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# The Success of the Republic of Turkey in Preventing COVID-19 Pandemic within the First 45 Days

Birkan TAPAN<sup>1</sup>  
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## ABSTRACT

The new coronavirus emerged in Wuhan, China in December 2019. The first case in Turkey was recorded on March 11, 2020. As of April 25, 2020, approximately 3 million people were infected, and more than 200,000 people around the world were killed. The number of cases in Turkey has started to reach a plateau earlier than other countries such as the United States of America, China, Italy, France, the United Kingdom and Germany. According to the statement presented by Ministry of Health in the Republic of Turkey, the daily number of recovered patients has surpassed the number of newly diagnosed patients 45 days after the beginning of the epidemic.

This study aims to review the actions and measures taken by the Republic of Turkey between March 11, 2020, the date of the first COVID-19 case emerged and April 25, 2020, 45 days after the beginning of the outbreak. Besides, the current study evaluates the health policies and the consequences based on the literature on health care policy.

**Keywords:** Health Policies, Policy-Making, Covid-19, Health Management

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## INTRODUCTION

On December 31, 2019, 27 cases of pneumonia of unknown etiology were detected in Wuhan City, Hubei Province, China (Cheng and Shan, 2020). Wuhan is the most crowded city in the center of China, with a population of more than 11 million people. These cases mostly were applied to health institutions with clinical symptoms such as dry cough, shortness of breath, fever and bilateral pulmonary infiltrates as shown by chest radiographies. All of the cases had a history of visiting Wuhan's Huanan Seafood Wholesale Market, a fish market that also consists of a variety of living animal species such as snakes, bats, marmots and poultry (Cheng and Shan, 2020). On January 7, 2020, after collecting throat swab specimens from clinically suspicious patients, China Center of Disease Control Center (CCDC) identified the causative agent as Severe Acute Respiratory Syndrome-Corona virus 2-SARS-CoV-2). World Health Organization (WHO) named the disease as COVID-19.

On January 12, 2020, 70 more samples were collected for testing from wildlife stores in the seafood market. By using Polymerase Chain Reaction (PCR) method, 33 of 585 samples were detected as 2019-nCoV positive, and the virus was isolated from positive samples. This data suggested that the origin of the virus was from wild animals. However, as the first reported case occurred on December 1, 2019, it has been suggested that the first human infection may have occurred in November 2019 and the source of novel COVID-19 could be another place than Wuhan (Lucey, 2020, Pascarella et al., 2020).

On January 30, 2020, WHO declared the COVID-19 epidemic as a public health emergency of international concern (PHEIC) for countries with high risk and inadequate health system. The emergency committee stated that early detection, isolation and non-contact might be effective against the spread of COVID-19. The primary purpose was to minimize the economic impact of the virus and not cause false information on a global scale (Jee, 2020, WHO, 2020b).

On January 31, 2020, Chinese National Health Commission announced that there were 15,238 suspected cases, 9,692 confirmed cases, 213 people were dead, and 171 patients were treated and recovered (Cheng and Shan, 2020). As of April 24, 2020, 82,804 people were detected with coronavirus in China, 77,257 people have recovered, and 4,632 people have died due to complications related to coronavirus (Worldometers, 2020). Only a few new cases have

been detected in the country since then, and it was reported that the number of coronavirus-related deaths is reduced.

As of April 24, 2020, the virus was seen in more than 180 countries including a cruise ship located in Japan (Diamond Princess) and the total number of cases was more than 2.8 million when 195,812 people died (Russell et al., 2020, Worldometers, 2020). Up to date, most patients infected with SARS-CoV-2 have developed mild symptoms such as fever, sore throat and dry cough. However, some patients have developed some fatal complications such as Acute Respiratory Distress Syndrome (ARDS), septic shock, organ failure, pulmonary edema and severe pneumonia (Del Rio and Preeti, 2020). Approximately half of the cases infected with SARS-CoV-2 is older than 56 years of age. In particular, older patients with multiple comorbidities (accompanying diseases) such as cerebrovascular, cardiovascular, respiratory, endocrine, and digestive system diseases need more intensive care support (Fei et al., 2020). Mortality rates in people older than 60 years and above are 8.8% higher than patients under 60 years of age. The countries where the epidemic increased in terms of the number of cases include the world's largest economies such as the USA, Italy, Spain, Germany, and France. As of April 2020, countries with the highest mortality rate have been recorded as the USA, the UK, Italy, Spain, France and Brazil. Turkey was ranked as number 13 (Worldometers, 2020).

In order to elaborate on the underlying mechanism of COVID-19, the European Union (EU) has mobilized approximately € 500 million to contribute to the development of treatment methods, vaccines, medical test systems and diagnostic tests (European Response, 2020).

Some companies established in the USA, such as Co-Diagnostics and Novacyt's molecular diagnostic division have started delivering the first batches of COVID-19 tests (Novacyt, 2020). In addition, the UK government invested £ 20 million in the process of developing the COVID-19 vaccine and first human trials of COVID-19 vaccine have been conducted in Oxford with the contributions of Elisa Granato who is the first patient accepting to be injected (Sharpe et al., 2020, Walsh, 2020).

## **Comparison of Countries Affected by The Pandemic in The World and Practices of The Countries The United States of America**

In the USA, one of the most immense economic powers and most populated countries in the world, the first case of coronavirus was detected on January 20, 2020, in a 35-year-old woman who returned from Wuhan. However, it was possible that the disease had already entered the US borders but could not be detected before this person. According to the NY Times, a total of 380,000 people from China and 4,000 from Wuhan had entered the USA in January (Eder, 2020). Today, it is known that there are active coronavirus cases in all 50 US states (including Virgin Islands, Puerto Rico, Northern Mariana Islands, Guam) except American Samoa (CDC, 2020). As of April 24, 2020, more than 5 million tests were performed in the USA, and 925,758 cases were identified. 110,432 of them have recovered, and the total number of deaths is 52,217.

After the first case detected in the USA, the White House Coronavirus Task Force was created on January 29, 2020, as one of the first measures taken in the USA. Two days later, the Trump administration declared an emergency and banned passengers from China from entering the country (Aubrey, 2020, Morris, 2020). In the USA, the initial response to pandemic was slow, the situation was not taken very seriously, and it was explained that the situation was under control. However, as of March, the US administration and Food and Drug Administration (FDA) allowed companies to produce independent test kits, allowing for more intensive testing. While only 10,000 people were tested in the US at the beginning of March, now the figure is more than 5 million (BBC, 2020; Morris, 2020).

On March 19, 2020, all the US citizens were banned from traveling (Travel state, 2020), bars, restaurants, shops were closed, sports activities were postponed indefinitely, schools and educational institutions were closed (Deb, 2020). People who had been to 28 different European countries in the past 14 days from 20 March had been banned from entering the country, and only the US citizens living abroad were allowed to enter the country. Due to the fact that the incident was not taken too seriously after the initial detection of the virus and the increase in the speed of its spread, a severe shortage of personal hygiene equipment and medical equipment appeared (Akpan, 2020). As the warnings about the social distancing were not taken into consideration, the

increase rate had rocketed. According to the news of the NY Times, it was calculated that the number of deaths would have been 90% less if social distancing had been applied two weeks earlier (Jewell, 2020). The economic burden caused by the pandemic has also been calculated to be enormous. With the losses in the stock market and the decrease in the workload, the epidemic was estimated to cost about 250 billion dollars to the USA (Abelson, 2020). As of the end of August, it is estimated that approximately 60,000 people in the USA will die due to coronavirus and associated complications (COVID 19, 2020). Although it is stated that the measures can be relaxed and daily life can return to normal, this period can be extended since the pace of the epidemic is still not under control.

### **Italy**

As of April 24, 2020, the number of cases is 189,973, and the number of deaths is 25,549 (WHO, 2020a). Apparently, more people have died in Italy than in China. The average age of those who died in Italy is 81 years. About 70% of these patients were smokers and had other comorbidities such as diabetes, cancer, cardiovascular diseases and ARDS. Among the patients who died, more than 80% were older than 60 years of age, showing that this disease affected elderly people mostly.

On March 8, 2020, the Italian Government restricted the movement of people to minimize the contact possibility of non-infected and infected people. However, these decisions were not enough to prevent the spread of the virus. It has been reported that the Italian national health system does not have the capacity of responding effectively to the people who need to be admitted to the intensive care unit due to the SARS-CoV-2 pandemic (Remuzzi and Remuzzi, 2020).

In Italy, the number of beds in intensive care units is approximately 5200. As of March 11, about 20% of them were allocated to patients with SARS-CoV-2 infections, and this number was planned to increase gradually in the near future. Given that the mortality of patients with critical disease with SARS-CoV-2 pneumonia was high and the survival time was 1-2 weeks, the number of infected people in Italy was likely to be a considerable burden. It was determined that there were not enough resources in the hospitals to deal with that emergency, and there was a shortage of health specialists. However, as of February



20, approximately 20% of the health personnel working day and night became infected, and some died (Remuzzi and Remuzzi, 2020).

It has been reported that 10,779 of 97,689 people affected by the Covid-19 pandemic have lost their lives in Italy. On the other hand, 13,030 people recovered and managed to survive the disease (Worldometers, 2020).

While the epidemic was spreading rapidly in the country, Italy's call for masks and medical kit help through the EU Emergency Fighting Coordination Center was left unrequited by other EU countries. Italian Prime Minister Giuseppe Conte stated that the EU should allocate a 500 billion-euro aid package for the member states. Especially the closure of Germany and France to the member countries, stopping the export of masks and medical supplies attracted all criticisms. On March 12, 2020, medical teams from China responded to the urgent needs of Italy with 31 tons of health supplies, respirators, face masks and medicines. It was stated that Germany lifted the ban on exports in the first stage and sent 1 million masks and health supplies to Italy. In addition, on March 22, 2020, Russia sent 100 infection specialists to Italy as well as health supplies. On April 1, Turkey sent medical aid to Italy (NATO, 2020).

Italian Institute of Health (Istituto Superiore di Sanita) revealed that 99.2% of those who lost their lives in the country had other diseases. Accordingly, the most common disease was hypertension with 76.1%, diabetes was ranked second with 35.5%.

## **Spain**

Spain, which is the member country with the highest number of cases in all of Europe, feels the pressure of the health system and economy as the spread could not be controlled. According to data from April 24, 2020, 22,524 patients died in the country where 219,764 people were infected. An uneasy political climate prevails among the ministers in Spain, where 92,355 people survived the infection, and representatives from the Parliament were infected.

Spain, which requested masks and various health materials from the EU on March 16, 2020, stated that 450 thousand respirators, 500 thousand test kits, and 1.5 million surgical masks were needed. On March 24, 500,000 masks and many health supplies were sent from China to the country, which also requested assistance from NATO, on March 17. As part of NATO, 10,000 protective

medical clothing and 90 respirators donated by the Czech Republic on March 29 arrived in Spain. In addition, Turkey helped Spain with 450,000 masks, disinfectants and personal protection equipment (Dominguez-Gil et al., 2020, NATO, 2020).

### **The United Kingdom (UK)**

The UK National Health Service (NHS) encouraged public and health personnel to use personal protective equipment and aimed to get a comprehensive travel history as isolating suspicious cases would reduce the infection promptly.

As of March 24, 19,522 people were infected with coronavirus in the UK, while 135 people were recovered, and 1,228 people were dead. Although the target was set to perform 100,000 tests per day, currently 15,000 to 16,000 people were tested (Armstrong, 2020). As of April 21, 2020, a total of 397,670 people was tested in the UK, and 18,738 people were reported dead (WHO, 2020a). However, as only hospitalized patients were routinely tested, people showing symptoms were not detected whether they were infected with coronavirus unless they were hospitalized, and that was valid even for health care personnel. The UK government, which previously followed the strategy of spreading the virus in a controlled manner to gain social immunity, had to change its policy after criticism and evaluations that the total number of dead could reach 277,000 people.

Besides, private hospitals across the UK have joined the NHS, with 8,000 extra hospital beds, about 1,200 respirators and 20,000 fully qualified health-care professionals. After the agreement, almost all of the hospital capacity in the private sector was allocated to the NHS. According to the news published by the BBC, the NHS were regulated in the capital London to provide access to more than two thousand extra hospital beds and more than 250 operating rooms and intensive care beds (Carroll et al., 2020).

### **Germany**

According to research conducted by the Robert Koch Institute, it was announced that 154,159 people were infected in Germany, and the first case of Covid-19 was detected in February. 106,800 people recovered, while 5,653 people succumbed to the virus. In Europe, Germany ranks 4th after Spain, Ita-

ly and France in Europe according to the number of cases detected (Worldometers, 2020). On March 17, the Robert Koch Institute changed the virus threat from “medium level” to “high level”. In connection with this, while 12,000 tests were carried out at the beginning of March, that figure was increased to 25,000 a day starting from the middle of the month, and that number increased every day. According to Robert Koch Institute’s data, 56% of virus-positive people were male, and 44% were female, and the median age was 47. 54% of the most common symptoms in patients were severe cough and 40% were high fever (Gerke et al., 2020; RKI, 2020).

### **The Major Success of Turkey against the Pandemic and Prerequisites and Policy Making Models that Determine the Efficacy of Health Policies**

The efficacy of a country’s health policies depends on some prerequisites. These prerequisites are as follows (Mckee et al., 2000).

- Visibility: The nature, importance and magnitude of the health problem to be addressed should be visible. These data are critical for policymakers to handle the problem effectively.

- Capacity: The country’s capacity, resources, human resources, material and infrastructure should be sufficient to cope with the problem.

- Embracing: As the public embraces the problems, execution of the decisions will be quicker, and results can be obtained more rapidly. Therefore, it is significant to inform the people correctly, transparently and in all aspects.

- Cross-sectoral collaboration: Solving a health problem requires cross-sectoral collaboration. Failure to realize this object may result in the failure of the policies.

- Effective state: The state has the most crucial role in determining and implementing health policies. A disoriented process will result in unfavorable outcomes.

The process of establishing a health policy requires determination, implementation and monitoring of the policies. The stages in Easton’s policymaking process are defined as follows: The inputs of the policymaking process are “Demand”, “Support” and “Resources” (Barker, 1996). The state transforms these inputs into outputs, that is, goods and services, after going through a process called black boxes. If the State has enough resources (human resources, con-

sumables, device, medicine, building, equipment, infrastructure), the stronger the demand and support from the society for the policies formed by the model, the more efficient the policies will be.

Starting from this health policymaking model, the great challenge of the Republic of Turkey and the causes of the successful results obtained in a relatively short time during the pandemics will be evaluated based on the framework mentioned above.

**Step 1, Visibility:** The visibility, nature and importance of the problem has been revealed with precision in the early period of the pandemics. While the outbreak was not evaluated as COVID-19 pandemic yet, a Scientific Advisory Board was established on January 10, 2020, by the Ministry of Health. Initially, 26 academics from different branches such as infectious diseases, microbiology, virology, internal diseases, intensive care and chest diseases were recruited. Board decisions were advisory decisions, and the implementation belonged to the Ministry of Health. After the board was established, it was convened every day in Ankara campus of the Ministry of Health, and the decisions and recommendations were shared with the public. Awareness and consciousness in the society were raised early in the society through social media, television and newspapers. While the epidemic was limited to China, following the recommendations of the Scientific Board, Ministry of Health started transporting Turkish citizens in China to Turkey. Flights from China and the Far East were banned, the borders of certain countries were closed, trips abroad were cancelled, and the citizens coming from abroad were kept in quarantine for 14 days. In addition, the schools, restaurants, gyms, cinemas, cafes and dormitories were closed, which were all precise measures taken in the early period thanks to the correct determination of the visibility of the problem. After January 9, 2020, the first death in Wuhan, Turkish Scientific Advisory Board published the 2019-nCoV Disease Guide on January 14, 2020. As a result of new developments and information, the guide was updated on January 28, 2020.

At the stage of defining the visibility of the problem, the very first step in determining the effective health policy, the Republic of Turkey pushed the right buttons at the right time and delayed the start of pandemic in Turkey until March 11, 2020.

**Step 2, Capacity:** No matter how well a health policy is planned in theory, if one does not have adequate health resources, human resources and infrastructure that can solve the problem, the policies will be quite far behind being effective and achieving the desired outcomes. Therefore, the most essential factors for achieving good results in a short time compared to the European countries and the United States are the strong health system and infrastructure of the Republic of Turkey. According to 2018 data, there were 38,098 intensive care beds, 1,016,401 healthcare personnel, 231,193 qualified bed capacity, adequate hospital equipment, sufficient number of MR and CT devices, increasing number of city hospitals, domestic production ventilators, protective equipment, and so forth. This data showed that previous plans and strategies did not remain as plans, but were successfully implemented.

**Step 3, Embracing:** One of the most essential prerequisites for health policies to be effective is that the health policies should be adopted by a large part of society. The Ministry of Health of Turkey has dealt with the issue transparently since the very beginning, and especially Minister of Health earned the trust of a huge part of the society. Therefore, all recommendations given by the Ministry of Health were adopted and implemented effectively. In addition, thanks to the correct communication strategies, the process was embraced not only by the society, but also the healthcare professionals who continued the process with great effort and devotion which increased the efficacy and the yield. Since the beginning of the pandemic, almost all public and private hospitals including health institutions have contributed to the fight against COVID-19. Up to 40,000 daily tests were performed using either PCR tests or rapid tests, and the detected positive cases were isolated and put in quarantine to prevent the spread of the virus. Masks and disinfectants were delivered to the houses or through pharmacies without any charge. Advertisement and billboard were used to warn the public against the virus.

**Step 4, Cross-sectoral collaboration:** After the decisions and restrictions, support packages concerning many sectors were announced by President Recep Tayyip Erdogan. Thus, in order to protect public health, significant support will be provided for the fight against the pandemic. These measures are:

### **1. National economic measures**

Economic measures taken by the Presidency of the Republic of Turkey were announced on March 18, 2020, after the Coronavirus Evaluation Meeting and an economic measure package under the name of “Economic Stability Shield” was unveiled covering 100 billion Turkish Liras (approx. USD 15 billion). The measures are as follows:

The tax statements and declarations, VAT discounts, Supplemental Security Income (SSI) premiums between April and June were postponed six months, including food and beverage, cinema-theatre, events-organizations, accommodation, textile-garment, iron-steel and metal industry, automotive, logistics-transportation sectors.

Accommodation tax will not be applied until November 2020.

The easement rights and revenue share payments related to hotel rentals were postponed for 6 months for April, May and June 2020.

In domestic airline transportation, the VAT rate has been lowered to 1% from 18% for 3 months.

The companies whose cash flows are disrupted due to pandemic will be deferred for banks for a minimum of 3 months, and additional financial support will be provided.

Inventory financing support will be provided to the exporters to maintain capacity utilization rates during the temporary deceleration in exports.

For those who declare that their work is negatively affected by the coronavirus, credit debts will be postponed for 3 months with no interest.

The Credit Guarantee Fund limit will be raised from TRY 25 billion (approx. USD 3.5 billion) to TRY 50 billion (approx. USD 7 billion). It will be given to small and medium-sized enterprises (SMEs) and companies with liquidity needs and collateral deficit, as the priority of loans is negatively affected by the developments.

In houses under 500 thousand liras, the loanable amount was increased from 80% to 90%, and the minimum down payment was reduced to 10%.

The companies in default had the opportunity to drop a “force majeure” grade in the credit registry in April, May and June 2020.

Studies are carried out for more flexible and effective remote working models.

The period of the declarations, which include the payments of the deductions at source such as withholding, has been delayed for 3 months.

Short-term employment allowance processes will be facilitated and accelerated. This is an application that provides income support for employees who cannot work for a maximum of three months due to general economic, sectoral, regional crisis or compelling reasons. With this practice, temporary income support will be provided to the workers in the workplaces that interrupt their activities, while employers will reduce their costs.

The lowest pension has been raised to 1,500 Turkish Liras.

The holiday bonus of retirees will be paid in early April 2020.

According to the criteria set by the Ministry of Family, Labor and Social Policies, an additional TRY 2 billion will be allocated in cash to families in need.

Alternative channels will be developed in line with the priorities determined in both production and retail lines against the possibility of disruption in global supply chains.

Periodic follow-up program consisting of social and home care services has been established for the elderly people aged 80 years and over who live alone.

The open rediscount loan principal and interest payments with a maturity of April, May and June 2020 were delayed to October, November and December 2020, and the maximum maturity was extended by 1 year.

The commitment closing period of rediscount credits, which expired in April, May and June 2020, was also extended by 1 year.

Within the scope “do not leave your home”, the shopping malls were closed. However, it was stated that the necessary facilities would be provided to the shopping mall tenants regarding the “Economic Stability Shield” package announced.

## **2. Legal measures**

### ***Suspension of execution and bankruptcy proceedings:***

The decision on the Suspension of Execution and Bankruptcy Proceedings (2279) was published in the Official Gazette dated March 22, 2020, and numbered 31076 within the scope of the measures taken to prevent the spread of COVID-19 epidemic disease in our country. The decision entered into force on the date of its publication.

Within the scope of the said decision; in order to facilitate the applicability of the measures taken to prevent the spread of the coronavirus pandemic, all execution and bankruptcy proceedings were suspended throughout the country, except for execution proceedings, from March 22, 2020, until April 30, 2020. In that context, no execution proceedings were conducted. It was decided not to proceed and not to enforce and precautionary distraint decisions.

### ***Short term working grant***

In the statement made by the Minister of Family, Labor and Social Services on March 22, 2020, it was announced that applications for Short Work Allowance could be made electronically as of March 23, 2020.

### ***Tax office transactions:***

As of March 19, 2020, the measures taken to prevent the spread of coronavirus disease were published by the Revenue Administration. In that context;

1- All petitions that needed to be submitted to the tax office until April 10, 2020, had been submitted electronically via the Interactive Tax Office application or sent by post.

2- Declarations would be made only on the Ready Declaration System until April 10, 2020.

3- Payments related to taxes, fees and administrative fines and valuable paper prices could be paid by credit card through the Interactive Tax Office or contracted banks.

4- Tax payments of corporate taxpayers would be made by using alternative payment channels (the Interactive Tax Office, contracted banks and PTT) instead of tax offices.

5- Those who were not citizens of Republic of Turkey would demand their tax identification number on the Interactive Tax Office website.

In addition to those measures, some others were taken such as suspending notification procedures, making deed transactions online (applications could be made from the internet without going to the Land Registry Office), postponing hearings and discoveries (except emergencies), conducting mediation meetings by teleconference.



### **3. Pandemic prevention measures**

#### ***Working hours of banks:***

On March 22, 2020, the Banks Association of Turkey (BAT) recommended the working hours of banks to be between 12:00-17:00. However, it was stated that the branches and service units of banks could flexibly determine their working and customer acceptance hours. The banks were also responsible for taking necessary measures for preventing close contact with customers and branches at high-risk and crowded areas could be kept out-of-service, and they could provide alternative service channels such as digital banking.

#### ***Flight bans:***

On March 21, 2020, Ministry of Transport and Infrastructure announced that the flights to 49 countries were stopped in addition to the previously stopped flights to 22 countries. Flights to a total of 71 countries included but not limited to Germany, Austria, Belgium, the UK, the USA, Russia, Finland, France, Italy and others had been temporarily stopped until further notice.

#### ***Restrictions on restaurants, bars and cafes:***

On March 21, 2020, Ministry of Internal Affairs announced that all restaurants, cafes, bars, patisseries and similar establishments could serve only delivery service and dine-in was banned. Therefore, all sitting areas were closed.

#### ***Restriction of the activities of the barbers, hairdressers, beauty centers:***

With the Circular issued by the Ministry of Interior, it was decided to temporarily cease the activities of barbers, hairdressers and beauty centers as of March 21, 2020.

#### ***Restriction of entertainment, art, culture and social activities:***

As of March 17, 2020, all cinemas, theaters, concert halls, show centers, engagement/wedding halls, coffee shops, gardens, cafés, casinos, pubs, taverns, hookah lounges, internet cafes, all kinds of indoor children's playgrounds (including shopping malls and restaurants), all kinds of game rooms, tea gardens, amusement parks, swimming pools, Turkish baths, saunas, spas, massage parlors, gyms, and sports centers activities were temporarily suspended.

***Education and training:***

As of March 16, 2020, all primary, secondary and high schools and universities were closed. In that context, as of March 23, 2020, necessary infrastructure preparations were completed in order to continue education on internet and television channels via distance education method.

In addition, the dates of academic exams for higher education were postponed to an unspecified later date.

***Limitations to public institutions:***

Pregnant women working in public institutions and organizations, those who are 60 years of age or older, except those who use breastfeeding leave, disabled people, and those in executive positions were considered administrative leave for 12 days beginning from March 16, 2020. Women officers who have children at preschool term and primary education were granted annual leave. In addition, the departure of public officials abroad was made subject to special permission.

***R&D and design activities:***

On March 15, 2020, the Ministry of Industry and Technology announced that the technopark companies and R&D and Design Centers could continue to benefit from the exemption and incentives until the end of April 2020 by informing the Ministry of Industry and Technology monthly.

**Step 5, Effective State:** In order for all these steps to be succeeded, the determination and priorities of the state are one of the most important factors determining the effectiveness. From the very first moment of the onset of the pandemic, the Republic of Turkey has attached great importance to the problems and has managed to take this grueling process under control by maintaining public order, supporting the economy, keeping the wheels turning and taking one step at a time against the pandemic. In the coming days, it will be of great importance to be on the safe side for a possible second wave of the outbreak with gradual normalization.

## CONCLUSIONS AND LIFE AFTER CORONAVIRUS

Due to the difficulties caused by coronavirus, hard times have been experienced in the economy. According to FlightRadar24, a site where flights can be tracked worldwide, the number of passengers decreased to 70,000 on April 24, 2020, from 200,000 on February 21, 2020 (Flight Radar, 2020). Economies have come to a halt in the world due to curfews and isolations. Due to the demand for the hospitals, the health system suffered from a lack of personnel and equipment. Due to the interruption of education in schools and universities, the necessary infrastructure was established for distance education. Economies have shrunk significantly due to restrictions in banking and trade. After the coronavirus pandemic decreases or ends, intensive studies will be carried out to eliminate all these failures. People will start taking new health measures, and there will be new preferences in transportation. This is expected to increase costs. According to the plans made for gradual normalization, countries have announced their plans. Germany and Austria are planning to open schools on May 4, 2020. Even though the small shops up to 800 square meters are opened, social distancing will be the primary concern and festival areas, concerts, open-air activities are banned till the end of August.

In the Czech Republic, citizens are allowed to run without a mask and ride a bicycle. Those with reasonable reason were allowed to travel overseas but were required to stay in quarantine for 2 weeks upon return. The Czech government plans to bring the country back to everyday life with a 5-digit plan. As of May 25, bars, cafes and restaurants have been opened, but it is forbidden to sit indoors, only sitting in open spaces is allowed. As of June 8, it has been planned to open big stores, shopping centers, hotels, zoos. Book shops, laundries, stationeries have been opened in Italy, which are the countries most affected sectors by the epidemic. Restrictions in Italy are expected to be completed on May 4.

Some factories and construction workers started working in Spain, but most of the stores were closed. Although the restrictions were planned to be ended on April 27, this date would likely to be delayed. In Denmark, as the number of cases encountered was high (about 7,000 cases), schools were opened on the week of April 18, but restaurants and stores remained closed until May 10 (Doherty, 2020).

In Turkey, it was planned to ease the restrictions as of the beginning of June, and make compensation education in schools during the summer period. It was planned to gradually return to the everyday life in places such as restaurants, bars, mosques, places of worship, sports fields, cinemas, and sports halls from the beginning of June. The success of the Republic of Turkey against the pandemic may be attributed to the well-developed health system, actions taken in a short time, informing the public effectively and transparently. It is believed that Turkey will and can struggle intensely against the present pandemic and a possible second wave.

**REFERENCES**

- Abelson, R. (2020, April 29). Coronavirus may add billions to the nation's health care bill. <https://www.nytimes.com/2020/03/28/health/coronavirus-insurance-premium-increases.html>
- Akpan, N. (2020, May 12). U.S. has only a fraction of the medical supplies it needs to combat coronavirus. <https://www.nationalgeographic.com/science/2020/03/us-america-has-fraction-medical-supplies-it-needs-to-combat-coronavirus/>
- Armstrong, M. (2020, April 24). Covid-19: people tested in the UK <https://www.statista.com/chart/21316/people-tested-covid-19-uk/>
- Aubrey, A. (2020, April 26). Trump declares coronavirus a public health emergency and restricts travel from China. <https://www.npr.org/sections/health-shots/2020/01/31/801686524/trump-declares-coronavirus-a-public-health-emergency-and-restricts-travel-from-c>
- Barker, C. (1996). *The healthcare policy process*, London, Sage Publications.
- BBC. (2020, April 24). Coronavirus: Should Americans be worried? <https://www.bbc.com/news/world-us-canada-51649897>
- Carroll, W. D., Strenger, V., Eber, E., Porcaro, F., Cutrera, R., Fitzgerald, D. A., Balfour-Lynn, I. M. (2020). European and United Kingdom COVID-19 pandemic experience: The same but different. *Paediatric Respiratory Reviews*, 35,50–56.
- CDC. (2020, April 24). Cases in the U.S. <https://www.cdc.gov/coronavirus/2019-ncov/cases-updates/cases-in-us.html>
- Cheng, Z., Shan, J. (2020). Novel coronavirus: where we are and what we know. *Infection*, 48,155–163.
- COVID 19. (2020, May 1). Covid 19 projections. <https://covid19.healthdata.org/united-states-of-america>
- Deb, S. (2020, April 25). Sports leagues bar fans and cancel games amid coronavirus outbreak. <https://www.nytimes.com/2020/03/11/sports/basketball/warriors-coronavirus-fans.html>
- Del Rio, C., Preeti, N.M. (2020). COVID-19 - New insights on a rapidly changing epidemic. *JAMA*, 323,1339-1340.
- Doherty, B. (2020, April 30). The exit strategy: how countries around the world are preparing for life after Covid-19 <https://www.theguardian.com/world/2020/apr/19/the-exit-strategy-how-countries-around-the-world-are-preparing-for-life-after-covid-19>
- Domínguez-Gil, B., Coll, E., Fernández-Ruiz, M., Corral, E., Del Río, F., Zaragoza, R., Rubio, J. J., Hernández, D. (2020). COVID-19 in Spain: Transplantation in the midst of the pandemic. *American journal of transplantation*, 20,2593–2598.
- Eder, S., Fountain, H., Keller, M.H., Xiao, M., Stevenson, A. (2020, April 24). 430,000 people have traveled from China to U.S. since coronavirus surfaced. <https://www.nytimes.com/2020/04/04/us/coronavirus-china-travel-restrictions.html>
- European Response. (2020, May 5). The common EU response to COVID-19 <https://europa.eu/european-union/coronavirus-response>
- Fei, Z., Ting, Y., Ronghui, D, Guohui, F., Ying, L., Zhibo, L. (2020). Clinical course and risk factors for mortality of adult inpatients with COVID-19 in Wuhan, China: a retrospective cohort study. *Lancet*, 28,39.
- Flight Radar. (2020, April 24). <https://www.flightradar24.com/data/statistics>
- Gerke, S., Stern, A. D., Minssen, T. (2020). Germany's digital health reforms in the COVID-19 era: lessons and opportunities for other countries. *NPJ Digital Medicine*, 3, 94.

Jee Y. WHO International Health Regulations Emergency Committee for the COVID-19 outbreak. *Epidemiology Health*, 42.

Jewell, B. (2020, May 1). Opinion | The huge cost of waiting to contain the pandemic. <https://www.nytimes.com/2020/04/14/opinion/covid-social-distancing.html>

Lucey D. (2020, May 2). Wuhan seafood market may not be source of novel virus spreading globally <https://www.sciencemag.org/news/2020/01/wuhan-seafood-market-may-not-be-source-novel-virus-spreading-globally>

Mckee, M., Zwi, A., Koupilova, I., Sethi, D., Leon, D. (2000). Health policy-making in central and eastern Europe: Lessons from the inaction on injuries. *Health Policy and Planning*, 15,263-269.

NATO. (2020, April 27). Coronavirus response: Turkish medical aid arrives in Spain and Italy. [https://www.nato.int/cps/en/natohq/news\\_174826.htm](https://www.nato.int/cps/en/natohq/news_174826.htm)

Novacyt. (2020, April 2). In Brief This Week: Novacyt, Co-Diagnostics, Abbott, and More. [https://www.360dx.com/brief-week-novacyt-co-diagnostics-abbott-and-more#.XsPol9tS\\_Mw](https://www.360dx.com/brief-week-novacyt-co-diagnostics-abbott-and-more#.XsPol9tS_Mw)

Pascarella, G., Strumia, A., Piliago, C., Bruno, F., Del Buono, R., Costa, F., Scarlata, S., Agrò, F. E. (2020). COVID-19 diagnosis and management: a comprehensive review. *Journal of Internal Medicine*, 288,192-206.

Remuzzi, A., Remuzzi, G. (2020). COVID-19 and Italy: what next? *Lancet*, 395,1225-28.

RKI. (2020, April 26). Coronavirus disease 2019 (COVID-19) daily situation report of the Robert Koch Institute. [https://www.rki.de/DE/Content/InfAZ/N/Neuartiges\\_Coronavirus/Situationsberichte/2020-03-18-en.pdf?\\_\\_blob=publicationFile](https://www.rki.de/DE/Content/InfAZ/N/Neuartiges_Coronavirus/Situationsberichte/2020-03-18-en.pdf?__blob=publicationFile)

Russell, T. W., Hellewell, J., Jarvis, C. I., van Zandvoort, K., Abbott, S., Ratnayake, R., Cmmid Covid-Working Group, Flasche, S., Eggo, R. M., Edmunds, W. J., Kucharski, A. J. (2020). Estimating the infection and case fatality ratio for coronavirus disease (COVID-19) using age-adjusted data from the outbreak on the Diamond Princess cruise ship, February 2020. *Euro surveillance : bulletin European sur les maladies transmissibles = European Communicable Disease Bulletin*, 25.

Sharpe, H. R., Gilbride, C., Allen, E., Belij-Rammerstorfer, S., Bissett, C., Ewer, K., Lambe, T. (2020). The early landscape of coronavirus disease 2019 vaccine development in the UK and rest of the world. *Immunology*, 160,223-232.

Travel state. (2020, April 24). Global level 4 health advisory—Do not travel. <https://travel.state.gov/content/travel/en/traveladvisories/ea/travel-advisory-alert-global-level-4-health-advisory-issue.html>

Walsh, F. (2020, April 25). The first human trial in Europe of a coronavirus vaccine has begun in Oxford. <https://www.bbc.com/news/health-52394485>

WHO (2020a, April 24). Coronavirus disease 2019 (COVID-19) Situation Report-95. [https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200424-sitrep-95-covid-19.pdf?sfvrsn=e8065831\\_4](https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200424-sitrep-95-covid-19.pdf?sfvrsn=e8065831_4)

WHO (2020b, April 24). Statement on the second meeting of the International Health Regulations (2005) Emergency Committee regarding the outbreak of novel coronavirus (2019-nCoV). [https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-\(2005\)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-\(2019-ncov\)](https://www.who.int/news-room/detail/30-01-2020-statement-on-the-second-meeting-of-the-international-health-regulations-(2005)-emergency-committee-regarding-the-outbreak-of-novel-coronavirus-(2019-ncov))

Worldometers. (2020, April 24). <https://www.worldometers.info/coronavirus/#countries>











# A Project to Improve Service Delivery of Medical Clinic in a State Hospital in Sri Lanka by Application of Lean Principle

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## ABSTRACT

Lean is a set of operating philosophies and methods that could create maximum value for patients by reducing waste and waits when applied for health care. The study aimed to improve the service delivery of medical clinic in Base Hospital Dambadeniya (BHD) in Sri Lanka through the application of lean principles to the clinic process. Focus Group Discussions (FGDs) with patients and staff, Key Informant Interviews (KIIs) with the medical superintendent and Consultant Physician, survey of patient satisfaction with the use of self-administered questionnaire, and process mapping were carried out to gather data at pre and post-intervention stages. Long waits, congestion at the clinic, undue queuing at pharmacy, and unnecessary movements had led to poor patient satisfaction and raised concerns in the staff regarding unsatisfactory work environment.

Application of lean management based on the elimination of waste, combining, rearranging and simplifying of elements of the process, reduced waits by 52%. The total requirement of staff reduced by 26% and patient satisfaction improved in selected attributes by 40%.

**Keywords:** Lean Principles, Medical Clinic, Process Mapping, Service Delivery, Waiting Time

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## INTRODUCTION

Lean is a set of operating philosophies and methods that could create maximum value for patients by reducing waste and waits. Changing organizational thinking and values to lead the transformation of organizational behaviour and culture over time is the fundamental aim of lean principles (Lawal et al. 2014). The concept which originated in Japan at the Toyota car manufacturing facility paved the way to understand the purpose of any production or service by deeply analysing the workflow to identify and eliminate non-value adding activities (Holweg 2007).

A lean implementation involves value stream mapping (VSM) that defines the journey of improvement followed by flexible work systems and 5S (sorting, straightening, systematic cleaning, standardizing, and sustaining). Standard work, total productivity maintenance (TPM), and mistake-proofing (Jidoka), supply and demand through just in time (JIT) pull systems and level scheduling (Heijunka) are other important components of lean principle (Teich and Faddoul 2013).

Successful application of lean philosophy has reportedly improved quality, safety, efficiency, and appropriateness of health care delivery in other countries (Houchens and Kim 2014) (Fine et al. 2009). Lean principles are used to increase efficiency in patient flow (Radnor and Walley 2008), reduce patient's waiting time (Mazzocato et al. 2012) and improve satisfaction of staff and patients (Radnor et al. 2012).

Further, lean thinking has been applied in health care to eliminate delay, repeated encounters, errors and inappropriate procedures (Young 2004).

The medical clinic is one of the major points of service delivery in a hospital, where a team of health workers including doctors, nurses and health assistants is led by a consultant physician and assisted by a nursing sister. The clinic is supported by the laboratory, pharmacy, and radiology department. Majority of clinic attendees are patients with chronic non-communicable diseases. New patients are directed to the clinic by wards, Out-Patients Department (OPD) and medical practitioners within and outside the hospital.

Due to increasing patient loads and higher patient expectations, clinic operations at secondary level hospitals could be complicated and inefficient. This can result in congestion creating long queues. Increased waiting time has

reportedly made the patients spend the whole day in the clinic (Mathugama 2011). Moreover, the chaotic working environment could increase the staff stress and incidence of medical errors in clinics where patients' safety gets compromised (Houchens and Kim 2014).

The current study aimed to assess how the service delivery process of the medical clinic could be improved through the application of lean principals to achieve better external and internal customer satisfaction.

## **METHODOLOGY**

The study was conducted in the medical clinic of BHD, a secondary care hospital with 258 beds situated in Kurunegala district of Sri Lanka.

The study was carried out from January 2019 to June 2019 in three phases namely, assessment of the current process of medical clinic, applying lean management principles to manage the identified issues and evaluation the effectiveness of the intervention.

The process of the medical clinic was mapped both pre and post-intervention stages and average waiting time at each component of the process was estimated.

FGDs with patients and staff, KIIs with Medical Superintendent and consultant physician and Patient satisfaction survey were performed. FGDs were carried out with multiple groups consisted of 8 participants in each. Separate FGDs were conducted with patients and staff of the medical clinic. Altogether one FGD with the staff and three with patients were conducted. FGDs were recorded in audio format and the main concerns raised by the participants were documented. Interviews were conducted according to a KII guide which was prepared by the investigators and pretested. Patient satisfaction survey was conducted with the use of a self-administered questionnaire in which perceived level of satisfaction regarding the selected attributes of the process of medical clinic was captured by a Likert scale. The questionnaire was designed by the investigators themselves and it was pretested and validated. Purposive sampling was adopted to recruit the patients for the survey and 332 patients were selected. Patients followed up for more than one year in the clinic were included while those who were illiterate and could not respond to the questionnaire independently were excluded. Non-responders were not considered for calculations.

A lean Improvement Team (LIT) was established with one medical officer, one nursing sister, two nurses, three paramedical officers, one clerical officer and one health assistant who volunteered for the purpose. Process mapping was carried out by the LIT and gaps identified were prioritized.

The lean intervention was planned to handle the gaps based on Plan Do Check Act (PDCA) cycle which underpins many lean principles and offers a paradigm for continuous improvement of design and operations (International Group for Lean Construction 2014). According to lean principles, process redesign was done through eliminating, combining, re-arranging and simplifying the clinic process. The process was assessed to detect the presence of any of the seven wastes introduced in lean thinking, namely; defects, unnecessary motion, overproduction, transport of products or material, unnecessary waiting, unnecessary inventory and inappropriate processing (Green et al. 2015). Necessary steps were taken to eliminate wastes while being cautious not to disrupt the core activities identified during the process mapping phase.

The intervention was evaluated with the same research tools used at the pre-intervention stage.

Responses of FGDs and KIIs were coded and analysed. Pre and post interventional patients' satisfaction in selected attributes were compared using Z test for proportions. During analysis, P value of  $<0.05$  was considered significant. Pre and post-intervention "waiting times" were compared using Mann-Whitney U test.

Ethical clearance was obtained from the ethical review committee, Post-graduate Institute of Medicine (PGIM) University of Colombo (ERC/PGIM/2019/01). Informed written consent was obtained from participants.

## RESULTS

The medical clinic served patients two days per week. In 2019, the number of registered patients of medical clinic was 30572 (Medical Statistics Unit, Base Hospital, Dambadeniya 2019). Usually, each patient was seen at the clinic once a month since the first visit.

According to the pre-intervention process map, three types of waiting were noticed namely, waiting for the registration (W<sub>1</sub>), waiting for the consultation (W<sub>2</sub>), waiting at the pharmacy (W<sub>3</sub>) and the total average waiting time was 211 minutes (Table 3).

The following concerns were identified during the FGDs with patients of the medical clinic;

- I. Having to come to the clinic very early to secure an appointment
- II. Long waiting time at the clinic and pharmacy
- III. Inconvenience of investigation procedure (Sample collection for investigations was arranged only in Wednesdays and the report had to be collected by patient from the laboratory)
- IV. Lack of proper information desk

The concerns raised during the FGDs with the staff of the medical clinic were;

- I. Excess paperwork
- II. Congested and noisy working environment at the clinic and pharmacy
- III. Frequent and repeated disturbances by patients and relatives for information/inquiries

Concerns raised during KII s were,

- I. Unduly dragged clinic sessions
- II. Poor working environment.

The following intervention were planned and carried out considering the gap analysis.

- I. Establishment of an information desk
- II. Introduction of an appointment system
- III. Allocation of a separate waiting area for clinic patients with adequate seating facilities
- IV. Making the investigation facilities available for clinic patients on all five weekdays
- V. Delivery of lab reports directly to the clinic
- VI. Displaying instructions with direction boards
- VII. Arranging an extra drug dispensing outlet at pharmacy on medical clinic days as a measure of reducing waiting time and congestion

A nursing officer with good communication skills was appointed to the information desk (Intervention I). The patients, relatives and public were offered the opportunity to obtain information and clarify doubts. A date and a time for the next clinic visit were given for each patient after considering his/her preferences and available options (Intervention II) and it was carried out by

the nursing officer at the information desk which also served as the registration point. During the clinic, only those patients allocated for a specific time slot were allowed into the clinic waiting area (Intervention III). This reduced the congestion, rush and noise in the clinic and smoothed the clinic flow. The hospital was able to reduce three security officers out of those who were assigned for crowd handling within the clinic. The patients had a choice in planning the day they came for investigations if there were any (Intervention IV), which was noted down by at the registration itself. This allowed the laboratory to be informed in advance the number of clients from the medical clinic to be expected on a given day so that they could plan the schedule better. Once the number of planned investigations for a given date reached an agreed maximum, the medical clinic was informed to be cautious by letting the patients know that the date has been overbooked and offering them other available time slots. Burden for lab staff was relieved with the reduction in congestion enabling a better work environment. The patient did not have to go to the lab to collect the reports as they were delivered to the clinic in advance (Intervention V). Patients were better informed with the direction boards and displayed patient guides (Intervention VI) and they could go to the information desk (intervention I) for further queries. The main intention was to eliminate unnecessary patient movements while enhancing responsiveness. As a result, the undue disturbances to the clinic staff with repeated haphazard inquiries of patients and relatives were reduced and the overall working environment was improved and more organized. The opening of additional drug dispensing counter contributed to reducing waits at the pharmacy.

The main intention of the interventions was to eliminate wastes while adding value to the process flow and it was found that the utilization of human resource had been improved where the total staff requirement was reduced by 26.31% (Table 1) parallel to the reduction of steps from 9 to 6 in the process.



**Table 1:** Human resource utilization pre and post-intervention.

Resource	Pre-intervention	Post intervention
Security personal	05	02
Minor staff	09	07
Pharmacist	02	03
Nurses	03	02
Total	19	14

As the collection of blood samples for investigations were carried out in all five working days of the week and the time slots were issued to the patients in a better planned manner the number of investigations performed for medical clinic patients had increased nearly by 20% (Table 2).

**Table 2:** Number of investigations done by the laboratory pre and post-intervention for medical clinic

Type of investigations	Month of March	Month of May
Fasting Blood Sugar (FBS)	368	432
Full Blood Count (FBC)	55	68
Post Prandial Blood Sugar (PPBS)	17	21
Lipid profile	103	119
Serum Electrolytes	29	41
Liver enzymes (SGPT/SGOT)	17	28
Total	589	709

Overall waiting time had reduced significantly which showed 52% improvement (Table 3).

**Table 3:** Waiting time in the medical clinic before and after the intervention

	Pre-intervention	Post-intervention	P value
Waiting for the registration (W1)	116 min	50 min	0.001
Waiting for the consultation (W2)	59min	42 min	0.263
Waiting at the pharmacy (W3)	36 min	09 min	0.001
Total waiting time	211 min	101 min	0.001

The perceived level of satisfaction of patients regarding all attributes of medical clinic considered, showed significant improvement and the overall satisfaction was improved by 40% (Table 4).

**Table 4:** Perceived level of patients’ satisfaction regarding selected attributes of medical clinic– pre and post intervention.

	Attribute	Percentage of satisfaction		Z value	P value
		Pre-intervention	Post-intervention		
1	Transparency of issuing numbers	22% (43/194) *	96% (243/293)*	16.1	0.001
2	Time taken to enter the clinic	05% (14/266)*	39% (39/195)*	05.0	0.001
3	Clarity of instructions given by clinic staff	78% (87/111) *	88% (165/188)*	02.3	0.02
4	Simplicity of the clinic flow	85% (162/190)*	95% (210/221)*	03.4	0.001
5	Unnecessary movements within the clinic	70% (162/230)*	82% (160/195)*	02.9	0.040
6	Efficiency of the clinic flow	79% (138/175)*	95% (175/185)*	04.5	0.001
7	Prompt attention	84% (178/212)*	95% (200/211)*	03.7	0.001
8	Time spent for the clinic	62% (120/193)*	73% (147/202)*	02.3	0.001
9	Leniency in fixing next appointment	60% (132/220)*	70% (156/222)*	02.2	0.030
10	Overall satisfaction regarding the clinic	53% (103/194)*	93% (192/207)*	09.1	0.001

\*The numbers in parenthesis indicate the number of patients satisfied, out of total responded to the relevant question

## DISCUSSIONS AND CONCLUSIONS

Medical clinic in secondary care hospitals is a core component in health care service delivery. The satisfaction of internal and external customers reflects the efficiency of any clinic.

Major gaps including congestion and queuing, increased waiting-time and poor record management in medical clinic of BHD, has negatively affected the experience of both service providers and the customers.

The project used process mapping that gave more detailed view of a selected process to assess patient care pathway in healthcare settings (Trebbe et al. 2010) than value stream mapping which is used more commonly in lean method (Henrique et al. 2016).

Healthcare is known to have its specific types of waste regarding information, process, and physical environment (Campbell 2009). The main wastes identified in the current study were mostly belonged to process and information categories namely, unnecessary waiting for appointment, unnecessary movement of the patients to collect investigation reports and over-processing while sorting clinic records.

Appointment scheduling to mitigate the detrimental effects of patient waiting and clinic overtime has proven to be successful in other countries (LaGanga and Lawrence 2012) (Jamjoom et al. 2014). A project has shown a 94% reduction in patients' average waiting time by application of lean Six Sigma methodology in the registration process of a hospital (Bhat et al. 2014). Introduction of the topre-appointment schedule in the current study, prevented the congestion and smoothed the flow at the clinic where the waiting time from door to registration (W1) was reduced by 43.01% (116 minutes to 50 minutes). Yet the wait for the consultation (W2) from registration was not significantly improved. This could be due to the fact that wait for consultation depends on the time taken for the doctor to finish the previous patient's appointment (length of the previous consultation) which is associated with different patient and physician characteristics (Kabeya et al. 2017). There are arguments that since healthcare is predominantly designed to be capacity-led and there is limited space to make full use of freed-up resources (Radnor et al. 2012). But here the process simplification helped to reduce the human resource utilized in the clinic and the hospital administration had the opportunity to deploy them in

other needy sections. Similarly, 48% reduction scheduled utilization of staff through lean management has been reported in a study conducted in a Medical College hospital in India (Bhat et al. 2014). In the current study, the only occasion where there was an addition to the human resource requirement was where deploying an additional pharmacist to the extra drug dispensing counter. Still, that was proven to be an investment when the gain in patient satisfaction and reduced waiting time (W3) were considered.

The increase in the number of investigations carried out by the laboratory for medical clinic could be due to the fact that the patients who used to go to outside private laboratories might have started to get the tests done at the hospital after the procedure became more user friendly with the interventions. The fact is also a proxy indicator of the success of the project.

The application of lean management has reportedly improved the patient flow in international settings (Chan 2014). Process simplification in the current study, based on the elimination of waste, Combining, Rearranging and Simplifying (ECSR) of elements was able to make the clinic flow more organized and less congested.

Prolonged waiting, queuing and congestion were observed in the medical clinic BHD. Process map analysis revealed wastes including long waits, unnecessary movements of the patient and over-processing. It has been discussed globally, the potential to improve health care delivery with lean principles is realistic only upon some methodological and practical considerations (Joosten et al. 2009). Lean healthcare implementations are claimed to have a limited impact on improving patient satisfaction unless care providers pay considerable attention to integrating the patient's perspective (Poksinska et al. 2017). Process redesign was carried out in the current study by applying lean principles through eliminating, combining, rearranging and simplifying the clinic process. As a result, total waiting time reduced significantly and the patients' satisfaction on the clinic process and flow in selected attributes improved.

A key to success in quality improvement efforts in healthcare is the coordination of patient care efforts through better information management. Extending HHIMS to cover the medical clinic would enable the elimination of delays in retrieval of clinic records.

**REFERENCES**

- Campbell, R. J. (2009). Thinking Lean in Healthcare. *Journal of AHIMA* 80, 40–43.
- Chan, H. (2014). Lean techniques for the improvement of patients' flow in emergency department. *World Journal of Emergency Medicine*, 5,24.
- Fine, B., Golden, B., Hannam, R., Morra, D. (2009). *Leading Lean: A Canadian Healthcare Leader's Guide*. *Healthcare Quarterly*, 12,32–41.
- Green, C. F., Crawford, V., Bresnen, G., Rowe, P. H. (2015). A waste walk through clinical pharmacy: How do the 'seven wastes' of Lean techniques apply to the practice of clinical pharmacists: A waste walk through clinical pharmacy. *International Journal of Pharmacy Practice*, 23,21–26.
- Henrique, D. B., Rentes, A. F., Godinho Filho, M., Esposto, K. F. (2016). A new value stream mapping approach for healthcare environments. *Production Planning & Control*, 27,24–48.
- Holweg, M. (2007). The genealogy of lean production. *Journal of Operations Management*, 25, 420–437.
- Houchens, N., Kim, C. S. (2014). The Application of Lean in the Healthcare Sector: Theory and Practical Examples. In N. Wickramasinghe, L. Al-Hakim, C. Gonzalez, & J. Tan (Eds.), *Lean Thinking for Healthcare* (pp. 43–53). Springer New York.
- International Group for Lean Construction (Ed.). (2014). 21st annual conference of the International Group for Lean Construction 2013: (IGLC 21) ; Fortaleza, Brazil, 29 July - 2 August 2013. Curran.
- Jamjoom, A., Abdullah, M., Abulkhair, M., Alghamdi, T., Mogbil, A. (2014). Improving Outpatient Waiting Time Using Simulation Approach. 2014 European Modelling Symposium, 117–125.
- Kabeya, Y., Uchida, J., Toyoda, M., Katsuki, T., Oikawa, Y., Kato, K., Kawai, T., Shimada, A., Atsumi, Y., Higaki, M. (2017). Factors affecting consultation length in a Japanese diabetes practice. *Diabetes Research and Clinical Practice*, 126,54–59.
- LaGanga, L. R., Lawrence, S. R. (2012). Appointment Overbooking in Health Care Clinics to Improve Patient Service and Clinic Performance. *Production and Operations Management*, 21, 874–888.
- Lawal, A. K., Rotter, T., Kinsman, L., Sari, N., Harrison, L., Jeffery, C., Kutz, M., Khan, M. F., Flynn, R. (2014). Lean management in health care: Definition, concepts, methodology and effects reported (systematic review protocol). *Systematic Reviews*, 3,103.
- Mathugama, S. C. (2011). Waiting time studies to improve service efficiency at national hospital of Sri Lanka.
- Mazzocato, P., Holden, R. J., Brommels, M., Aronsson, H., Bäckman, U., Elg, M., Thor, J. (2012). How does lean work in emergency care? A case study of a lean-inspired intervention at the Astrid Lindgren Children's hospital, Stockholm, Sweden. *BMC Health Services Research*, 12,28.
- Medical Statistics Unit, Base Hospital, Dambadeniya (2019). Hospital statistics, Base Hospital Dambadeniya.
- Radnor, Z. J., Holweg, M., Waring, J. (2012). Lean in healthcare: The unfilled promise? *Social Science & Medicine*, 74,364–371.
- Radnor, Z., Walley, P. (2008). Learning to Walk Before We Try to Run: Adapting Lean for the Public Sector. *Public Money & Management*, 28,13–20.
- Teich, S. T., Faddoul, F. F. (2013). Lean Management – the Journey from Toyota to Healthcare. *Rambam Maimonides Medical Journal*, 4, 7.

Treble, T. M., Hansi, N., Hydes, T., Smith, M. A., Baker, M. (2010). Process mapping the patient journey: An introduction. *BMJ*, 341,4078-4078.

Young, T. (2004). Using industrial processes to improve patient care. *BMJ*, 328,162–164.







# Effects of Retail Prices on Cigarette Consumption

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## ABSTRACT

Retail price comprising tax is supposed to be one of the measures to reduce tobacco consumption which is one of the most important mortality and morbidity causes at global level. This study aims to investigate the effects of retail prices and affordability in Turkey on decreased cigarette consumption.

In this study, the necessary time to earn one cigarette was estimated as workload of people with minimum wage. Correlation analysis between the necessary time and the amount of cigarette consumption showed a significant negative correlation of 92.1%. Our results indicate that, the purchasing power of the target community rather than the price of cigarettes with or without taxes is more effective for tobacco control.

**Keywords:** Tobacco Consumption, Cigarette Prices, Purchasing Power

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## INTRODUCTION

Tobacco consumption is one of the most important public health issues for all countries. According to the data of Global Burden of Diseases Study 2017

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conducted by the Institute for Health Metrics and Evaluation (IHME), 14% of the deaths in the world and 21% of the deaths in Turkey are caused by tobacco consumption (IHME, 2020).

Non-communicable diseases are the leading causes of mortality and tobacco consumption is among the first line risk factors for these diseases. Being a preventable cause, there is a worldwide fight against tobacco consumption.

To prevent mortalities caused by tobacco consumption the World Health Organization (WHO) brought the Framework Convention on Tobacco Control to the agenda in 2003, and declared MPOWER measures to draw a global roadmap in 2008. Turkey participated in the Framework Convention on Tobacco Control in April 28, 2004.

The WHO, in 2015, declared that Turkey was the only country that fulfilled the criteria of MPOWER. However, during the same year 41.4% of men and 16.3% of women over 15 years old in Turkey were consuming cigarettes on a daily basis, and these rates were far above the high humanitarian developed country averages (American Cancer Society, 2019).

In order to prevent the negative economic and social effects of tobacco use and to reduce the direct and indirect costs caused by tobacco consumption, several measures for reducing tobacco consumption have been implemented all over the world. Among these, increasing the taxes seems to be the most common practice.

Increasing taxes and therefore increasing prices in tobacco products is supposed to be one of the most effective methods for reducing tobacco use. This method, which is especially effective in reducing the tobacco use of young people, helps to convince smokers to quit.

According to the reports, in only four countries, representing only 2% of the world population, tobacco taxes are more than 75% of the retail price. A 70% increase in cigarette prices is reported to reduce deaths worldwide by 25% (WHO, 2008).

Tax amount in the retail price does not comprise a fixed ratio due to combination of excise and fixed taxes. Thus, more reliable value seems to be the retail price itself. The aim of this study is to analyze the effects of cigarette retail prices influenced by taxes which are applied in our country on cigarette sales.

## METHODOLOGY

Cigarette sales and retail revenue data were compiled from data published by the Ministry of Agriculture and Forestry. The average retail price of one cigarette was found by dividing the total retail revenue by the sales amount. Since there are twenty cigarettes in a pack, this number has been multiplied by twenty to reach the retail price of a pack of cigarettes. The pack price had to be calculated, for fixed taxes were implemented per pack. Total retail revenue amounts are expressed in dollars using the annual average exchange rates compiled by the Ministry of Treasury and Finance.

Data on the minimum wage is compiled from the annual minimum wage data published by the Ministry of Family, Labor and Social Services. The minimum wage had been increased twice a year, in the first six and second six months, until 2016. Then it has been increased once a year to be applied from the beginning of the year. In terms of comparability, the first six months minimum wage amount was used for the periods before 2016.

Through the Inflation Calculator which was developed by the Central Bank of the Republic of Turkey (TCMB) inflation-free real amounts of annual data of cigarette sales and the minimum wage were obtained.

In calculating the necessary working time to earn one cigarette, average retail cigarette sale price, net minimum wage and monthly working time to earn the minimum wage are used. Article 63 of the Labor Law No. 4857 stipulates that the weekly working time is 45 hours, and this period is distributed equally over working days unless otherwise specified or otherwise agreed. According to this, in a workplace which operates six days a week, the daily working time will be 7.5 hours. In Social Security Institution procedure, the month is taken into account as 30 days, so the monthly working time is calculated as  $30 \times 7.5 = 225$  hours. This monthly working time of 225 hours was expressed as 810,000 seconds. As a result of dividing the minimum wage by 810,000 seconds, the time to work for 1 Turkish Lira (TL) was calculated as seconds. Starting with the fact that there are 20 cigarette pieces in a pack, the price of cigarette pack is divided by 20 and the price of one cigarette piece was found. Given the retail price of one cigarette, the number of seconds needed to earn enough for one cigarette was calculated by multiplying the price of one cigarette by the time required to work for 1 TL.

$$T = RP \times (225 \times 3,600) / NMW$$

RP: Retail Price one piece

NMW: Net Minimum Wage

T: Necessary time to afford one cigarette (seconds)

“Cigarette sales amount”, “time for one cigarette piece” and “real sale price” variables were analyzed in terms of distribution with Shapiro-Wilk test. It was determined that these variables showed normal distribution ( $p > 0,05$ ). As the variables were measured numerically and showed normal distribution, a correlation analysis was made with the Pearson Correlation coefficient.

Actually, the effect of sole tax could not be analyzed as its share in the real pack price was not easy to estimate. There is a fixed tax for each pack additional to proportional excise tax. The analyses were so made using cigarette pack total sale prices which included production costs, marketing costs and benefits together with different types of taxes.

## RESULTS

Domestic cigarette sales and retail prices from 2008 to 2018 are seen in Table 1. Table 2 shows the change in the excise tax amount applied to tobacco products within the relevant years. Analyzing the amount of cigarette sales in the domestic market between 2008 and 2018, shows a marked decrease in the first half of the period. However, starting from 2014 it started to increase gradually. We can see continuous increases in nominal cigarette prices by time, but increases in real prices were not so prominent.

Changes of real and nominal retail cigarette sale prices and changes in quantity of sales over the years are shown comparatively in Figure 1. Yearly nominal price increase can easily be seen. However, the real price increase gradient was very low. On the contrary, there was slight decrease in 2015 and more prominent decrease after 2017. As a reflection of this, an increase in the amount of cigarette sales can be observed in the same periods.

Figure 2 shows the real and nominal changes of the net minimum wages throughout the years 2008 and 2019. Although nominal minimum wages increased gradually by years, real minimum wage changes remained flat, except a sharp increase in 2016. The reflection of a 30% increase in minimum wage just

after the parliamentary elections can be seen in the Figure.

The working time of a person with minimum wage to afford one cigarette and the sales amount of cigarettes in the same period time are given in Figure 3. The Figure actually compares the time spent to earn money to buy one cigarette and the amount of its sale shown in Figure 1.

Although real cigarette prices increased between 2015 and 2016, the amount of time required to earn one piece decreased during this time. Consequently, a rapid increase shift started in cigarette consumption.

When a correlation analysis was made between the time spent to afford a cigarette and the sales amount -in other words consumption- a significant negative correlation of 92.1% was detected between the two variables ( $r = -0.921$ ;  $p < 0.001$ ). On the other hand, such significant correlation was not found between pack price and sales amount and ( $r = -0.328$ ;  $p > 0.05$ ), where different types of taxes played the main role to form the real sales price.

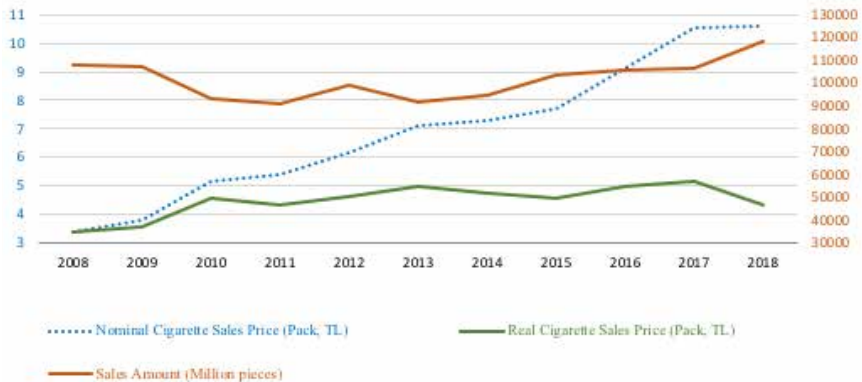
**Table 1:** Excise Tax Taken from Tobacco Products (2002-2019)

Date	Proportional (Relative) Excise Tax (%)	Minimum Fixed Tax (TL/Package)	Fixed Tax (TL/Package)
29.12.2009	63.00	2.65	
12.10.2011	65.00	2.90	
01.01.2013	65.25	3.15	0.09
03.07.2013	65.25	3.23	0.0922
01.01.2014	65.25	3.75	0.13
01.07.2014	65.25	3.94	0.1366
01.01.2015	65.25	3.99	0.1866
01.07.2015	65.25	4.21	0.1968
01.01.2016	65.25	4.42	0.2468
01.07.2016	65.25	4.56	0.2546
01.12.2016	65.25	4.56	0.3246
01.01.2017	65.25	4.86	0.3246
03.07.2018	63.00	5.60	0.42
01.01.2019	67.00	0	0.42
01.05.2019	67.00	5.35	0.42
03.07.2019	67.00	5.79	0.4539
15.08.2019	67.00	7.79	0.4686

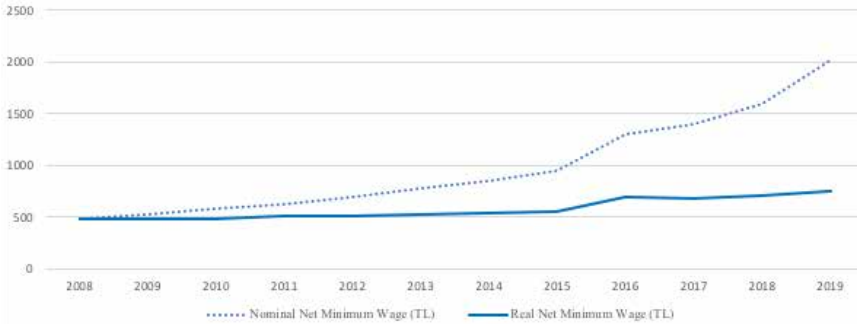
Ref: Çakmaklı et al., Administration of Income Website (Date of Access: 08.12.2019)

**Table 2:** Domestic Cigarette Sales and Retail Price

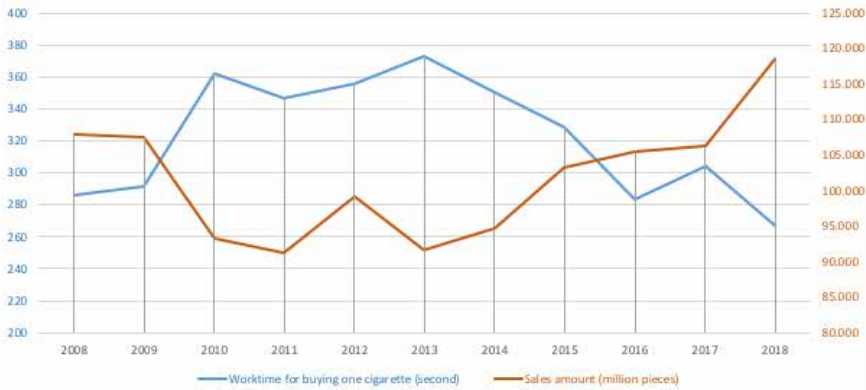
Years	Domestic Sales				
	Sale Amount (Million Pieces)	Retail Sales Revenue (TL)	Retail Sales Revenue (US\$)	Nominal Cigarette Sale Price (Package, TL)	Real Cigarette Sale Price (Package, TL)
2008	107,858	18,342,201,352	14,186,758,051	3.40	3.40
2009	107,554	20,402,965,760	13,188,730,291	3.79	3.56
2010	93,354	24,041,960,283	16,024,127,731	5.15	4.54
2011	91,217	24,598,105,744	14,729,404,637	5.39	4.31
2012	99,257	30,588,330,136	17,064,619,323	6.16	4.63
2013	91,659	32,646,104,243	17,170,321,643	7.12	4.99
2014	94,681	34,624,817,147	15,825,883,350	7.31	4.73
2015	103,210	39,648,844,291	14,576,673,808	7.68	4.57
2016	105,488	47,950,493,321	15,871,077,640	9.09	4.99
2017	106,223	55,966,662,596	15,343,065,249	10.54	5.16
2018	118,541	62,676,353,709	13,021,089,134	10.57	4.31



**Figure 1:** Nominal and Real Cigarette Prices per Package and Change of Cigarette Sales Amount, 2008-2018



**Figure 2:** Minimum Wage Changes, 2008-2019.



**Figure 3:** Change of the time (seconds) of a person working with minimum wage to afford one piece of cigarette and the sales amount, 2008-2018.

## DISCUSSIONS AND CONCLUSIONS

Tobacco use, which is one of the preventable risk factors of noncommunicable diseases, which ranks first among the causes of death, is accepted as the cause of approximately 15% of all deaths worldwide (IHME, 2020). In order to prevent these deaths and health problems which are caused by tobacco use, the Tobacco Control Framework Agreement was prepared by the WHO and the MPOWER criteria and the anti-tobacco policy bundle were announced.

Turkey is the first country who have completed MPOWER criteria by strictly implementing anti-tobacco policy. One of the most effective policies implemented under these criteria was tobacco taxes.

The WHO regards taxation as a global issue, not just a national issue. Globally, only 32 countries (10% of the world's population) tax cigarettes at the level of WHO recommendation, which is 75% or more of the retail price (Soneji et al., 2019). There is not a uniform policy about the amount of taxes. Actually, what matters is not the tax amount, but the final retail price of cigarettes. Smaller taxes help keep the price of cigarettes lower in low-income countries compared with middle- and high-income countries. For example, mean prices of a pack of cigarettes in low- and middle-income countries in 2016 were virtually identical: \$1.94 in low-income countries and \$1.95 in high-income countries. However, middle-income countries levied a mean of \$2.35 in taxes (55% of pack price), whereas low income countries levied a mean of \$1.15 in taxes (37% of pack price) (Soneji et al., 2019).

In our country, besides the value added tax (VAT), excise tax is applied to tobacco products and the tax burden reflected in the retail price in 2018 reached 81.4% (WHO, 2019). In addition to VAT, which is a relative tax, excise tax is applied as a fixed tax expressing both relative and fixed tax. In addition to the relative tax, the fixed tax application prevents the prices from going under a certain level. Excise tax is important to attract the attention of the consumer directly to the current product. The effects of excise taxes on consumption and health is proportional to their size. Large tax increases signal to consumers that these products are dangerous and lead to large reductions in their use (Chaloupka et al., 2019).

In 2018 the tobacco sales revenue has reached 62,676,353,709 TL. According to the tax rate applied in our country, it is seen that there is a tax income of around 50 billion TL (81.4%). This revenue generates a considerable amount of Turkey's budget income.

As pointed out above, besides the specific effects of tax types, they clearly help to increase the retail price. Experiences show that the more the retail price increases, the more decrease in consumption occurs. The common view is that the increase of tax burden in cigarette prices is expected to decrease tobacco consumption over the years. As we stated earlier, we were unable to analyze the effect of sole tax for its share in the real pack price was not easy to estimate throughout the years. Since taxes show their major effect by increasing the price, we preferred to analyze the effect of total sale price. In this regard par-



allel with the common view, our hypothesis was that the increase of cigarette pack prices is expected to decrease tobacco consumption over the years.

As shown in Figure 1, there was a significant impact in this direction in 2010 and 2013 in Turkey. However, when all the years within the scope of this study are examined, this effect has not been steady.

It gives the impression that there are some other dominant factors other than the price of cigarettes which affects the cigarette consumption. Also, although a nominal price increase occurs regularly, the inflation-free real price increase is not regular. In other words, real price increases have been realized rarely, at least not every year. Literature indicates that, infrequent increases in tax rates have contributed to continued affordability of cigarettes, especially in low- and middle-income countries, thus do not result in decreased consumption (Soneji et al., 2019).

It can be assumed that consumers with a high income are less effected by the increased price. In our country, the majority of smokers are supposed to be those with less income, who might be easily affected. That is why this study examines the relationship between consumption and price as well as purchasing power.

A major part of the population that consumes cigarettes works for minimum wage, so is affected by the increase of cigarette prices. We used the minimum wage as a measure of purchasing power. To have an objective criterion, using the time that a person who receives the minimum wage had to work to earn a cigarette piece is preferred as a measure.

As shown in Figure 2, the minimum wage has increased nominally over the years. However, the real increase generally draws a horizontal line except in 2016. In 2016, there was a significant minimum wage increase. We know that was a promise during the general election, and the increase was made just after that.

Matching the Figure of changes in the sales amount of cigarettes over the years with the Figure showing the working time of a person on minimum wage to afford one cigarette gives us an interesting view. In other words, the necessary time to be able to buy a cigarette and the consumption amounts are given in the same Figure to see their relation. As seen in Figure 3, these two lines are mirror images of each other. Whenever one increases, the other decreases.

es. Statistical analysis revealed negative correlation of 92.1% between the two variables ( $r:-0.921$ ).

Therefore, it appears that cigarette consumption has a stronger relationship with purchasing power than sales price itself. That is to say that increased sale amount in 2016 in spite of increased price was due to increased purchasing power. The real minimum wage increase in 2016 caused a marked decrease in working time per cigarette. That implies a relative decrease in price. Thus, it resulted in an increase in consumption. During this period, no tax increase occurred affecting cigarette prices at the same rate. The effect of the price increase in 2017 was manifested by the decrease in the rate of sales amount, but the real cigarette price declined in 2018 to the levels of 2011 and thus the sales amount increased rapidly.

Baum et al. claimed that for every one-dollar increase in cigarette tax per pack country life expectancy increased by 1 year (95% CI 0.60 to 1.40 years) over the long run, with the first 6-month increase in life expectancy taking 10 years to realize (Baum et al., 2019). In light of our findings, we suggest that this statement should be revised, for affordability is more effective than the tax itself. So, for tobacco control, it is better to focus on the purchasing power of the target community rather than the price of cigarettes with or without taxes. To keep tax impact on cigarette sales we need to balance it with the purchasing power of the majority of smokers.

**REFERENCES**

- American Cancer Society (2019, December 17). <https://tobaccoatlas.org/country/turkey/>
- Baum, A., Aguilar-Gomez, S., Lightwood, J., Bruzelius, E., Glantz, S. A., Basu, S. (2019). Estimating The Long-Run Relationship Between State Cigarette Taxes And County Life Expectancy. *Tobacco Control*, 29, 81-88.
- Çakmaklı, C., Demiralp, S., Yeşiltaş, S., Yıldırım, M. A. (2018). Tütün Ürünlerine Uygulanan Dolaylı Vergilerin Enflasyona Etkileri. Koç University - TÜSİAD Economic Research Forum Working Paper Series.
- Chaloupka, F. J., Powell, L. M., Warner, K. E. (2019). The Use of Excise Taxes To Reduce Tobacco, Alcohol, And Sugary Beverage Consumption. *Annual Review of Public Health*, 40,187-201.
- Institute for Health Metric and Evaluation - IHME (2020, September 11). Global Burden of Disease Result Tool. IHME database. <http://ghdx.healthdata.org/gbd-results-tool>
- Ministry of Agriculture and Forestry (2019, December 10). Sigara Üretimi, İthalatı, İç Satışı ve İhracatı. <https://www.tarimorman.gov.tr/TADB/Menu/22/Tutun-Ve-Tutun-Mamulleri-Daire-Baskanligi>
- Ministry of Family, Labor and Social Services (2019, December 17). Asgari Ücretin Net Hesabı ve İşverene Maliyeti. <https://www.ailevecalisma.gov.tr/tr-tr/askari-ucret/>
- Ministry of Treasury and Finance (2019, December 12). Ekonomik Göstergeler. <https://www.hmb.gov.tr/bumko-ekonomik-gostergeler>
- Revenue Administration (2019, December 12). Hedeflenen ve Gerçekleşen Bütçe Vergi Gelirleri (1950-2018). [https://www.gib.gov.tr/sites/default/files/fileadmin/user\\_upload/VI/GBG/Tablo\\_47.xls.htm](https://www.gib.gov.tr/sites/default/files/fileadmin/user_upload/VI/GBG/Tablo_47.xls.htm)
- Revenue Administration (2019, December 27). Özel Tüketim Vergisi ve Oranları. [https://www.gib.gov.tr/sites/default/files/fileadmin/mevzuatek/otv\\_oranlari\\_tum/ozeltuketimoranlari-Open-Page.htm](https://www.gib.gov.tr/sites/default/files/fileadmin/mevzuatek/otv_oranlari_tum/ozeltuketimoranlari-Open-Page.htm)
- Soneji, S., Wills, T. A. (2019). Challenges and Opportunities for Tobacco Control Policies in the 21st Century. *JAMA pediatrics*, 173,723-725.
- World Health Organization, Research for International Tobacco Control (2008). *Who Report On The Global Tobacco Epidemic, 2008: The MPOWER Package*. Switzerland: World Health Organization.
- World Health Organization (2019, December 27). WHO Report on The Global Tobacco Epidemic Country Profile: Turkey. [https://www.who.int/tobacco/surveillance/policy/country\\_profile/tur.pdf?ua=1](https://www.who.int/tobacco/surveillance/policy/country_profile/tur.pdf?ua=1)
- World Health Organization (2010). *WHO Technical Manual on Tobacco Tax Administration*. World Health Organization. Switzerland: World Health Organization.





# Tuberculosis Treatment Services Satisfaction and Associated Factors among Patients Attending Public Health Centers in Kolfe Keranio, Addis Ababa, Ethiopia

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Fikru T. JALETA<sup>2</sup>

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## ABSTRACT

Giving tuberculosis patients a chance to express their feelings about the care they receive is a crucial tool to plan important intervention to improve the service provision. The aim of this study was to assess patient satisfaction level and associated factors on tuberculosis treatment service in public health centers of Kolfe Keranio, Addis Ababa, Ethiopia. A cross sectional study was conducted on 484 conveniently included participants from March 1-30, 2016 using a structured questionnaire. SPSS version 20 was used for analysis and to determine the presence of association, variables having  $p \leq 0.25$  at bivariate analysis were fitted to multivariate analysis. Odds Ratio, P-value and 95% Confidence Interval were used to show the association of variables ( $p < 0.05$ ).

The overall level of patient satisfaction was 73.8%. However, 55.2% of the patients were dissatisfied with the physical environment and 31.4% were displeased with availability of diagnostic and medication services. Satisfaction was significantly associated with age, educational status, family monthly in-

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come, perceived health condition of the patient, time took to reach to the health facility, perceived sufficient time to spend with the provider and perceived consultation and relational empathy of the provider. Majority of the patients were satisfied with the service they received. Nevertheless, lower satisfaction was observed physical environment of the health centers, provision of diagnostic facility and medical services.

**Keywords:** Tuberculosis, Satisfaction, Ethiopia.

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## INTRODUCTION

Tuberculosis (TB) is an infectious disease caused by *Mycobacterium tuberculosis* which affects the lungs pulmonary TB (PTB) but can affect other parts of the body extra pulmonary TB (EPTB) (WHO, 2014).

The African Region had 28% of the worlds' cases in 2014. Ethiopia is among the 22 high TB burden and 27 high Multi drug resistant (MDR) TB burden countries in the world (WHO, 2015). The National Tuberculosis Program (NTP) efforts to control TB in Ethiopia began in the early 1960s and adopted the WHO recommended Directly Observed Treatment, Short Course (DOTS) strategy since 1992 (FMOH, 2008).

Satisfaction is the psychological state that results from confirmation or disconfirmation of expectations with reality (Weingarten et al., 1995). Patient satisfaction is an integral component of service quality which is a public health concern in developing world. It is also an issue addressed as a component of the Ethiopia Health Sector Development Program (HSDP) and an intrinsic part of the program (Billingsley et al., 2011; Eticha et al., 2014; Mainz, 2003). According to Donabedian, patient satisfaction should be investigated since it is an objective of care, a consequence of that care (outcome) that can contribute to the effects of care (Donabedian, 1987). Satisfaction surveys inform purchasing decision, stimulate proposals to restructure service delivery and can be used to evaluate the effects of policy change (Avis et al., 1995).

Studies in the Meerut district of Uttar Pradesh, Sudan and Bahirdar city reported 67.8%, 56.2% and 53.8% satisfaction level of patients with TB treatment service. Non suitable opening time, rude behavior of the staff, long distance of the health facilities, non-availability of health staff, long waiting time,

type of treating cadre and poor cleanliness and comfortableness of waiting area were among the dissatisfaction issues (Gupta, 2015; Kassie et al., 2015; Mohamed et al., 2014).

Patients who are not satisfied with the healthcare they received were likely to face barriers to treatment adherence (Roberts, 2002; Schaffler et al., 1996). Non-adherence to TB treatment can result in an emergence of new strains, prolonged infectiousness, drug resistance and poor treatment outcomes (Tesfahuneygn et al., 2015). Satisfaction with services is especially important for patients undergoing treatment for TB because they must persist with six to eight months long therapeutic regimen (Wadhwa, 2002).

Therefore, the aim of this study was to assess patient satisfaction level and associated factors on tuberculosis treatment service in public health centers of Kolfe Keranio, Addis Ababa, Ethiopia to help the improvement of the service provision.

## **METHODOLOGY**

The study was conducted in Kolfe Keranio, Addis Ababa, the capital city of Ethiopia. The district has 15 woredas with a total population of 546,219 as of 2011.

An institution based cross sectional study that uses quantitative method of data collection was employed from March.1-30, 2016.

For this study, an entire population sampling technique (survey) was employed. This sampling technique was used because the number of the study population in the health care facilities was small which is manageable for data collection and analysis. A total of 484 TB patients were studied from 9 health centers after excluding those study participants who did not fulfill the eligibility criteria.

The inclusion criteria of all TB patients, whose age is 15 years and above, started TB treatment service two weeks before the study period and coming on the data collection period was castoff.

A structured questioner which is developed after reviewing relevant literatures and similar studies was used for the study purpose (Eticha et al., 2014; Nezenega & Tafere, 2013). The questionnaire was designed to obtain information on five parts, which include: - socio- demographic and economic status, clinical characteristics of the patient, patient experience related factors, patient health care provider interaction and satisfaction level of the patients with different aspects of the service.



The satisfaction scale questions consist of 10 items, extensively validated in studies of patient satisfaction and highly relevant to the context of tuberculosis treatment services (Portela et al., 2014). The 10 items were then categorized in to 4 dimensions termed Convenience items, Availability of diagnostic and medication service, Communication and relationship with the health care provider and Physical environment items.

With the Consultation and Relational Empathy (CARE) tool patients were asked 10 questions to rate different aspects of empathy (Birhanu et al., 2010).

The final version of the questionnaire was translated into Amharic by language experts. It was translated back to English to check quality of the translation. The questionnaire was pre- tested, and modification was made based on the problems identified.

Three diploma nurses who speak the local language Amharic were recruited for data collection. One laboratory technologist was also supervising the data collection with the principal investigator. Training was given for data collectors on interview techniques and timely supervision of data collectors was done during data collection.

Data was entered in to EpiData version 3.1, exported to SPSS version 20, cleaned and analyzed. Bivariate analysis was used to assess the presence of association between independent variables and patient satisfaction. Variables having p value < 0.25 at bivariate analysis were fitted to multivariate analysis.

The study has obtained ethical clearance from ethical review board of Jimma University, College of Health Sciences with reference number HRPGC/4090/2016. Verbal informed consent was obtained from each study subjects while the study subjects right to refuse was respected.

### **Operational Definition**

The level of patient satisfaction: - The level of patient satisfaction on TB treatment services were scored on a five-point Likert scale (1-Strongly dissatisfied, 2- dissatisfied, 3- neutral, 4-satisfied, and 5-Strongly satisfied) and summed to give an overall satisfaction score from 20% to 100%. 75% and above satisfaction scores were categorized as “satisfied” and satisfaction scores less than 75% were categorized as “dissatisfied” (Sagaro et al., 2015).

## RESULT

### Socio Demographic Characteristics

With a response rate of 98.9%, 484 adult TB patients were interviewed of which 257 (53.1%) were female. The mean age of participants was 32.5 ( $\pm 12.318$ ). Four hundred twenty seven (88.2%) of them live in Addis Ababa. Two hundred eleven (43.6%) were single and 207 (42.8%) were married. Only 61 (12.6%) of the patients were illiterate and 190 (39.3%) were unemployed (Table 1).

**Table 1:** Socio Demographic Characteristics of the TB Patients.

Variable	Category	Frequency	Percentage (%)
<b>Sex</b> (N= 484)	Male	227	46.9
	Female	257	53.1
<b>Age group</b> (N= 484)	15-24	160	33.1
	25-34	178	36.8
	35-44	56	11.6
	$\geq 45$	90	18.6
<b>Residence</b> (N= 484)	Addis Ababa	427	88.2
	Out of Addis Ababa	57	11.8
<b>Marital status</b> (N= 484)	Single	211	43.6
	Married	207	42.8
	Widowed	38	7.9
	Divorced	28	5.8

<b>Ethnicity (N= 484)</b>	Amhara	159	32.9
	Guragie	123	25.4
	Oromo	119	24.6
	Tigre	38	7.9
	Silte	36	7.4
	Others	9	1.9
<b>Educational status (N= 484)</b>	Cannot read and write	61	12.8
	Can read and write	54	11.2
	Grade 1-6	130	26.9
	Grade 7-12	181	37.4
	Diploma and above	58	12.0
<b>Occupational status (N= 484)</b>	Civil Servant	31	6.4
	Student	44	9.1
	Merchant	53	11.0
	Day labourer	58	12.0
	Private employee	104	21.5
	Unemployed	194	40.1
<b>Family monthly Income (N= 484)</b>	< 662.40ETB	121	25.0
	662.50 – 1199.99ETB	95	19.6
	1200.00-2386.99ETB	147	30.4
	≥452387.00ETB	121	25.0
<b>Currently living with</b>	Living alone	69	14.3
	Living with family	366	75.6
<b>(N= 484)</b>	Living with relative	49	10.1
<b>Size of the family (N= 415)</b>	<4persons	227	54.7
	4-7persons	159	38.3
	8person	29	7.0

### Clinical Characteristics of TB Patients

Four hundred nine (84.5%) of the patients were new cases. From 75 (15.5%) relapse patients more than 53 (70.7%) had completed the previous treatment. Three hundred ten (64.0%) of the patients were on the continuation phase and the other 174 (36.0%) were on the intensive phase. Two hundred sixty seven (55.2%) perceived their current health status as well. From 425 (87.8%) respondents tested for HIV 100 (23.5%) were positive (Table 2).

**Table2:** Clinical Characteristics of the TB Patients.

Variable	Category	Frequency	Percentage (%)
<b>Patient category (N=484)</b>	New	409	84.5
	Relapse	75	15.5
<b>Completed previous treatment (N=75)</b>	Yes	53	70.7
	No	22	29.3
<b>Treatment phase (N=484)</b>	Intensive	174	36.0
	Continuation	310	64.0
<b>Perceived health condition (N=484)</b>	Very well	133	27.5
	Well	267	55.2
	Poor	84	17.4
<b>Tested for HIV (N=484)</b>	Yes	425	87.8
	No	59	12.2
<b>HIV Sero-status (N=484)</b>	Positive	100	23.5
	Negative	325	76.5
	Unknown	59	12.2

### Patients' Experience on TB Treatment Service

One hundred forty eight (30.6%) of the patients spend  $\geq 40$  minutes to get to the health institution. After reaching the health center, 47.9% of the patients waited from 5 to 7 minutes until contact with the health care provider (Table 3).

**Table3:** Experience of TB Patients Attending the Health Centers

Variable	Category	Frequency	Percentage (%)
Distance/ Time took to reach the health center	<20minutes	100	20.7
	20-24minutes	121	25.0
	25-39minutes	115	23.8
	$\geq 40$ minutes	148	30.6
Waiting time	<5minutes	117	24.2
	5-7minutes	232	47.9
	$\geq 8$ minutes	135	27.9

### Patient Health Care Provider Interaction

Two hundred sixty five (54.8%) of the patients were not seen by the same health care provider while following their treatment. Four hundred twenty one (87.0%) of the patients perceived that they got sufficient time to spent with the health care provider. Two hundred thirty one (47.7%) of the respondents perceived CARE of the health care provider was medium (Table 4).

**Table 4:** Patient Health Care Provider Interaction During Service Provision

Variable	Category	Frequency	Percentage (%)
Seen by the same health care provider	Yes	219	45.2
	No	265	54.8
Perceived sufficient time spent with the health care provider	Yes	421	87.0
	No	63	13.0
Perceived CARE of the provider	High	187	38.6
	Medium	231	47.7
	Low	66	13.6

### The Level of Patient Satisfaction with the Dimensions of TB Treatment Services

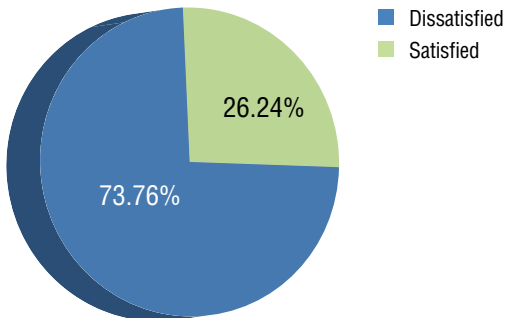
Three hundred sixty two (74.8%) of the patients were satisfied with the convenience items and 354 (73.1%) were satisfied with communication and relationship with the health care provider items. However, 55.2% of the patients were dissatisfied with the physical environment items. One hundred fifty two (31.4%) of TB patients were dissatisfied with the availability of diagnostic and medication services items (Table 5).

**Table5:** The Level of Patient Satisfaction with Dimensions of TB Treatment Services

Dimension s of satisfaction	Frequency and (Percentage)	
	Satisfied	Dissatisfied
Convenience	362 (74.8)	122 (25.2)
Communication and relationship with the health care provider	354 (73.1)	130 (26.9)
Availability of diagnostic and medication services	332 (68.6)	152 (31.4)
Physical environment	217 (44.8)	267 (55.2)

## Overall Patient Satisfaction with TB Treatment Service in Public Health Centers of Kolfe Keranio Sub City

The finding of the study showed that the overall level of TB patients' satisfaction with the Tuberculosis treatment services rendered at nine public health centers was 73.8% (Figure1).



**Figure 1:** Overall patient satisfaction with TB treatment service.

### Factors Associated with TB Patient Satisfaction

Tuberculosis patients who are in the age group 25-34 have shown 2.02 times higher satisfaction level than those who are in the age group 15-24 (95%CI: 1.08-3.78). Those who had completed grade 7-12 and had diploma and above educational level have shown 0.38 and 0.16 times lower satisfaction level than those who cannot read and write (95%CI: 0.14,0.99) and (95%CI: 0.05,0.47) respectively.

Similarly, TB patients who had family monthly income above 2387.00ETB have shown 0.36 times lower satisfaction level than those with family monthly income below 662.40ETB (95%CI: 0.17-0.78).

TB patients who perceive they are in a very well health condition have shown 2.71 times higher satisfaction level than those with perceived poor health condition (95%CI: 1.21- 6.10). Patients who spend  $\geq 40$  minutes to get to the health institution have shown 0.17 times lower satisfaction level than those with travel time  $\leq 20$  minutes (95%CI: 0.08-0.38).

TB patients who perceive they have sufficient time to spend with the provider have shown 2.17 times higher satisfaction level than those who perceive they have insufficient time to spent with the provider (95%CI: 1.05-4.51).

In addition, those patients with perceived medium and low CARE of the provider have shown 0.19 and 0.16times lower satisfaction level than those who have perceived high CARE of the health care provider (95%CI:0.10-0.35) and (95%CI: 0.07-0.37) respectively (Table 6).

**Table 6:** Bi-variate and Multivariate Analysis Showing Factors Associated with Patient Satisfaction

Variable	Category	Satisfaction		COR (95%CI)	P value	AOR (95%CI)		
		Satisfied N (%)	Dissatisfied N (%)					
Sex	Male	176 (77.5)	51 (22.5)	1.44 (0.96, 2.19)	0.08	1.59 (0.95,2.68)		
	Female	181 (70.4)	76 (29.6)	1				
Age group	15-24	110 (68.8)	50 (31.2)	1	0.03*	2.02 (1.08,3.78)		
	25-34	140 (78.7)	38 (21.3)	1.68 (1.03,2.73)				
	35-44	41 (73.2)	15 (26.8)	1.24 (0.63,2.45)				
	≥45	66 (73.3)	24 (26.7)	1.25 (0.70,2.22)				
Residence	Addis Ababa	319 (74.7)	108 (25.3)	1.48 (0.82, 2.67)	0.25	1.58 (0.73,3.43)		
	Outside Addis Ababa	38 (66.7)	19 (33.3)	1				
Educational status	Cannot read and write	51 (83.6)	10 (16.4)	1	0.60	0.73 (0.22,2.40)		
	Can read and write	46 (85.2)	8 (14.8)	1.13 (0.41,3.10)				
	Grade 1-6	106 (81.5)	24 (18.5)	0.87 (0.39,1.95)			0.26	0.56 (0.21,1.52)
	Grade 7-12	124 (68.5)	57 (31.5)	0.43 (0.20,0.90)				
	Diploma and above	30 (51.7)	28 (48.3)	0.21 (0.09,0.49)			0.00**	0.16 (0.05,0.47)
Families annual monthly Income	< 662.4 ETB	100 (82.6)	21 (17.4)	1	0.28	1.62 (0.68,3.86)		
	662.5-1199.9ET B	80 (84.2)	15 (15.8)	1.12 (0.54,2.31)				
	1200.0-2386.9ET B	107 (72.8)	40 (27.2)	0.56 (0.31,1.02)			0.07	0.51 (0.25,1.05)
	≥2387.0ET B	70 (57.9)	51 (42.1)	0.29 (0.16,0.52)				



<b>Patient category</b>	New	295 (72.1)	144 (27.9)	1		
	Relapse	62 (82.7)	13 (17.3)	1.84 (0.98,3.48)	0.12	1.88 (0.85,4.19)
<b>Treatment phase</b>	Intensive	121 (69.5)	53 (30.5)			
	Continuation	236 (76.1)	74 (23.9)	1.40 (0.92, 2.15)	0.08	1.67 (0.94,2.97)
<b>Perceived health condition</b>	Very well	109 (82.0)	24 (18.0)	2.80 (1.50,5.25)	0.02*	2.71 (1.21,6.10)
	Well	196 (73.4)	71 (26.6)	1	0.21	1.57 (0.77,3.19)
	Poor	52 (61.9)	32 (38.1)	1		
<b>HIV sero status</b>	Positive	78 (78.0)	22 (22.0)	1		
	Negative	228 (70.2)	97 (29.8)	0.66 (0.39,1.13)	0.15	0.61 (0.31,1.20)
	Unknown	51 (86.4)	8 (13.6)	1.80 (0.74,4.35)	0.38	1.64 (0.54,4.95)
<b>Time took to reach the HC</b>	<20minutes	84 (84.0)	16 (16.0)	1		
	20-	101	20	4.34	0.70	0.85
	24minutes	(83.5)	(16.5)	(2.32,8.11)		(0.37,1.96)
	25-39minutes	91 (79.1)	24 (20.9)	4.18 (2.34,7.45)	0.06	0.45 (0.20,1.04)
	≥40minutes	81 (54.7)	67 (45.3)	3.14 (1.80,5.46)	0.00** *	0.17 (0.08,0.38)
<b>Seen by the same health care provide</b>	Yes	169 (77.2)	50 (22.8)	1.38 (0.92, 2.09)	0.70	1.11 (0.65,1.90)
	No	188 (70.9)	77(29.1)	1		
<b>Perceived sufficient time spent with the provider</b>	Yes	324 (77)	97 (23.0)	3.04 (1.76,5.23)	0.04*	2.17 (1.05,4.51)
	No	33(52.4)	30(47.6)	1		
<b>Perceived CARE of the provider</b>	High	169 (90.4)	18 (9.6)	1		
	Medium	147 (63.6)	84 (36.4)	0.19 (0.11,0.3)	0.00** *	0.19 (0.10,0.35)
	Low	41 (62.1)	25 (37.9)	0.18 (0.09,0.35)	0.00** *	0.16 (0.07,0.37)

\* P-value<0.05, \*\* P-value <0.01 and \*\*\* P-value < 0.001. 1= Reference for category

## DISCUSSION

The overall level of TB patient satisfaction with TB treatment service in Kolfe Keranio, Addis Ababa (73.8%) was lower than studies conducted in Brazil (89.2%) and India (78.6%) (Portela et al., 2014; Srivastav & Mahajan, 2014). Geographical and cultural variation might be the possible reasons for the differences. It was also lower than study conducted in Sidama (90%) (Nezenega & Tafere, 2013) but higher than the finding of Bahirdar town (53.8%) (Kassie et al., 2015). The differences could be due to apparent heterogeneity of the evaluations and computing way of the overall satisfaction.

Three hundred sixty two (74.8%) and 73.1% of TB patients were satisfied with the convenience items then communication and relationship with the provider, respectively. However, 31.4% and 55.2 % of TB patients were dissatisfied with availability of diagnostic and medication services and the physical environment. These findings were consistent with studies conducted in Brazil. Similar to the finding in Uganda it shows lower satisfaction of patients on measures taken to assure privacy and information and clarification during first consultation (Babikako et al., 2011; Portela et al., 2014). Likewise, dissatisfaction was seen in cleanliness of waiting area on 55.8% of TB patients in Bahirdar town (Kassie et al., 2015). The reason for the consistency might be the similarity in TB patients' perception of cleanliness of facilities and perceived concentration of the health care providers while communicating.

TB patients who are in the age group 25-34 have shown 2.02 times higher satisfaction level than those in the age group 15-24. The study also revealed that TB patients who had completed grade 7-12 and had diploma and above educational level have shown 0.38 and 0.16 times lower satisfaction level than those who cannot read and write. This finding agrees with findings of a study conducted in Brazil. But education was not significantly associated with satisfaction in other similar studies in Sudan and Southern Nigeria (Mohamed et al., 2014; Onyeonoro et al., 2015; Portela et al., 2014). The reason could be because they are more aware of the significant progress made in TB management program in Ethiopia and have higher expectation of the service to be up to standard.

TB patients who had family monthly income above 2387.00ETB have shown 0.36 times lower satisfaction level than those with family monthly income be-

low 662.40ETB. This finding was consistent with a study conducted in Sudan in which patients with no income were more satisfied with TB care they receive (Mohamed et al., 2014). Patients had access to TB treatment service free of charge; this may explain the high satisfaction of patients with low income. Sex and residence were not significant association with satisfaction of TB patients which is similar to a study performed in Sudan (Mohamed et al., 2014). In contrast, in other study performed in central Shewa, residence appeared to be significantly associated with satisfaction (Birhanu et al., 2010). These differences might be attributed to variations in study settings.

TB patients who perceive they are in a very well health condition have shown 2.71 times higher satisfaction level than those with perceived poor health condition which is consistent with a study finding in Sidama (Nezenega & Tafere, 2013). Those patients who felt very well health condition might perceive the treatment they were taking was improving their health condition which might make them more pleased.

Patient category, treatment phase and HIV status were not significant predictors of satisfaction. Consistently patient category and HIV status were not significantly associated with satisfaction of TB patients in other studies (Portela et al., 2014). However, HIV status and treatment phase were significant predictors of satisfaction in another similar study (Nezenega & Tafere, 2013). The reason could be the increasing awareness of TB patients about the importance of TB treatment and its follow up.

TB patients who spend  $\geq 40$  minutes to get to the health institution have shown 0.17 times lower satisfaction level than those with travel time  $\leq 20$  minutes. This finding disagrees with a study in Southern Nigeria where living near health facility was found to be associated with low satisfaction. It is because TB has remained one of the few stigmatized disease conditions in the country (Onyeonoro et al., 2015). However, the lower satisfaction level of TB patients who live far from the health centers could be due to higher transportation cost and cost for food and drinks. Waiting time was not significantly associated with overall satisfaction level which is inconsistent with other studies (Eticha et al., 2014; Nezenega & Tafere, 2013). This might be because of the enrolment of health care providers to work only in the TB room which is suitable to give the service as soon as the patients arrive.

TB patients who perceive they have sufficient time to spend with the provider have shown 2.17 times higher satisfaction level than those who perceive they have insufficient time to spend with the provider. This finding was similar with the findings of studies conducted in south Ethiopia and central Shewa (Birhanu et al., 2010; Eticha et al., 2014). TB patients with perceived medium and low CARE of the provider have shown 0.19 and 0.16 times lower satisfaction level than those who have perceived high CARE of the health care provider which agrees with similar studies (Birhanu et al., 2010; Nezenega & Tafere, 2013). Since TB care involve prolonged contact between provider and patient, decreased perceived CARE will likely result in lower satisfaction.

Being attended by the same health care provider was not significantly associated with TB patient satisfaction unlike the study finding of South Ethiopia (Eticha et al., 2014). This could be given elucidation that currently TB treatment service is being provided by one or two fixed personnel in most of the health facilities.

## CONCLUSION

The overall patient satisfaction towards Tuberculosis treatment services (73.8%) was moderate as compared to similar studies. Satisfaction was significantly associated with age, educational status, family monthly income, perceived health condition of the patient, time took to reach to the health facility, perceived sufficient time to spend with the provider and perceived consultation and relational empathy (CARE) of the provider.

Attention should be given to the physical environment and arranging facilities for diagnosis and treatment service. Trainings should be given for the providers on patient handling practice and provider empathy during consultation should be cultivated. Provision of TB drugs at lower level of the health care system hierarchy near to the community may be important in enhancing patient satisfaction. Conducting periodic assessment of TB treatment services, especially from the patients' satisfaction perspective is crucial to improve the service provision.

**REFERENCES**

- Avis, M., Bond, M., Arthur, A. (1995). Satisfying solutions? A review of some unresolved issues in the measurement of patient satisfaction. *Journal of Advanced Nursing*, 22,316-322.
- Babikako, H. M., Neuhauser, D., Katamba, A., Mupere, E. (2011). Patient satisfaction, feasibility and reliability of satisfaction questionnaire among patients with pulmonary tuberculosis in urban Uganda: a cross-sectional study. *Health Research Policy and Systems*, 9,6.
- Billingsley, K. M., Smith, N., Shirley, R., Achieng, L., Keiser, P. (2011). A quality assessment tool for tuberculosis control activities in resource limited settings. *Tuberculosis*, 91,49-53.
- Birhanu, Z., Assefa, T., Woldie, M., Morankar, S. (2010). Determinants of satisfaction with health care provider interactions at health centres in central Ethiopia: A cross sectional study. *BMC Health Services Research*, 10,78.
- Donabedian, A. (1987). Commentary on some studies of the quality of care. *Health Care Financing Review*, 1987(Suppl),75.
- Eticha, B. M., Atomsa, A., & BirtukanTsehaineh, T. M. B. (2014). Patients' perspectives of the quality of tuberculosis treatment services in South Ethiopia. *American Journal of Nursing*, 3,48-55.
- Federal Ministry of Health. (2008). Manual for Tuberculosis, Leprosy and TB/HIV prevention and control program. Addis Ababa: FMOH.
- Gupta, S. (2015). Evaluation of patient satisfaction level undergoing dots therapy in meerut District of Uttar Pradesh. *Journal of Advanced Medical and Dental Sciences Research*, 3,34.
- Kassie, M., Aragaw, A., Belay, A. (2015). Assessment of the quality of directly observed treatment short-course of tuberculosis in Bahir Dar City Administration, North West Ethiopia. *Sci J Public Health*, 3,6-13.
- Mainz, J. (2003). Defining and classifying clinical indicators for quality improvement. *International Journal for Quality in Health Care*, 15,523-530.
- Mohamed, E., Ounsa, M., Al Mansour, M., Alzahrani, M., Abdalla, S., Medani, K., Sidahmed, H., Sami, W. (2014). Patients' satisfaction with tuberculosis services of directly observed therapy programs in the Gezira state of Sudan *Archives of Clinical Infectious Diseases* 9,1-5.
- Nezenega, Z. S., Tafere, T. E. (2013). Patient satisfaction on tuberculosis treatment service and adherence to treatment in public health facilities of Sidama zone, South Ethiopia. *BMC Health Services Research*, 13,110.
- Onyeonoro, U. U., Chukwu, J. N., Nwafor, C. C., Meka, A. O., Omotowo, B. I., Madichie, N. O., Ogbudebe, C., Ikebudu, J. N., Oshi, D. C., Ekeke, N. (2015). Evaluation of patient satisfaction with tuberculosis services in Southern Nigeria. *Health Services Insights*, 8.
- Portela, M. C., Lima, S. M. L., Brito, C., Ferreira, V. M. B., Escosteguy, C. C., Vasconcellos, M. T. L. D. (2014). Tuberculosis control program and patient satisfaction, Rio de Janeiro, Brazil. *Revista de Saude Publica*, 48,497-507.
- Roberts, K. J. (2002). Physician-patient relationships, patient satisfaction, and antiretroviral medication adherence among HIV-infected adults attending a public health clinic. *AIDS Patient Care and STDs*, 16,43-50.
- Sagaro, G. G., Yalew, A. W., Koyira, M. M. (2015). Patients' satisfaction and associated factors among outpatient department at Wolaita Sodo University Teaching Hospital, Southern Ethiopia: A cross sectional study. *Sci J Clin Med*, 4,109-116.
- Schauffler, H. H., Rodriguez, T., Milstein, A. (1996). Health education and patient satisfaction. *Journal of Family Practice*, 42,62-68.

Srivastav, S., Mahajan, H. (2014). Satisfaction levels among patients availing DOTS services in Bundelkhand Region (UP), India: Evidence from patient exit-interviews. *Annals of Tropical Medicine and Public Health*, 7,116.

Tesfahuneygn, G., Medhin, G., Legesse, M. (2015). Adherence to Anti-tuberculosis treatment and treatment outcomes among tuberculosis patients in Alamata District, northeast Ethiopia. *BMC Research Notes*, 8,503.

Wadhwa, S. S. (2002). Customer satisfaction and health care delivery systems: Commentary with Australian bias. *The Internet Journal of Nuclear Medicine*, 1,1539-4638.

Weingarten, S. R., Stone, E., Green, A., Pelter, M., Nessim, S., Huang, H., Kristopaitis, R. (1995). A study of patient satisfaction and adherence to preventive care practice guidelines. *The American Journal of Medicine*, 6,590-596.

WHO (2014). *Global Tuberculosis Report*. Switzerland: GENEVA.

WHO (2015). *Global Tuberculosis Report*. Switzerland: GENEVA.



