksel and Bektaş 2021). The researchers looked for studies in Turkish or English that included adults over 18 years of age with type 2 diabetes and analyzed the efficacy of mobile health applications. The findings highlight the importance of mobile health applications in improving self-management abilities in people with type 2 diabetes, such as diet adherence, regular physical activity, medication requirement reduction, regular blood sugar monitoring and HbA1c; levels (Glycated hemoglobin).



3. MATERIAL METHOD

This chapter describes the research design employed, as well as the study's environment, sample selection, data collection tools and methodologies, and statistical analysis.

3.1 Design of the Study

A descriptive, cross-sectional and relational screening models study has been carried out to evaluate mobile health services in Iraq – Sinjar region, on 23th December 2021 to 1st June 2022 by applying criteria and indicators for mobile health clinics.

3.2 Setting of the study

The current study included (180) patients out of the total number of patients who received treatment through the mobile health clinics in the Sinjar region – Iraq (Appendix 9).

3.3 Location of the Study

The study was conducted in Iraq - Sinjar region during the period of 12.2021 – 06.2022, (Sinjar center, villages-rurals and camps).

3.4 Population and Sample of the Study

The population of the study consists of patients receiving treatment through mobile health clinics that are affiliated with governmental, non-governmental, and international human rights organizations under the administration of the Iraqi government.

The sample of the study was non-probability, accidental sampling. In this study, 250 patients were interviewed; 70 of them refused to participate in the study. The study sample consists of 180 patients. Study samples have been selected by their regions, as follows:

- i. Sinjar center.
- ii. Rurals (Villages) of Sinjar region.
- iii. Camps of Sinjar region.

The G*Power computer program was used for Power Analysis (Faul *et al.* 2007), with medium effect size ($\eta^2=0.265$), 80% power, and 5% type I error level, one-way analysis of Variance (ANOVA) for the purposes stated above. The test requires a sample group of at least 175 people (Appendix 8). In this framework, the study sample consisted of 180 patients selected by a convenient sampling method (Faul *et al.* 2007).

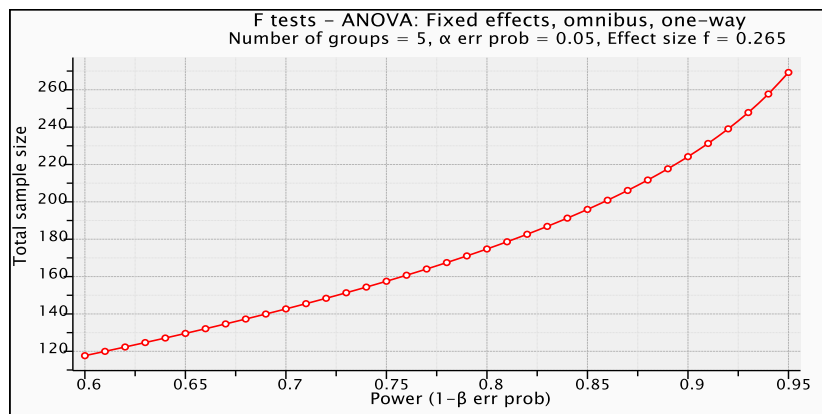
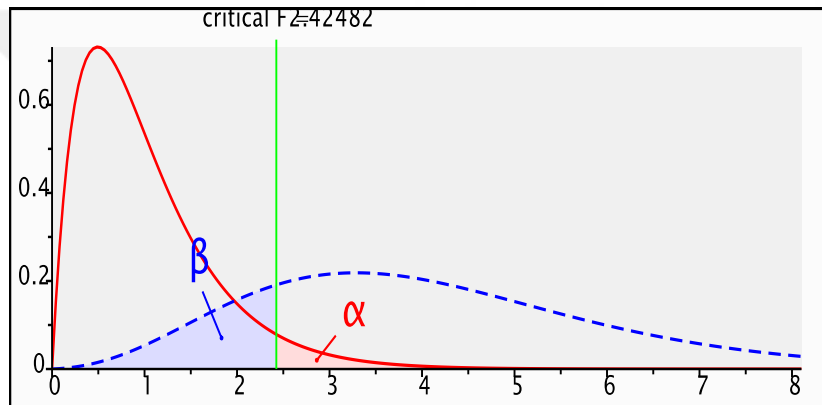


Figure 3.1 Power analysis results

3.4.1 Inclusion criteria of sample

Both genders of the patients who received treatment or supported from mobile health clinics, being 18 years of age or older, agreeing to participate in the study voluntarily, and speaking arabic.

3.4.2 Exclusion criteria of sample

Refusing to participate in the study and having a mental or psychological illness.

3.5 Tools of study

A questionnaire was created for the purpose of the study using the interview technique after an exhaustive analysis of relevant materials (Appendix 1 in Turkish language. Appendix 2 in Arabic and English languages).

The data collection form consists of two parts:

- i. The first section is Social Demographic Data and this section includes seven questions:
Age, gender, marital status, employment status, financial situation, place of residence, and presence of chronic illness.
- ii. The first part is about mobile health clinics and consists of 3 sub-sections:
 - 1- The first part consists of 22 questions: strongly agree, agree, undecided, disagree, strongly disagree. In this section, there are questions about the evaluation of health clinics, such as the difficulty of accessing mobile health clinics, their equipment, the efficiency of health personnel, the provision of training, and the follow-up of patients.
 - 2- The second part consists of 13 medical specialties. These specialties were presented to the participants, and they were asked whether these medical specialties exist among those working in mobile clinics. The answer was yes, no, I don't know.

3- The third part is in the form of writing a short paragraph for the answer. This section consists of 5 questions covering procedures, precautions, services, and reasons for visiting mobile clinics.

The researcher developed the questionnaire questions according to the research needs. Since the research is new in Iraq and no similar research has been done before, the researcher collected essential questions from different sites and articles dealing with the dimension of mobile health clinics (Al-Ani *et al.* 2018, Buis *et al.* 2019, Dol *et al.* 2019).

The researcher presented the sum of the survey questions to a committee of twelve experts at Mosul University and Nineveh University, adding some of the questions he needed in his research. Then the survey questions were approved after correction and revision (Lami *et al.* 2019, Saleh *et al.* 2018).

Another researcher cannot use the questionnaire only with the consent with permission of the principal researcher only due to the privacy of the research. Committee members have names, emails and signatures reserved exclusively for the researcher (Appendix 4).

3.6 Data Collection Method

After the conditions for participation in patients are met and the voluntary consent to collect data through a form containing the researcher's name, the research title and instructions for participation in data collection, the participating patient, writes his name and signature in the form (Appendix 3). The form is kept with the researcher only to preserve the participating patient's privacy. And then an interview technique and a questionnaire were used to collect data. The average time for data collection was 30 minutes.

3.7 Statistical Analysis

IBM SPSS 25.0 program was used for all statistical analyzes.

Descriptive statistics such as mean and standard deviation of the variables were used in the study.

Whether the scales comply with the normal distribution hypothesis was determined by looking at the skewness and kurtosis coefficients and parametric test methods were preferred.

Difference tests were used to examine the relationship between research variables and personal variables, and to compare the scores obtained from data measurement tools with demographic variables.

While examining the differentiation status of the group scores of the variables according to their personal information, the "independent sample t test" was used in the comparisons of the variables that provided the normal distribution assumption, and "ANOVA" was used in the comparisons of three or more groups.

3.8 Analysis of Data

Each and every Statistical IBM SPSS 25.0 was utilized for statistical data analysis to look at the correlation between different variables in the study. Descriptive statistical approaches were used to analyze the data, which included looking at individual variables, determining how those individual factors were related to the research variables, and comparing the results of the data measuring instruments with demographic information. It was first determined, using parametric test methods of choice, whether or not the satisfaction and knowledge levels of mobile health clinic surveys were consistent with the standard distribution hypothesis by examining the skewness and kurtosis coefficients (Table 3.1). After that, we ran an internal consistency analysis and talked about any

problems we encountered with the surveys. Following a review of the patients' demographic information, we conducted a descriptive analysis of responses to our questionnaires about our patients' experiences with our mobile health clinic and our doctors' expertise in this field. The "independent sample t-test" was used for comparisons of variables that provided the standard distribution assumption, and the "analysis of variance" was used for comparisons of three or more groups when examining the differentiation status of the group scores of the variables according to the personal information of the patients. All results were considered statistically significant when compared to a p value of 0.05.

Table 3.1 Skewness and kurtosis values of surveys

Surveys	N	Distortion	Kurtosis
Mobile Health Clinic Satisfaction Level	180	,183	,264
Mobile Health Clinic Knowledge Level	180	-,423	-,290

A normal distribution is assumed, and Seğer (2015) concludes that assessing data quality using skewness and kurtosis values is the right way to go. Must acknowledge that a normal distribution exists when the skewness and kurtosis values are within the range of 1.50 (plus or minus). Based on the results of the analyses, it was concluded that the variables followed a normal distribution (Tabachnick and Fidell 2013).

3.9 Ethical Committee approval

“Ethical approval was obtained from Çankırı Karatekin University” (Appendix 5).

The research was conducted in Iraq - Sinjar region, Depended on Ethics Approval from Ministry of Health and Environment, Nineveh Health Directorate, Training & Human, Development Center (No.: 21/199, Date 22.12.2021). Then Directed to General Sinjar Hospital to facilitate the data gathering, follow up with an assistant supervisor (Dr. Nawaf

Mohammed Dhahir) (Appendix 6), Approval of assistant supervisor from Çankırı Karatekin University (Appendix 7).

3.10 Validity of instrument

The content validity of the tool questionnaire has been determined (Evaluation of Mobile Health Clinics in the Stricken regions / Iraq – Sinjar region).

A panel of twelve experts was formed, consisting of (Three) Experts From The College of Nursing / University of Nineveh and (Nine) experts from the college of nursing / university of Mosul. The specialists had at least ten years of expertise in their respective field. The mean and standard deviation for their years of experience was (18.75). These experts were given a copy of the research instrument and asked to review and test it for material clarity and adequacy to investigate the content of the questionnaire. The researcher followed both expert recommendations. Some elements were left out after considering all of the feedback and suggestions. After making the necessary changes based on their answers, the questionnaire was deemed accurate.

3.11 Pilot study

Thirty-five patients in the Sinjar region were used in a pilot research conducted between October 1 and 15, 2021, to determine the validity of the study instrument. Study participants in the pilot phase met the same inclusion and exclusion criteria as the primary cohort. The sample used in the pilot study was not part of the primary data set.

3.12 The Purposes of pilot study

- i. To recognize any possible problems that can arise during this study.
- ii. Calculate the average time spent collecting data.
- iii. To determine if the questionnaire's contents are simple and understandable to the study's participants.

- iv. Calculate how much time each person would have to fill the instrument.
- v. To determine the questionnaire's reliability.

3.13 The Result of Pilot Study

According to the findings of the pilot study, the questionnaire was easy to understand for the participants. The amount of time it takes to complete the questionnaire was 20 to 40 minutes.



4. RESULTS OF THE STUDY

The data transferred to the computer environment were checked for missing/wrong values and outliers. The sample for the study was non-probability, accidental sampling. In this study, 250 patients were interviewed; 70 of them refused to participate in the study. The study sample consisted of 180 patients who agreed to participate in the study, selected from the universe at a significance level of 0.05 with 80% power. The study data were obtained by applying the personal information form and expressions in the mobile health clinic satisfaction level and mobile health clinic knowledge level questionnaires. The data were analyzed in this section.

4.1 Reliability Analysis

Having established that the mobile health clinic is a valuable resource for gathering information, an internal consistency study was performed on the associated measures of satisfaction and familiarity with the clinic. Cronbach's Alpha must meet the following conditions;

- If α value is $0.00 \leq \alpha < 0.40$ Not Reliable
- If $0.40 \leq \alpha < 0.60$ Low reliability
- If $0.60 \leq \alpha < 0.80$ Good reliable
- $0.80 \leq \alpha \leq 1.00$ Very high reliability.

Table 4.1 Reliability analysis findings of the questionnaires

Surveys	Cronbach's Alpha	Number of Items
Mobile Health Clinic Satisfaction Level	,748	15
Mobile Health Clinic Knowledge Level	,711	7

Among the questionnaires used in the research, the Cronbach Alpha value of the satisfaction level questionnaire for the mobile health clinic was 0.748, and the Cronbach Alpha value of the knowledge level questionnaire for the mobile health clinic was 0.711.

4.2 Evaluation of Demographic Findings

In this part of the study, the patients' characteristics who participated in the survey, gender, age, residence status, marital status, occupation, income level, and chronic disease status with Five general questions for patients participating in the study: distribution were examined, and descriptive analyses were made for their characteristics and presented in tables.

Table 4.2 Gender distribution

	Gender Status	F	%
Gender	Female	78	43,3
	Male	102	56,7
	Total	180	100,0

According to the analysis result in Table 4.2, 56.7% of the patients were male and 43.3% were female.

Table 4.3 Age distribution

	Age Status	F	%
Age Status	18-25 years old	74	41,1
	26-33 years old	30	16,7
	34-41 years old	25	13,9
	42-49 years old	33	18,3
	over 50 years old	18	10,0
	Total	180	100,0

According to the analysis results in Table 4.3, 41.1% of the patients are 18-25 years old, and 10.0% are over 50.

Table 4.4 Distribution of residence status

	Residence Status	F	%
Residence Status	Sinjar's Countryside (villages and rurals)	92	51,1
	Sinjar's Camp	49	27,2
	Sinjar's center	39	21,7
	Total	180	100,0

According to the analysis result in Table 4.4, 51.1% of the patients settled in the rural regions of Sinjar, 27.2% in the Sinjar camp, and 21.7% in the Sinjar.

Table 4.5 Marital status distribution

	Marital status	F	%
Marital status	Single	98	54,4
	Married	82	45,6
	Total	180	100,0

According to the analysis result in Table 4.5, 54.4% of the patients were single, and 45.6% were married.

Table 4.6 Occupational status distribution

	Job	F	%
Occupational Status	Worker	15	8,3
	Unemployed	101	56,1
	Retired	1	0,6
	Employer	63	35,0
	Total	180	100,0

According to the analysis result in Table 4.6, 56.1% of the patients were unemployed, and 35.0% were employers.

Table 4.7 Income level distribution

	Income rate	F	%
Income rate	Income Higher Than Spending	6	3,3
	Equivalent Income to Spending	36	20,0
	Income Less than Spending	138	76,7
	Total	180	100,0

According to the analysis result in Table 4.7, it was determined that 76.7% of the patients had less income than their expenditure.

Table 4.8 Distribution of chronic disorder status

	Chronic Ailment	F	%
Chronic Status	Yes	38	21,1
	No	142	78,9
	Total	180	100,0

According to the analysis result in Table 4.8, it was determined that 78.9% of the patients did not have a chronic disease, and 21.1% of them had a chronic disease.

Table 4.9 Frequency table the answers to the questions “what service did the mobile health clinic staff provide the most?”

Question 1	Answers	F	%
What service did the mobile health clinic staff provide the most?	Providing treatment for chronic diseases	24	13,3
	Give treatments for infections	79	43,9

	Vaccines	16	8,9
	Healing wounds and burns	14	7,8
	Providing first aid	24	13,3
	Health awareness about infectious diseases	23	12,8
	Total	180	100,0

“What service did the mobile health clinic staff provide the most?” To the question, 43.9% answered “Give treatments for infections,” 13.4% “Providing first aid,” and 13.2% “Providing treatment for chronic diseases.” (Table 4.9).

Table 4.10 Frequency table the answers to the questions “what is the main reason for your visit to the mobile health clinic?”

Question 2	Answers	F	%
What is the main reason for your visit to the mobile health clinic?	Abdominal pain	56	31,1
	Chest pain	21	11,7
	Arthritis	9	5,0
	Ear, Nose and Throat	10	5,6
	Getting injured	11	6,1
	Skin allergy	18	10,0
	Fever	19	10,5
	Dyspnea	3	1,7
	Fracture	9	5,0
	Catch a cold	24	13,3
	Total	180	100,0

“What is the main reason for your visit to the mobile health clinic?” To the question, 31.1% answered “Abdominal pain,” 13.3% “Catch a cold,” and 11.7% “Chest pain.” (Table 4.10).

Table 4.11 Frequency table the answers to the questions “What are the first actions you took when you visited the mobile health clinic?”

Question 3	Answers	F	%
What are the first actions you took when you visited the mobile health clinic?	Compliance with the instructions of the mobile health clinic	39	21,7
	Attention to personal hygiene	18	10,0
	Wear a mask and maintain social distancing	113	62,7
	I didn't any Procedures	10	5,6
	Total	180	100,0

“What are the first actions you took when you visited the mobile health clinic?” 62.8% of the respondents answered the question, “Wear a mask and maintain social distancing,” 21.7% “Compliance with the instructions of the mobile health clinic,” and 10.0% “Attention to personal hygiene.” (Table 4.11).

Table 4.12 Frequency table the answers to the questions “what are the precautions that the mobile health clinic takes for difficult cases?”

Question 4	Answers	F	%
What are the precautions that the mobile health clinic takes for difficult cases?	Referral to hospital	153	85,0
	Giving treatment and follow-up for some cases	11	6,1
	Introducing simple Procedures	16	8,9
	Total	180	100,0

When asked, "What are the precautions that the mobile health clinic takes for difficult cases?" 85.0% of the patients answered "Referral to hospital," 8.9% "Introducing simple procedures," and 6.1% "Giving treatment and follow-up for some cases." (Table 4.12).

Table 4.13 Frequency table of answers to general questions

Question 5	Answers	F	%
In your opinion, what is the most important service that should be provided mainly in the mobile health clinics?	Preventive measures such as vaccinations, etc	23	12,8
	Giving medicines for chronic diseases	30	16,7
	Care of mentally ill and physically handicapped	7	3,9
	Provide a first aid	24	13,3
	Providing medicines for various infections	96	53,3
	Total	180	100,0

“In your opinion, what is the most important service that should be provided mainly in the mobile health clinics?” To the question, 53.3% answered “Providing medicines for various infections,” 16.7% “Giving medicines for chronic diseases,” and 12.8% “Preventive measures such as vaccinations, etc.” (Table 4.13).

4.3 Descriptive Analysis Results for Variables

The variables of the research on mobile health clinics consist of satisfaction level and mobile health clinic knowledge level questionnaires. This part of the study gives descriptive statistics about the variables.

Table 4.14 Descriptive analysis results for variables

Scale	N	Min.	Max.	Average	SD
Mobile Health Clinic Satisfaction Level	180	1,00	4,27	2,57	,64
Mobile Health Clinic Knowledge Level	180	1,00	5,00	2,87	,91

The average of the answers given to the expressions of satisfaction level of the mobile health clinic by the patients included in the study was determined as $2.57 \pm .64$, the minimum score was 1.00, and the maximum score was 4.27.

The average of the answers given to the expressions of the knowledge level of mobile health clinic by the patients included in the study was determined as $2.87 \pm .91$, with a minimum score of 1.00 and a maximum score of 5.00.

Table 4.15 Level of knowledge regarding the status of taking task in the implementation of the mobile health clinic

Questions	YES		NO		I DON'T KNOW	
	F	%	F	%	F	%
Gynecologist	39	21,7	83	46,1	58	32,2
Pediatrics	74	41,1	64	35,6	42	23,3
Internal medicine	88	48,9	34	18,9	58	32,2
Orthopedist	9	5,0	83	46,1	88	48,9
Neurology	11	6,1	90	50,0	79	43,9
Ophthalmologist	15	8,3	94	52,2	71	39,4
Ear Nose Throat	34	18,9	77	42,8	69	38,3
Urology	18	10,0	69	38,3	93	51,7
General Surgery	28	15,6	78	43,3	74	41,1
Dermatology	43	23,9	70	38,9	67	37,2
Physiotherapist	28	15,6	72	40,0	80	44,4
Hematology	17	9,4	90	50,0	73	40,6
Psychologist	61	33,9	61	33,9	58	32,2

According to Table 4.15, the summary of the answers that have been given included in the study to the questions asked about whether doctors from different specialties are involved in the implementation of mobile health clinics are as follows:

- Of the patients included in the study, 48.9% stated that they "knew" that the internist was involved in the mobile health clinic, while 5.0% stated that they "knew" that the Orthopedist specialist was involved in the mobile health clinic.

- 52.2% of the patients included in the study stated that the ophthalmologist "does not take part" in the mobile health clinic, while 18.9% stated that the internist "does not take part" in the mobile health clinic.
- 51.7% of the patients in the study stated that they "do not know" whether the urologist was involved in the mobile health clinic. In contrast, the pediatrician stated that they "do not know" whether or not they took part in the mobile health clinic.

4.4 Difference Tests

In this part of the study, the differences between the average scores obtained from the variables according to the distribution of gender, age, residence status, marital status, occupation, income level, and chronic disease status with the five general questions “In your opinion, what is the service provided by the mobile health clinic staff more than others?, what is the main reason for your visit to the mobile health clinic?, what were the first actions you took when you visited the mobile health clinic?, what precautions does the mobile health clinic take for difficult cases?, and what is the most important service that must be provided primarily in mobile health clinics?,” of the patients constituting the research group will be discussed.

Table 4.16 Differentiation status of scores obtained from variables by gender

Variables	Gender Status	N	$\bar{X}$	SD	<i>t</i>	<i>p</i>
Mobile Health Clinic Satisfaction Level	Women	78	2,56	,61	-,251	,802
	Men	102	2,58	,67		
Mobile Health Clinic Knowledge Level	Women	78	2,96	,95	1,152	,251
	Men	102	2,80	,88		

According to the analysis result (See Table 4.16), the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly according to gender ($p>0.05$). In other

words, the gender status of the patients; was determined that the mobile health clinic did not affect the satisfaction level and the knowledge level of the mobile health clinic.

According to this result, "H1.1: Participants' satisfaction with mobile health clinic differs according to their gender" and "H2.1: The knowledge level of the participants about the mobile health clinic differs according to their gender" hypotheses were not accepted.

Table 4.17 Differentiation status of scores obtained from variables by age

Variables	Age Status	N	$\bar{X}$	SD	F	p
Mobile Health Clinic Satisfaction Level	18-25 years old	74	2,47	,62	,826	,510
	26-33 years old	30	2,61	,72		
	34-41 years old	25	2,69	,65		
	42-49 years old	33	2,62	,65		
	over 50 years old	18	2,68	,57		
Mobile Health Clinic Knowledge Level	18-25 years old	74	2,76	,92	,666	,616
	26-33 years old	30	2,95	,89		
	34-41 years old	25	2,87	1,01		
	42-49 years old	33	2,91	,83		
	over 50 years old	18	3,12	,93		

According to the analysis result (See Table 4.17), the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly according to their age ($p>0.05$). In other words, the age of the patients; was determined that the mobile health clinic did not affect the satisfaction level and the knowledge level of the mobile health clinic.

According to this result, "H1.2: Participants' satisfaction with the mobile health clinic differs according to their age" and "H2.2: The level of knowledge of the participants about the mobile health clinic differs according to their age" hypotheses were not accepted.

Table 4.18 Differentiation status of scores obtained from variables according to residence status

Variables	Residence Status	N	$\bar{X}$	SD	F	p
Mobile Health Clinic Satisfaction Level	Sinjar Countryside	92	2,60	,63	,480	,620
	Sinjar Camp	49	2,61	,64		
	Sinjar	39	2,49	,67		
Mobile Health Clinic Knowledge Level	Sinjar Countryside	92	2,97	,88	1,912	,151
	Sinjar Camp	49	2,87	,87		
	Sinjar	39	2,63	1,00		

According to the analysis result (See Table 4.18), the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly according to the residence status ($p>0.05$). In other words, the placement status of the patients determined that the mobile health clinic did not affect their satisfaction level and knowledge level.

According to this result, “H1.3: The satisfaction of the participants about the mobile health clinic differs according to the location” and “H2.3: The level of knowledge of the participants about the mobile health clinic differs according to the location” hypotheses were not supported.

Table 4.19 Differentiation status of scores obtained from variables according to marital status.

Variables	Marital status	N	$\bar{X}$	SD	t	p
Mobile Health Clinic Satisfaction Level	Single	98	2,54	,66	-,893	,373
	Married	82	2,62	,61		
Mobile Health Clinic Knowledge Level	Single	98	2,81	,91	-1,042	,299
	Married	82	2,95	,91		

According to the analysis result (See Table 4.19), the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly according to their marital status ($p>0.05$). In other words, the marital status of the patients; was determined that the mobile health clinic did not affect the satisfaction level and the knowledge level of the mobile health clinic.

According to this result, “H1.4: Participants’ satisfaction with the mobile health clinic differs according to their marital status” and “H2.4: The level of knowledge of the participants about the mobile health clinic differs according to their marital status” hypotheses were not supported.

Table 4.20 Differentiation status of scores obtained from variables according to occupational status

Variables	Occupation Status	N	$\bar{X}$	SD	F	p
Mobile Health Clinic Satisfaction Level	Worker	15	2,51	,62	3,449	,034
	Unemployed/Retired	102	2,48	,62		
	Employer	63	2,74	,65		
Mobile Health Clinic Knowledge Level	Worker	15	2,57	,64	7,279	,001
	Unemployed/Retired	102	2,68	,82		
	Employer	63	2,69	,94		

According to the results (See Table 4.20); satisfaction level of the mobile health clinic of the patients and the knowledge level of the mobile health clinic of the patients differs statistically significantly according to the occupational status ($p<0.05$). In other words, the profession of the patients; it was determined that the mobile health clinic affected the level of knowledge and the level of satisfaction.

According to this result, “H1.5: Participants’ satisfaction with the mobile health clinic differs according to their profession.” hypothesis was accepted; and the “H2.5: The

participants' level of knowledge about the mobile health clinic differs according to their profession.” hypothesis was accepted.

According to the analysis results in Table 4.6; It is seen that 56.1% of the participants are unemployed and 0.6% are retired. In order to obtain more accurate and meaningful results, the unemployed and retired group were combined and renamed as “Unemployed/retired”. Occupational status distribution obtained after the merger is presented in Table 4.20.

Table 4.21 Variation in the variables according to the difference between the groups

Variables	Occupation Status	Occupation Status	Mean Difference (I-J)	Std. Error	p
Mobile Health Clinic Satisfaction Level	Worker	Unemployed/ Retired Employer	,031	,175	1,000
		Employer	-,232	,182	,612
	Unemployed/ Retired Employer	Worker	-,031	,175	1,000
		Employer	-,263*	,101	,031
	Employer	Worker	,232	,182	,612
		Unemployed/ Retired Employer	,263*	,101	,031
Mobile Health Clinic Knowledge Level	Worker	Unemployed/ Retired Employer	-,014	,243	1,000
		Employer	-,537	,253	,105
	Unemployed/ Retired Employer	Worker	,014	,243	1,000
		Employer	-,523*	,141	,001
	Employer	Worker	,537	,253	,105
		Unemployed/ Retired Employer	,523*	,141	,001

It was determined that the mobile health clinic knowledge level of the employers (2.69) was higher than the unemployed/Retired (2.68) Employer patients, and this was statistically significant, see the analysis results in Table 4.20 with in Table 4.21.

It was determined that the Mobile Health Clinic Satisfaction Level of the employers (2,74) was higher than the unemployed/Retired Employer (2,48) patients, and this was statistically significant, see the analysis results in Table 4.20 with in Table 4.21.

Table 4.22 Differentiation status of scores obtained from variables by income level

Variables	Income rate	N	$\bar{X}$	SD	F	p
Mobile Health Clinic Satisfaction Level	Income Higher Than Spending	6	3,10	,38	2,403	,093
	Equivalent to Spending Income	36	2,63	,60		
	Income Less Than Spending	138	2,54	,65		
Mobile Health Clinic Knowledge Level	Income Higher Than Spending	6	3,76	,15	4,591	,011
	Equivalent to Spending Income	36	3,07	,90		
	Income Less Than Spending	138	2,78	,91		

According to the analysis result (See Table 4.22); while the satisfaction level of the mobile health clinic of the patients included in the study does not differ statistically according to the income level ($p>0.05$), the knowledge level of the mobile health clinic of the patients differs statistically significantly according to the income level ($p<0.05$).

It was determined that the mobile health clinic knowledge level of the patients with high income status (3,76) was higher than those with low income status (2,78), and this situation was statistically significant. In other words, the income level of the patients; while the mobile health clinic did not affect the level of satisfaction, it was determined that it affected the level of knowledge.

According to this result, the "H1.6: Participants' satisfaction with the mobile health clinic differs according to their income" and the "H2.6: participants' knowledge level about the mobile health clinic differs according to their income" hypotheses were accepted.

Table 4.23 Variation in the variables according to the difference between the groups

Variables	Income Status	Income Status	Mean Difference (I-J)	Std. Error	p
Mobile Health Clinic Knowledge Level	Income Higher Than Spending	Equivalent to Spending Income	,690	,394	,243
		Income Less Than Spending	,980*	,372	,028
	Equivalent to Spending Income	Income Higher Than Spending	-,690	,394	,243
		Income Less Than Spending	,290	,167	,253
	Income Less Than Spending	Income Higher Than Spending	-,980*	,372	,028
		Equivalent to Spending Income	-,290	,167	,253

It was determined that the mobile health clinic knowledge level of the patients with high income status (3,76) was higher than those with low income status (2,78), and this situation was statistically significant, see the analysis results in Table 4.22 with in Table 4.21.

Table 4.24 Differentiation of scores obtained from variables according to chronic disorder status

Variables	Chronic Ailment	N	$\bar{X}$	SD	t	p
Mobile Health Clinic Satisfaction Level	Yes	38	2,54	,65	-,406	,685
	No	142	2,58	,64		

According to the analysis result (See Table 4.24), the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly according to the chronic illness

($p>0.05$). In other words, the chronic discomfort status of the patients; was determined that the mobile health clinic did not affect their satisfaction level and knowledge level of the mobile health clinic.

According to this result, "H1.7: Participants' satisfaction with the mobile health clinic differs according to their chronic illness" and "H2.7: The level of knowledge of the participants about the mobile health clinic differs according to their chronic illness" were not accepted.

Table 4.25 Differentiation of scores obtained from variables according to “what service did the mobile health clinic staff provide the most?”

Variables	What service did the mobile health clinic staff provide the most?	N	$\bar{X}$	SD	F	p
Mobile Health Clinic Satisfaction Level	Providing treatment for chronic diseases	24	2,79	,47	2,437	,037
	Give treatments for infections	79	2,42	,72		
	Vaccines	16	2,51	,70		
	Healing wounds and burns	14	2,90	,49		
	Providing first aid	24	2,65	,51		
	Health awareness about infectious diseases	23	2,66	,57		
Mobile Health Clinic Knowledge Level	Providing treatment for chronic diseases	24	3,15	,77	1,143	,339
	Give treatments for infections	79	2,76	1,01		
	Vaccines	16	2,69	1,13		
	Healing wounds and burns	14	3,16	,69		
	Providing first aid	24	2,89	,80		
	Health awareness about infectious diseases	23	2,91	,70		

According to the results (See Table 4.25); while the satisfaction level of the mobile health clinic of the patients included in the study differs statistically according to the “What service did the mobile health clinic staff provide the most?” ($p<0.05$), the knowledge level of the mobile health clinic of the patients does not differ statistically significantly according to the “What service did the mobile health clinic staff provide the most?”

($p > 0.05$). Healing wounds and burns have a significantly higher mean score (2,90) than other answers.

According to this result, “H1.7: Participants’ satisfaction with the mobile health clinic differs according to “What service did the mobile health clinic staff provide the most?.” was accepted; and “H2.7: The participants' level of knowledge about the mobile health clinic differs according to “What service did the mobile health clinic staff provide the most?” hypothesis was not accepted.

Table 4.26 Variation in the variables according to the difference between the groups

Variables	What service did the mobile healthclinic staff provide the most?	What service did the mobile healthclinic staff provide the most?	Mean Difference (I-J)	Std. Error	p
Mobile Health Clinic Satisfaction Level	Providing treatment for chronic diseases	Give treatments for infections	,372*	,147	,012
		Vaccines	,283	,203	,164
		Healing wounds and burns	-,104	,211	,625
		Providing first aid	,144	,182	,427
		Health awareness about infectious diseases	,137	,183	,458
	Give treatments for infections	Providing treatment for chronic diseases	-,372*	,147	,012
		Vaccines	-,089	,172	,607
		Healing wounds and burns	-,476*	,182	,010
		Providing first aid	-,228	,147	,122
		Health awareness about infectious diseases	-,236	,149	,116
	Vaccines	Providing treatment for chronic diseases	-,283	,203	,164

		Give treatments for infections	,089	,172	,607
		Healing wounds and burns	-,387	,230	,095
		Providing first aid	-,139	,203	,495
		Health awareness about infectious diseases	-,147	,205	,474
	Healing wounds and burns	Providing treatment for chronic diseases	,104	,211	,625
		Give treatments for infections	,476*	,182	,010
		Vaccines	,387	,230	,095
		Providing first aid	,248	,211	,243
		Health awareness about infectious diseases	,240	,213	,261
	Providing first aid	Providing treatment for chronic diseases	-,144	,182	,427
		Give treatments for infections	,228	,147	,122
		Vaccines	,139	,203	,495
		Healing wounds and burns	-,248	,211	,243
		Health awareness about infectious diseases	-,008	,183	,966
	Health awareness about infectious diseases	Providing treatment for chronic diseases	-,137	,183	,458
		Give treatments for infections	,236	,149	,116
		Vaccines	,147	,205	,474
		Healing wounds and burns	-,240	,213	,261
		Providing first aid	,008	,183	,966

It was determined that the satisfaction levels of the patients who received Wound and Burn Treatment (2.90) from the mobile health center were higher than those who received Infection Treatment (2.42) and Chronic Disease Treatment (2.79), and this situation should be statistically significant, see the analysis results in Table 4.25 with in Table 4.26.

Table 4.27 Differentiation of scores obtained from variables according to “what is the main reason for your visit to the mobile health clinic?”

Variables	What is the main reason for your visit to the mobile health clinic?	N	$\bar{X}$	SD	F	p
Mobile Health Clinic Satisfaction Level	Abdominal pain	56	2,63	,66	1,148	,332
	Chest pain	21	2,48	,44		
	Arthritis	9	2,24	,70		
	Ear, Nose and Throat	10	2,78	,50		
	Getting injured	11	2,52	,50		
	Skin allergy	18	2,33	,55		
	Fever	19	2,53	,60		
	Dyspnea	3	2,40	,53		
	Fracture	9	2,78	,73		
	Catch cold	24	2,76	,85		
Mobile Health Clinic Knowledge Level	Abdominal pain	56	2,85	,96	,577	,814
	Chest pain	21	2,77	,74		
	Arthritis	9	2,97	,98		
	Ear, Nose and Throat	10	3,17	,61		
	Getting injured	11	2,71	,93		
	Skin allergy	18	2,56	,68		
	Fever	19	2,95	1,10		
	Dyspnea	3	3,24	1,53		
	Fracture	9	3,06	,95		
	Catch cold	24	2,98	,97		

According to the analysis result (See Table 4.27), the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly according to the question “What is the main reason for your visit to the mobile health clinic?” ($p>0.05$). In other words, the question “What is the main reason for your visit to the mobile health clinic?” was determined that the mobile health clinic did not affect the satisfaction level and the knowledge level of the mobile health clinic.

According to this result, “H1.7: Participants’ satisfaction with the mobile health clinic differs according to “What is the main reason for your visit to the mobile health clinic?” and “H2.7: The level of knowledge of the participants about the mobile health clinic differs according to “What is the main reason for your visit to the mobile health clinic?” hypotheses were not supported.

Table 4.28 Differentiation status of scores obtained from variables according to “What are the first actions you took when you visited the mobile health clinic?”

Variables	What are the first actions you took when you visited the mobile health clinic?	N	$\bar{X}$	SD	F	p
Mobile Health Clinic Satisfaction Level	Compliance with the instructions of the mobile health clinic	39	2,60	,60	,841	,473
	Attention to personal hygiene	18	2,39	,50		
	Wear a mask and maintain social distancing	113	2,61	,69		
	I didn't any Procedures	10	2,41	,49		
Mobile Health Clinic Knowledge Level	Compliance with the instructions of the mobile health clinic	39	2,97	,88	1,127	,340
	Attention to personal hygiene	18	2,53	1,11		
	Wear a mask and maintain social distancing	113	2,91	,89		
	I didn't any Procedures	10	2,73	,83		

According to the analysis result (See Table 4.28), the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly according to “What are the first actions you took when you visited the mobile health clinic?” ($p>0.05$). In other words, the question “What are the first actions you took when you visited the mobile health clinic?” was determined that the mobile health clinic did not affect the satisfaction level and the knowledge level of the mobile health clinic.

According to this result, “H1.7: Participants’ satisfaction with the mobile health clinic differs according to “What are the first actions you took when you visited the mobile health clinic?” and “H2.7: The level of knowledge of the participants about the mobile health clinic differs according to “What is the main reason for your visit to the mobile health clinic?” hypotheses were not supported.

Table 4.29 Differentiation status of scores obtained from variables according to “what are the precautions that the mobile health clinic takes for difficult cases”

Variables	What are the precautions that the mobile health clinic takes for difficult cases	N	$\bar{X}$	SD	F	P
Mobile Health Clinic Satisfaction Level	Referral to hospital	153	2,57	,65	,877	,418
	Giving treatment and follow-up for some cases	11	2,39	,42		
	Introducing simple Procedures	16	2,73	,68		
Mobile Health Clinic Knowledge Level	Referral to hospital	153	2,86	,91	1,418	,245
	Giving treatment and follow-up for some cases	11	2,57	,88		
	Introducing simple Procedures	16	3,16	,88		

According to the analysis result (See Table 4.29), the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly according to “What are the precautions that the mobile health clinic takes for difficult cases” ($p>0.05$). In other words, the question “What are the precautions that the mobile health clinic takes for difficult cases?”

was determined that the mobile health clinic did not affect the satisfaction level and the knowledge level of the mobile health clinic.

According to this result, “H1.7: Participants’ satisfaction with the mobile health clinic differs according to “What are the precautions that the mobile health clinic takes for difficult cases?” and “H2.7: The level of knowledge of the participants about the mobile health clinics differs according to “What are the precautions that the mobile health clinic takes for difficult cases?” hypotheses were not supported.

Table 4.30 Differentiation status of scores obtained from variables according to “In your opinion, what is the most important service that should be provided mainly in the mobile health clinics?”

Variables	In your opinion, what is the most important service that should be provided mainly in the mobile health clinics	N	$\bar{X}$	SD	F	p
Mobile Health Clinic Satisfaction Level	Preventive measures such as vaccinations,etc	23	2,69	,64	,493	,741
	Giving medicines for chronic diseases	30	2,66	,69		
	Care of mentally ill and physically handicapped	7	2,57	,31		
	Provide a first aid	24	2,56	,55		
	Providing medicines for various infections	96	2,52	,67		
Mobile Health Clinic Knowledge Level	Preventive measures such as vaccinations,etc	23	2,91	,90	,846	,498
	Giving medicines for chronic diseases	30	2,66	,91		
	Care of mentally ill and physically handicapped	7	3,31	,71		
	Provide a first aid	24	2,92	,86		
	Providing medicines for various infections	96	2,89	,94		

According to the analysis result (See Table 4.30), the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly according to “In your opinion, what is the most important service that should be provided mainly in the mobile health clinics?” ($p>0.05$).

In other words, the question “In your opinion, what is the most important service that should be provided mainly in the mobile health clinics?” was determined that the mobile health clinic did not affect the satisfaction level and the knowledge level of the mobile health clinic.

According to this result, “H1.7: Participants’ satisfaction with the mobile health clinic differs according to “In your opinion, what is the most important service that should be provided mainly in the mobile health clinics?” and H2.7: “The level of knowledge of the participants about the mobile health clinic differs according to “In your opinion, what is the most important service that should be provided mainly in the mobile health clinics?” hypotheses were not supported.

Table 4.31 Hypothesis evaluation

Variables	H1: Participants' satisfaction with the mobile health clinic differs according to their demographic characteristics	H2: The knowledge level of the participants about the mobile health clinic differs according to their demographic characteristics.
Gender	X	X
Age	X	X
Residence Status	X	X
Marital Status	X	X
Job	√	√
Income	X	√
Chronic Ailment	X	X
What service did the mobile health clinic staff provide the most?	√	X
What is the main reason for your visit to the mobile health clinic?	X	X
What are the first actions you took when you visited the mobile health clinic?	X	X
What are the precautions that the mobile health clinic takes for difficult cases?	X	X
In your opinion, what is the most important service that should be provided mainly in the mobile health clinics?	X	X

X: Reject, √: Accept

Table (4.31) shows the differences in participants' satisfaction with the mobile health clinic and participants' level of knowledge about the mobile health clinic according to their demographic characteristics.

5. DISCUSSION

The main aim of this study was to determine the level of satisfaction with the services provided by the mobile health clinics and health centers according to the demographic characteristics of the participants. In the study, the differences between the average scores obtained from the variables according to the gender, age, residence status, marital status, occupation, income level, and chronic disease status distributions of the patients were evaluated. In addition to general questions (What service did the mobile health clinic staff provide the most?, what is the main reason for your visit to the mobile health clinic?, what are the first actions you took when you visited the mobile health clinic?, what are the precautions that the mobile health clinic takes for difficult cases, and what is the most important service that should be provided mainly in the mobile health clinics?). It was determined that the satisfaction of the patients from the mobile health clinics was moderate.

During the design phase of the study, seven hypotheses were proposed. Only 2 of the 7 hypotheses was accepted (income and occupation), Applicants reported high levels of satisfaction with mobile health services in one study (Patro et al. 2008). They looked examined how people felt about mobile health clinics and how satisfied they were with the treatments they received. Patients' responses to the study's questions about their happiness with and familiarity with the study's mobile health clinic indicated that, on average, they were satisfied with and knowledgeable about the clinic. The majority of patients (64.2%) who used mobile clinics in rural Saudi Arabia in 2009 were pleased with the service they received, according to a study by Aljasir and Alghamdi (2010). As Attipoe-Dorcoo et al. (2020) point out, mobile health clinic programs in the United States perform an undervalued but crucial role in the health system by giving those who are homeless or otherwise marginalized access to medical care. It is imperative, and can be done affordably, to emphasize the role that mobile healthcare delivery programs play in effectively serving marginalized populations throughout pandemics (Hill et al. 2014). The study's conclusion was that the majority of mobile clinic patients were unemployed rural dwellers with low-to-moderate incomes.

The original intent of these kinds of mobile clinics is fulfilled in this case. These mobile clinics were developed to better provide primary healthcare to people living in outlying and rural locations (Aljasir and Alghamdi 2010). Abbasi et al. (2016) state that setting up mobile health clinics is done so as to serve disadvantaged populations in rural places far from traditional medical institutions. Healthcare for the poor, the mentally ill, immigrants, and addicts is made more accessible through mobile clinics (Collinson and Ward 2010). Research by Malone et al. found that mobile clinics in the United States saw an annual average of 3491 patients, with over half (55%) of patients being female and over a third (41%) of patients from racial/ethnic minorities lacking health insurance. Aljasir and Alghamdi (2010) report that in Saudi Arabia, one-third of those seeking care in mobile clinics cannot read or write, and that even more than two-thirds of those seeking care are without steady employment. Mobile clinics, as evidenced by the demographics of the study population, deliver medical care to remote and underprivileged communities. Another study, by Attipoe- Dorcoo et al. (2020), confirms these findings by highlighting the adaptability of mobile health clinics in the face of destroyed or inadequate health infrastructure. Urban and rural places alike can benefit from this time-tested approach to providing essential services to their residents. They claim they help those who would otherwise fall through the cracks of the health care safety net.

As stated by (Lien *et al.* 2014), mobile clinics are ideally suited for emergency medical aid due to their portability, ability to reach people who have been uprooted or isolated, and adaptability in the context of a healthcare system that has been devastated. As a result, mobile clinics have been around for quite some time, making them a tried-and-true method of providing medical care to disadvantaged communities in both urban and rural settings (Hill *et al.* 2014). However, in this study the research found that 56.7% of mobile clinic applicants were male. Aljasir and Alghamdi (2010), one of the few research supporting this finding, reports that cultural factors lead to a preponderance of male applicants to mobile clinics in Saudi Arabia. Data from the literature (Geoffroy *et al.* 2014, Malone *et al.* 2020) suggests that women are more likely to apply to work at mobile clinics. According to the research (Patro *et al.* 2008), women were more likely to apply to mobile health clinics. Women who might have traveled to the primary health center to receive services from female health professionals may have been dissuaded from doing

so due to cultural barriers that discourage them from doing so except in cases of emergency and the fact that male personnel predominantly administer the clinics.

The group average for patient satisfaction with their mobile health clinic and knowledge of their mobile health clinic is calculated by averaging the individual scores obtained from the variables according to the distribution of gender, age, residence status, marital status, occupation, income level, and chronic disease status among the patients making up the research group. There was no statistically significant difference in performance between the sexes. Studies examining patients' reactions to mobile medical clinics have yielded conflicting findings. One of these research (Cengiz 2014) indicated that there was no correlation between male and female participants' familiarity with or approval of mobile family medicine. This finding agrees with the research findings as well. While women were more content with the primary care mobile family identity model than males, this was not the case for men (Bulut 2014). In addition, (Patro *et al.* 2008) note that women are more likely to apply to mobile health clinics despite a lack of satisfaction among female patients with the care they receive.

Ali (2021) used data from Egypt to find that males were more satisfied with health insurance offices and mobile health services than females were. According to the results, there was no significant difference in patient satisfaction or knowledge across age groups at the mobile health clinic. This conclusion is supported by the findings of a study (Söyleyici 2010), which revealed no correlation between patient age or level of knowledge about mobile health services and satisfaction with mHealth services. Age, knowledge, and happiness with mobile family medicine were not determined to be significant factors by Cengiz (2014). No significant differences in group mean scores were found between residency status and satisfaction with the mobile health clinic or understanding of its services.

Interestingly, Aljasir and Alghamdi (2010) discovered the opposite: that people living in coastal areas were more satisfied with and learned more from mobile clinic services than people living in mountainous areas. According to Gibson *et al.* (2014), mobile clinic services can only be effective if they visit patients in their homes. Researchers in Kuala

Lumpur found that the reach of mobile clinics is constrained by factors including patient volume and the difficulty of getting to the clinic. The study found that neither the average degree of satisfaction with the mobile health clinic nor the average level of knowledge about the mobile health clinic varied significantly by marital status. Cengiz's (2014) research findings are consistent with this conclusion as well. According to the aforementioned research, married individuals do not have a distinct advantage when it comes to mobile family medicine practice knowledge, or patient happiness.

In a similar study, Söyleyici (2010) reports that there is no distinction between married and unmarried individuals with regards to their degree of awareness of and satisfaction with mobile family medicine. According to the results, patients of different professions reported similar levels of satisfaction with the services provided by the mobile health clinic. Söyleyici's (2010) research backs up this conclusion, finding that satisfaction with telehealth services for families is high across all occupations. The study found that the average group scores on the knowledge level of the mobile health clinic varied with profession. Therefore, businesses have better access to data on health care services provided by mobile clinics.

It is believed that businesses now have more information about their legal responsibility to protect employee health, as well as about the use of mobile health clinics to do so in a way that does not interfere with normal business operations. Cengiz (2014) cites research showing that individuals' familiarity with mobile health services varies by occupation. Patients of all socioeconomic backgrounds were found to be equally satisfied with the mobile health clinic. However, Söyleyici (2010) finds a correlation between wealth and happiness with their mobile family doctor's office. It was shown that there was a significant difference in mean group scores for knowledge at a mobile health clinic between those of different income brackets. Those with a positive net income have been found to be better informed than those who visit the mobile health clinic. Nair et al. (2021) draw a similar conclusion, arguing that low-income individuals are unable to pay for necessary medical care such as checkups and prescriptions. Free medication for all patients is one way that mobile health clinics strive to address this issue and boost

satisfaction among their clientele. The study concludes that low-income people are more likely to use and be satisfied with mobile health clinics.

It is hypothesized that as people's disposable wealth grows, their willingness to explore new avenues of knowledge grows alongside it. Those who have more disposable income than they do spending power will therefore have more knowledge than the mobile health clinic. Last but not least, the study found that there was no correlation between the patients' degree of happiness with the mobile health clinic and their level of awareness about the clinic. This finding is supported by Cengiz's (2014) study. According to this study, having a chronic illness was not associated with lower levels of knowledge or happiness.

The satisfaction level of the mobile health clinic of the patients included in the study differs statistically according to the question, "What service did the mobile health clinic staff provide the most?" Healing wounds and burns have a significantly higher mean score than other answers. While the knowledge level of the mobile health clinic of the patients does not differ statistically significantly (Yu *et al.* 2017). The study found, the number of patients with burns and wounds who visited the mobile health clinics was much less than the rest of the diseases because the supplies required to treat wounds and burns are not sufficient. In other words, the mobile health clinic treats simple cases only. refers to this meaning Garcia et al. in they research 2018, access to care for pediatric burns remains a major public health problem in the United States. Telemedicine has an opportunity to improve access to care, but current models are expensive and inefficient (Garcia *et al.* 2018).

The satisfaction and the level of knowledge of participants with the mobile health clinic differs according to the main reason for visit to the mobile health clinic. Consistent with the meaning of the study, mobile health clinics represent an underutilized resource that could transform the way healthcare is delivered, especially in underserved areas. Their value lies primarily in their mobility, their ability to be flexibly deployed and customized to fit the evolving needs of populations and health systems, and their ability to link clinical and community settings (Aung *et al.* 2015).

According to the first actions the participants took when they visited the mobile health clinics, 62.8% of the participants answered the question, “wear a mask and maintain social distancing.” There are no supportive studies for these results, the reason for wearing a mask is because the research was conducted during the period of the spread of the Corona virus, and it was considered one of the most important measures that a patient could take (Wang *et al.* 2021). The satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly.

The study found that the 85.0% of the participants answered precautions that the mobile health clinic takes for difficult cases, it is Referral to hospital. This result is consistent with a study (Tzartzas *et al.* 2019) about referring patients with difficult cases to hospitals and specialized medical units.

In this study found, 53.3% of the participants answered “Providing medicines for various infections”, 16.7% “Giving medicines for chronic diseases” and 12.8% “Preventive measures such as vaccinations”, it is most important service that should be provided mainly in the mobile health clinics. Their answers are consistent with the study conducted on these drugs. These drugs have saved millions of lives from infections that would previously have been fatal (Gajdács and Albericio 2019). According to the analysis result, the satisfaction level and the knowledge level of the mobile health clinic, the patients included in the study do not differ statistically significantly.

Two-thirds and four-fifths of patients admitted to curative services that treat minor ailments five days a week, and prenatal and twice-weekly vaccination services of private clinics, respectively, in a study evaluating the perception of society and customer satisfaction towards primary health care services provided by mobile health clinics (Patro *et al.* 2008). Three of them are content with the mobile health services they have received. To conclude, these findings do not support the null hypothesis that participants’ demographic characteristics influence their level of satisfaction with the mobile health clinic, and they provide partial support for the null hypothesis that participants’

demographic characteristics influence their level of knowledge about the mobile health clinic.

It is suggested that research into the health outcomes of people in similar settings be conducted. Patients at 10 mobile health clinics in the Sinjar region of Iraq are the only ones studied. Only secondary sources and values measured by the researcher's own interview form were used in the study.



6. CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

When the personal characteristics of the patients included in the questionnaire were examined, 56.7% of the patients were male, 41.1% were 18-25 years old, 51.1% were in the rural regions of Sinjar, 54.4% were single, 56.1% were unemployed, 76.7% It was determined that the income of the children was less than the expenditure and 78.9% of them did not have a chronic disease, 43.9% answered "Give treatments for infections;" 62.8% of the respondents "Wear a mask and maintain social distancing;" 85.0% answered "Referral the difficult cases to hospital;" 53.3% answered "Providing medicines for various infections."

Considering the differences between the average scores obtained from the variables according to the distribution of gender, age, marital status, residence status, occupation, income level, and chronic disease status of the patients, in addition to the five general questions in the research group:

In the evaluation made according to the gender status of the patients, it was determined that there was no significant difference between the satisfaction level of the mobile health clinic and the mean score of the knowledge level group of the mobile health clinic. In the evaluation made according to the age of the patients, it was found that the mean score of the mobile health clinic satisfaction level and the mobile health clinic knowledge level group was not significant. In the evaluation made according to the location of the patients, it was determined that there was no difference between the satisfaction level of the mobile health clinic and the mean score of the knowledge level group of the mobile health clinic. In the evaluation made according to the marital status of the patients, it was determined that there was no difference between the satisfaction level of the mobile health clinic and the mean score of the knowledge level group of the mobile health clinic.

In the t-test performed according to the profession of the patients, it was revealed that satisfaction level of the mobile health clinic of the patients and the knowledge level of

the mobile health clinic of the patients differs statistically significantly according to the occupational status. In the difference test performed according to the income level of the patients, it was determined that while the group average scores of the satisfaction level of the mobile health clinics did not differ, the group average scores of the knowledge level of the mobile health clinics differed.

In the difference test performed according to the chronic disease status of the patients, no significant difference was found between the satisfaction level of the mobile health clinic and the mean scores of the knowledge level of the mobile health clinic.

In the difference test performed according to “What service did the mobile health clinic staff provide the most?” while the satisfaction level of the mobile health clinic of the patients included in the study differs statistically but the knowledge level of the mobile health clinic of the patients does not differ statistically significantly.

In the difference test performed according to “What is the main reason for your visit to the mobile health clinic?” the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly. In the difference test performed according to “What are the first actions you took when you visited the mobile health clinic?” the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly. In the difference test performed according to “What are the precautions that the mobile health clinic takes for difficult cases” was determined that the mobile health clinic did not affect the satisfaction level and the knowledge level of the mobile health clinic. In the difference test performed according to “In your opinion, what is the most important service that should be provided mainly?” the satisfaction level of the mobile health clinic and the knowledge level of the mobile health clinic of the patients included in the study do not differ statistically significantly.

6.2 Recommendations

In order to encourage more women to use mobile clinics, it is suggested that more female health workers be hired to remove some of the hurdles that prevent them from doing so. It is suggested that mobile clinic hours be extended until later in the day to accommodate men who may need to come pick up their wives or daughters from school because of cultural norms requiring women to be accompanied by a man in countries like Iraq.

Mobile health clinics should be promoted more, according to experts in the field. However, mobile clinics should prioritize preventative and curative care. It is clear from the participants' feedback that there is room for improvement in the quality and breadth of services provided and that there should be an ongoing method for gauging customer satisfaction and soliciting feedback on how to make those services better. Future researchers are urged to perform more studies with larger sample groups in this area to see which aspects applicants are most satisfied with and where they get their data.

Health authorities recommend more promotion of mobile health clinics. On the other hand, mobile clinics should give importance to curative services, preventive and advocated for increased awareness of mobile clinics due to the benefits that serve the community.

Planners and decision-makers in the health sector should think about the potential of mobile clinics to deliver high-quality health care in some locations, while keeping in mind that these clinics are not intended to be long-term replacements for fixed health facilities. Rapid repair and constant review of service quality are essential for optimizing service delivery.

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APPENDICES

APPENDIX 1. Questionner (Turkish)

APPENDIX 2. Questionnaire (Arabic and English)

APPENDIX 3. Patient consent form to participate in the survey (in Arabic and English languages)

APPENDIX 4. Names of who agreed (questions of the questionnaire) (English)

APPENDIX 5. Ethics committee approval from Çankırı Karatekin University

APPENDIX 6. Research committee decision / Iraq (by Turkish and Arabic languages)

APPENDIX 7. Aproval of assistant supervisor from Çankırı Karatekin University (Turkish)

APPENDIX 8. Power analysis protocol

APPENDIX 9. Photos of Sinjar region - Iraq

APPENDIX 10. Edited certificate

APPENDIX 1. Questionnaire (Turkish)



APPENDIX 2. Questionnaire (Arabic)









Questionnaire (English)









APPENDIX 3. Patient consent form to participate in the survey (Arabic)



Patient consent form to participate in the survey (English)



APPENDIX 4. Names of who agreed (questions of the questionnaire) (English)



**APPENDIX 5. Ethics committee approval from Çankırı Karatekin University
(Turkish)**





APPENDIX 6. Research committee decision / Iraq (Turkish)



Research committee decision / Iraq (Arabic)



**APPENDIX 7. Aproval of assistant supervisor from Çankırı Karatekin University
(Turkish)**



APPENDIX 8. Power analysis protocol



APPENDIX 9. Some photos of Sinjar region - Iraq

Sinjar province center



Some of the countryside (Villages and Rural areas) of Sinjar region



Camps belonging to the displaced people from Sinjar region



APPENDIX 10. Edited certificate



CURRICULUM VITAE (CV)

Name-Surname

Place and date of birth

Contact address and phone :

Language Skills:

	READ	WRITE	SPEAK	UNDERSTAND
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English:

Arabic:

Turkish:

Education and Academic Degrees :

-

Experience :

-

-

-

-

Activities :

-

-

Scientific Study Areas:

Certificates :

-

-

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