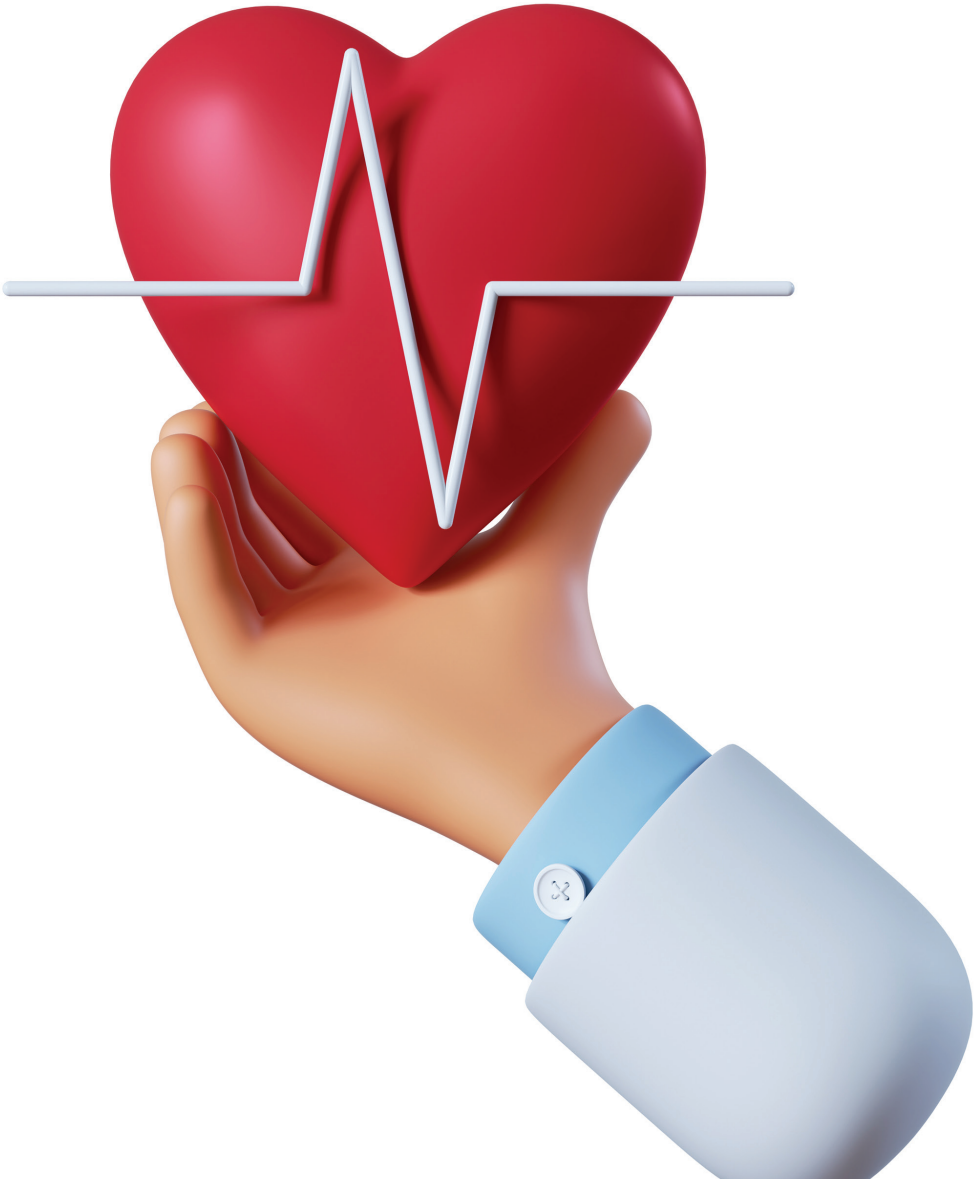
MEDICAL SCIENCES AND MULTIDISCIPLINARY APPROACHES



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PREFACE

Today, the field of medical sciences shows new applications and scientific developments every day. We continue our efforts to convey and reveal the developments and studies in this field to all partners in the field, and we strive to present the researches in the field to the reader. We believe that our book, which consists of 07 chapters, will provide significant benefits to scientists who are experts in this field. We care about the efforts of the contributing authors, thank them for their contributions and hope that it will bring benefits to both the field and humanity.

EDITORIAL BOARD

MALARIA IN PREGNANCY AND COMPLICATIONS

Başak CINGILLIOGLU[1]

Abstract: Malaria is a disease caused by a parasite and spread to people by Anofel type mosquito species. Malaria symptoms are typically high fever, chills, and flu-like symptoms. Plasmodium falciparum, P. vivax, P. ovale, and P. malaria are the four types of parasites that infect human. Of these species, P. falciparum is the parasite most likely to cause serious infections and can lead to death if not treated. Although malaria can be considered a deadly disease, death is usually preventable. Plasmodium falciparum is the most common serious and life-threatening type of malaria, and this parasite is very common in African countries south of the Sahara Desert. People who are heavily exposed to the bites of mosquitoes infected with P. falciparum are at risk of dying from malaria. Young children and pregnant women or tourists who are not immune to malaria are more likely to get sick and die. Humans get malaria as a result of being bitten by the female Anopheles mosquito. Only Anopheles mosquitoes can transmit malaria, and these mosquitoes must have been infected by receiving blood from a previously infected person. When a mosquito bites an infected person, it also takes a small amount of blood containing the parasite. After 1 week, when the mosquito bites another person, the parasites mix with the mosquito saliva and inject it into the blood of the bitten person. The malaria parasite can also be transmitted through blood transfusions, organ transplants, or the use of infected syringes. Malaria can also be transmitted from mother to fetus before or during birth, and congenital malaria may occur in the born baby. Symptoms of malaria include fever and flu-like illness, such as chills, headaches, muscle aches and fatigue. Nausea, vomiting and diarrhea may also

1 Istanbul Prof. Dr. Cemil Taşçioğlu City Hospital Istanbul/ Türkiye, e-mail:bskcin@gmail.com, Orcid No: 0000-0002-1666-858

occur. As the parasite infects red blood cells, loss of red blood cells occurs and anemia and jaundice are observed. Immediate treatment is required, if left untreated, malaria can cause kidney failure, seizures, confusion, coma, and death. Malaria may be more severe in pregnant women than in non-pregnant women. Malaria can cause antenatal problems such as preterm birth, miscarriage and stillbirth. Severe malaria disease can cause pulmonary oedema, severe anemia, shock and maternal death.

Keywords: Plasmodium Parasite, Malaria, Antimalarial Drugs, Low Birth Weight Neonatal, Maternal Mortality, Neonatal Mortality

INTRODUCTION

Malaria infection during pregnancy poses significant risks to the mother, fetus and newborn. Protozoan parasites are introduced into the bloodstream by the bite of the sporozoite-bearing female anopheles mosquito**.** Sporozoites invade hepatocytes and proliferated themselves in liver. After proliferation in the liver, parasites invade the erythrocytes and consume haemoglobin and change the erythrocyte membrane. This causes aggregation of infected erythrocytes and make clusters and stick to inside of the small blood vessels of brain, kidneys and other affected organs (Al Khaja and Sequeira, 2021).These parasites that consist of placenta and cytoadherence causes complications in pregnancy (Duffy and Fried, 2005). Infected red blood cells sequestrate in the intervillous space, parasites bind to surface chondroitin sulfate-A (CSA), as a result of these events placental basement membrane thickens and maternal fetal exchange mechanism becomes dysregulated (Sharma and Shukla, 2017).

Women can develop immunity as producing antibodies against parasite-binding sites to CSA (Conroy et al., 2012). The symptoms and sequelae of malaria in pregnancy alter with the severity of malaria transmission and the level of immunity obtained by individuals.[2]

Women who live in areas of low transmission of Plasmodium falciparum may experience severe malaria attacks due to low level of immunity, also for this reason the pregnancy can result in stillbirths or

2 WHO. Guidelines for the treatment of malaria. Third edition, 2015.Geneva, World Health Organization, 2015.https://apps.who.int/iris/handle/10665/162441 (Access Date: 27.12.2022)

spontaneous abortion or maternal death. (Luxemburger et al., 1997). As opposite to this, women who live in areas of high transmission of P. falciparum, levels of acquired immunity tend to be high, the symptoms may not be obvious so that leads to maternal anaemia and low birth weight (Steketee et al., 1996). In the literature despite there is less data on P. vivax, there is evidence that it may also cause anemia and low birth weight (Nosten et al., 1999).

It has been estimated that 5–12% of all low birth weight and 35% of preventable low birth weight delivers are because of malaria during pregnancy (Steketee et al., 1996) and come up with 75 000 to 200 000 infant deaths each year (Steketee et al., 2001).

MALARIA DISEASE

Malaria is caused by single-celled microorganisms of the Plasmodium group. It is spread exclusively through bites of infected Anopheles mosquitoes (Kristin and Chandy, 2022). The mosquito bite introduces the parasites from the mosquito's saliva into a person's blood. The parasitetravel to the liver where they mature and reproduce (Caraballo and King, 2014). Five species of Plasmodium can infect and be spread by humans. Most deaths are caused by P. falciparum, whereas P. vivax, P. ovale, and P. malariae generally cause a milder form of malaria. The species P. knowlesi rarely causes disease in humans.[3]

Plasmodium Parasite Life Circle

Only female mosquitoes, called Anopheles, feed on blood. And these females prefer to feed at night (Arrow and Gelband, 2004)

Plasmodium reproduction phases:

1. Mosquito bite: Infected Anofel mosquito bites the human and "sporozoites" introduced into bloodstream.
2. Proliferation in liver: Via bloodstream sporozoites invade hepatocytes and proliferated up to 40,000 parasites in each hepatocyte.

3 World Health Organization. (2021). World malaria report 2021. World Health Organization) , https://apps.who.int/iris/handle/10665/350147 (Access Date:27.12.2022).

3. Hepatocyte break down: after the break down of hepatocyte Plasmodium cells into bloodstream and invade red blood cells. This form of the Plasmodıum called merozoites. In red blood cells ıt is replicating themselves over 24–72 hours to form 16–32 new merozoites. (Cowman et al., 2016)
4. Invasion and proliferation in new red blood cells.
5. Gametocytes phase: A small number of parasites turned into early sexual stage parasites called male gametocytes and female gametocytes.These gametocytes develop by settling in the bone marrow and return to the blood circulation.
6. Second mosquite bite:After a mosquito bites an infected human gametocyte uptaken and undergo sexual reproduction, and form new sporozoites. So the cycle goes on.(Cowman et al., 2016)

Uncommonly through blood transfusion, plasmodium parasites can also be transmitted and malaria disease can occur (Owusu-Ofori et al., 2010)

SYMPTOMS

The tendency of P. falciparum to attach to blood vessel walls determines the severity of malaria and the symptoms. Parasites damage the affected vessels and surrounding tissue, so if they are trapped in the blood vessels of the lung that provoke to respiratory failure. If they are trapped in the blood vessels of the brain that provoke coma; in placenta they may contribute to low birth weight, premature birth or stillbirth (Ashley et al., 2018). Anemia is often seen during disease owing to the destruction of red blood cells. 10–15 days after the mosquito bite symptoms usually begin, but insome P. vivax strains infections symptoms could be late as like several months.

These symptoms could be seen: (Mild disease)

- Paroxysm—cyclic coldness followed by shivering and then fever and sweating,
- Headache,
- Fatique

- Abdominal Discomfort,
- Muscle pain (Despommier et al., 2019)

Severe and Complicated Malaria

The cause of severe malaria is usually P. falciparum. These symptoms could be seen in severe malaria disease:[4]

- Fatigue,
- Loss of Consciousness,
- Respiratory Distress,
- Pulmonary Oedema,
- Jaundice,
- Convulsions,
- Coma,
- Haemoglobinuria,

PREVENTION of MALARIA DISEASE

WHO published a guideline in Geneva in 3 June 2022, for malaria disease prevention (WHO Guidelines for malaria, 2022)

Insecticide-Treated Nets

WHO recommends the use of insecticide-treated nets (ITNs) for prevention and control in areas where malaria transmission continues. ITNs are the most effective method wherefore people rest at night and the mosquitos feed at night. ITNs can be used both indoors and outdoors, provided they are kept away from sunlight (as sunlight impairs the insecticidal effect).

Indoor Residual Spraying

WHO offers indoor residual spraying (IRS) in these circumstances:

4 WHO. Guidelines for the treatment of malaria. Third edition, 2015. Geneva, World Health Organization, 2015 https://apps.who.int/iris/handle/10665/162441, (Access Date: 27.12.2022)

- Structures must be suitable for spraying. Some shelters may be open-sided structures or residues of insecticides may remain in the materials that used in the construction. In such cases IRS is not recommended
- The IRS must be available and reachable in the setting.
- There must be sufficient resources to cover the relatively high costs.

Malaria Vaccine

Malaria vaccine is in research phase.

- WHO recommends the RTS, S/AS01 malaria vaccine to prevent P. falciparum malaria in a four-dose schedule from 5 months of age to children living in areas with moderate to high transmission.
- RTS,S/AS01 vaccine in a five-dose strategy may be recommended if seasonal malaria is high in the country or there is a perennial malaria trans mission

Recommendations For Protection from Malaria in Pregnancy: (WHO Guidelines for Malaria, 2022)

Insecticide-treated nets

- Intermittent preventive treatment of malaria in pregnancy (IPTp)

All women in their first or second pregnancy provide intermittent preventive treatment with Sulfadoxine-pyrimethamine (SP) in malaria-endemic areas in Africa as part of antenatal care (Strong recommendation).

IPTp doses mustbe given at least 1 month apart and should start in the second trimester. At least three doses should be given.

DIAGNOSIS of MALARIA

- **Microscopic Examination**: The current gold standard of the diagnosis of malaria in pregnancy, as in non-pregnant patients, depends on microscopic examination of thick and thin blood films for parasites

The physician should be aware of these prognostic factors while examining the peripheral blood smear:

1. The mature trophozoites and schizonts of P. falciparum presence and count of them.
2. Searching malaria pigment in more than 5% of the polymorphonuclear leucocytes (Nguyen et al., 1995).

Three negative malaria smears 12–24 hours which is done successively, disqualify the diagnosis of malaria in a febrile patient.

- **Antigen-based rapid diagnostic tests:** Rapid diagnostic tests should not take place the blood films because of their less sensitivity.
- **The polymerase chain reaction**: Due to their cost and complexity detection of the parasite's DNA not widely used in areas where malaria infection is intensive (Nadjm and Behrens, 2012).

MANAGEMENT of MALARIA DISEASE in PREGNANCY

The severity of the disease guides the management and the treatment[5]. Fatality rates are approximately 0.1% for P. falciparum in uncomplicated disease but unfortunately particularly fatality rates are getting higher as could be 50% in pregnancy compared with 15–20% in nonpregnant women (Taylor et al., 2006).The fatality rates are low in nonfalciparum malaria disease but still be observed (Poespoprodjo et al., 2008).

These Obstetric Complications Can Be Seen in an Acute Symptomatic Malaria Disease

- Preterm labour,
- Fetal Growth Restriction,
- Stillbirth and Premature Delivery,

5 Royal College of Obstetricians and Gynecologists, 2010 The Diagnosis and Treatment of Malaria in Pregnancy (Green-top Guideline No. 54b) https://www.rcog.org.uk/guidance/browse-all-guidance/green-top-guidelines/the-diagnosis-and-treatment-of-malaria-in-pregnancy-green-top-guideline-no-54b/ (Access Date: 27.12.2022).

- Maternal Nypoglycaemia,
- Maternal Thrombocytopenia,

Acute malaria can cause thrombocytopenia during pregnancy, so thromboprophylaxis can be planned due to the risk of hemorrhage. While acute malaria can cause thrombocytopenia, it can progress to disseminated intravascular coagulation in severe malaria.50. Acute malaria causes thrombocytopenia and, in severe malaria, can cause disseminated intravascular coagulation. By day 7,90% thrombocytopenia be freed with treatment and 100% by day 14 (Tan et al., 2008).

- Doppler abnormalities in fetal and placental circulation (Dorman et al., 2002)
- Fetal Heart Rate Abnormalities,

Especially in the attack of fever in severe malaria, cardiotocograph monitoring may show fetal tachycardia, bradycardia or late decelerations, indicating fetal distress (Luxemburger et al., 2001). Maternal hypoglycemia that may cause fetal distress should be excluded, quinine treatment could do this.

General Principles

- What is valid in all obstetric practice is also valid in this disease; maternal life comes first.
- The role of early cesarean delivery in severe malaria has not been proven in terms of live birth and infant health.
- If there is indication for usage, tocolytic therapy at and prophylactic steroid therapy could be used (Steer, 2006).

At the third trimester of pregnancy maternal malaria couldcause congenital malaria. Congenital malaria can occur from the first weeks to months of life and can cause newborn deaths and (Steketee et al., 2001). Histopathologic examination of placenta as it is more sensitive than microscopy for detection of placental parasites (Hamer et al., 2007).

- In pregnancy uncomplicated malaria is notan indication for labor.

- A multidisciplinary team approach (intensive care specialist, infectious diseases specialist, obstetrician, neonatologist) is necessary for optimal management of mother and baby in severe and complicated malaria disease.
- Regular antenatal care is advised following recovery from an attack of malaria during pregnancy.

Countries may have their own malaria protocols. In this article it will be mentioned about WHO malaria guideline and Royal College of Obstetricians and Gynecologists' malaria treatment protocols (Table 1 and Table 2).

How are Pregnancy-Related Complications of Severe Malaria Managed?

In pregnancy severe malaria is an emergency situation and women should be treated in a multidisciplinary hospital and if needed in an intensive care unit,

Maternal hypoglycemia; monitor regularly, correct it. Keep in mind that can be exacerbated by quinine.

Hypoglycemia may cause fetal bradycardia and fetal distress (Boland et al., 1985).

***Pulmonary oedema and acute respiratory distress syndrome*;** jugular venous or central venous pressure should be measured and stabilize right arterial pressure less than 10 cm H2O.

With a high mortality of over 50%, pulmonary oedema is a serious complication of severe malaria. (Adam et al., 2004) Itmay already exist in the patient clinic or may develop suddenly or develop after delivery with an increase in respiratory rate 39, 40, 86, 90–93. If this syndrome develops, fluid restriction be needed. Give oxygen, diuretic, intubate and add positive end-expiratory pressure/continuous positive airway pressure in life-threatening hypoxaemia

- ***Severe anemia*** Transfusion with packed erithrocyte

Severe anemia is associated with postpartum haemorrhage and perinatal mortality and maternal mortality (Maitra et al., 1993). Monitor haemoglobin and transfuse if necessary.

- ***Secondary bacterialinfection*** should be kept in mind if the patient becomes hypotensive.

Blood cultures should be taken, after the results of blood culture and sensitivity testing are available, give the convenient antibiotic. If the blood culture is not available, septicemia cause is most likely Gram-negative septicaemia, broad-spectrum antibiotics (such as ceftriaxone) could be started immediately (Munnur et al., 2005).

- ***Coma (cerebral malaria)*** Monitor using Glasgow Coma Score. Maintain airway, place patient on her left side, treat the causes of coma,
- ***Hyperpyrexia*** tepid sponging, fanning and antipyretic drugs
- ***Convulsions*** Maintain airway; give intravenous or rectal diazepam,
- ***Renal failure*** Treat pre-renal causes, check fluid balance and urinary sodium; if renal failure occurs, send haemofiltration or haemodialysis orperitoneal dialysis.
- ***Spontaneous bleeding*** Transfusion with fresh whole blood, give Vitamin K by injection,
- ***Metabolic acidosis*** Prevent by balanced fluid balance; measure JVP/CVP by central venous access helps optimise fluid balance. If severe, send haemofiltration or haemodialysis,
- ***Shock*** Suspect septicaemia, take blood for cultures; give parenteral broad-spectrum antimicrobials, correct haemodynamic disturbances,

MALARIA TREATMENT in PREGNANCY

Antimalarial Drugs

Artemisinin derivatives: for the treatment of uncomplicated falciparum malaria, the current standard six-dose artemether + lumefantrine regimen has been evaluated in the second and third trimesters, found to be well tolerated and safe.In Africa many women in the second and third trimesters of pregnancy are using artemether + lumefantrine, or amodiaquine alone or combined with SP or artesunate. If artesunate +

SP is used for treatment, prefer a lower dose of folate (0.4–0.5 mg bw/day) than daily high doses (5 mg) of folate supplementation for concomitant use as this decreases the efficacy of SP.

Dihydroartemisinin + Piperaquine: On the Myanmar–Thailand border, this combination was used successfully in the second and third trimesters of pregnancy.

Mefloquine: only in combination with an artemisinin derivative.

Quinine:allied with risk for hypoglycemia in late term pregnancy**.**

Primaquine and Tetracyclines: should not be used in pregnancy.

Lactating Women

The transition to breast milk of breast milk very little and relatively safe in lactatingwomen. Tetracycline is contraindicated in breastfeeding mothers also primaquine should not be used for lactating women, unless the breastfed infant has been checked for G6PD deficiency.[6]

Table 1: Uncomplicated Malaria Treatment (Created from Guidelines for the Treatment of Malaria, Second Edition, WHO 2010)

Uncomplicating Malaria	
First trimester	Quinine + clindamycin can be given for7 days artesunate + clindamycin for 7 daysis indicated if quinine + clindamycin treatment fails. If clindamycin is not reachable thenquinine monotherapy should be given.
Second and third trimester	Artemisin based combination therapy (ACT) for 7 days or artesunate + clindamycin for 7 days or quinine + clindamycin for 7 day If clindamycin is unreachable then the monotherapy should be given.

6 World Health Organization. (2021). World malaria report 2021. World Health Organization), https://apps.who.int/iris/handle/10665/350147 (Access Date:27.12.2022).

ACT: artesunate plus amodiaquine or artemether plus lumefantrine or dihydroartemisinin plus piperaquine,

Table 2: Complicated Malaria Treatment (Created from Guidelines for the Treatment of Malaria, Second Edition, WHO 2010)

Complicating Malaria

First trimester	Both artesunate and quinine can be considered as options.
Second and third trimester	Parenteral artesunate is the first option in the second and third trimesters, because quinine is associated with recurrent hypoglycaemia

Dosages

Artemether Plus Lumefantrine (ALu): Fixed-dose formulation with standard tablets containing 20 mg of artemether and 120 mg of lumefantrine. The recommended treatment is a 6-dose regimen over a 3-day period. The dosage is determined by the number of tablets per dose based on predefined patient weights. (5-14 kg: 1 tablet; 15-24 kg: 2 tablets; 25-34 kg: 3 tablets; and > 34 kg: 4 tablets), given twice a day for 3 days.

This generelates to 1.7/12 mg/kg body weight of artemether and lumefantrine, respectively, per dose, with a therapeutic dose range of 1.4–4 mg/kg of artemether and 10–16 mg/kg of lumefantrine as given twice a day for 3 days,

Artemsisinins: 2.4 mg/kg body weight,

After studies with oral artesunate, a higher maintenance dose of parenteral artesunate is recommended based on extrapolation,

Quinine: Dihydrochloride is widely used for parenteral use. Intramuscular quinine infusion:

- Firstly; a loading dose of quinine; 20 mg salt/kg body weight – twice the maintenance dose.
- The maintenance dose of quinine (10 mg salt/kg body weight) is administered at 8-hour intervals, starting 8 hour after the first dose.

Following initial parenteral therapy,when the patient is able to tolerate oral therapy, it is important to continue and complete therapy with an effective oral antimalarial using a fully effective ACT (artesunate plus amodiaquine or artemether plus lumefantrine or dihydroartemisinin plus piperaquine) or artesunate (plus clindamycin or doxycycline) or quinine (plus clindamycin or doxycycline).[7]

UK Treatment Guidelines in Pregnancy.[8]

Uncomplicated Malaria with P. Falciparum

- Oral quinine 600 mg 8 hourly and oral clindamycin 450 mg 8 hourly for 7 days**or**
- Artemether and lumefantrine 4 tablets/dose for weight > 35 kg, twice daily for 3 days(with fat) **or**
- atovaquone-proguanil 4 standard tablets daily for 3 days.

Severe or Complicated Malaria with any Species

- Artesunate IV 2.4 mg/kg at 0, 12 and 24 hours, then daily thereafter,
- When the patient is well enough to take oral medication she can be switched to oral artesunate 2 mg/kg (or IM artesunate 2.4 mg/kg) once daily, plus clindamycin.
- If oral artesunate is not available, use a3-day course of Artemether and lumefantrine or atovaquone-proguanil or a 7-day course of quinine and clindamycin at 450 mg 3 times a day 7 days.

Alternatively

- Quinine IV 20 mg/kg loading dose (no loading dose if patient alreadytaking quinine or mefloquine) in 5% dextrose over 4 hours and then10 mg/kg IV over 4 hours every 8 hours plus clindamycin IV 450 mg every 8 hours (max. dose quinine 1.4 g).
- When the patient is well enough to take oral medication she can be switched to oral quinine600 mg 3 times a day to complete 5–7

7 WHO. Guidelines for the treatment of malaria. Third edition, 2015.Geneva, World Health Organization, 2015.https://apps.who.int/iris/handle/10665/162441 (Access Date:27.12.2022)

8 World Health Organization. Regional Office for the Eastern Mediterranean. (□2014)□. Malaria: fact sheet. World Health Organization. Regional Office for the Eastern Mediterranean, https://apps.who.int/iris/handle/10665/204183, (Access Date:27.12.2022)

days and oral clindamycin450 mg 3 times a day 7 days (an alternative rapid quinine-loadingregimen is 7 mg/kg quinine dihyrochloride IV over 30 minutes using aninfusion pump followed by 10 mg/kg over 4 hours).

Non-falciparum Malaria P. Vivax, P. Ovale, P. Malariae

- Oral chloroquine (base) 600 mg followed by 300 mg 68 hours later. Then 300 mg on day 2 and again on day 3.

Resistant P. Vivax

- As for uncomplicated malaria P. falciparum

Preventing Relapse DURING Pregnancy

- Chloroquine oral 300 mg weekly until delivery

Preventing Relapse AFTER Delivery

- Postpone until 3 months after delivery and G6PD testing,
- P. ovale Oral primaquine 15 mg single daily dose for 14 days,
- P. vivax Oral primaquine 30 mg single daily dose for 14 days,

In P. falciparum malaria treatment trials women suffer from anaemia (haemoglobin less than 10 g/dl), If there is anemia in mild and moderate malaria give ferrous sulphate and folic acid at the usual doses.

Malaria recurrence treatment: The World Health Organization recommended regimen of 7 days of artesunate (2 mg/kg/day or 100 mg daily for 7 days) and clindamycin (450 mg three times daily for 7 days) could be given.[9]

Congenital Malaria

During pregnancy or at the time of delivery when malaria parasites cross the placenta vertical transmission of malaria occurs (Brabin, 2007: 95-98). The largest series from USA reported that Plasmodiıum vivax is the predominant species. (Lesko et al., 2007) Even mother gets appropriate treatment during pregnancy newborn can be infected. If the placenta is positive for malaria newborn should be follow up for 28 days.

9 WHO. Guidelines for the treatment of malaria. Third edition, 2015.Geneva, World Health Organization, 2015.https://apps.who.int/iris/handle/10665/162441(Access Date:27.12.2022).

WHO WORLD MALARIA REPORT-2021

Investments in Malaria Programs and Research

The global technical strategy (GTS) provides projections of the funding needed to reach milestones for 2020, 2025 and 2030. Total annual resources needed are estimated to be US$ 4.1 billion in 2016 and will increase to US$ 6.8 billion in 2020. It is estimated that US$0.85 billion per year will be needed for global malaria research and development (R&D) in the 2021-2030 period. For malaria control and elimination in 2020total funding was estimated at US$ 3.3 billion, the highest contribution was from the government of the USA (US$ 1.3 billion) than followed by Germany and the United Kingdom and France and Japan, and rest of them are from the Development Assistance Committee member countries and from private sector contributors.

Distribution and Coverage of Malaria Prevention

Almost 2.3 billion ITNs were supplied globally in 2004–2020, of which 2 billion (86%) were supplied to sub-Saharan Africa. About 229 million ITNs delivered to malaria endemic countries in 2020. Of these, 19.4% were pyrethroid–piperonyl butoxide (PBO) nets and 5.2% were dual active ingredient ITNs. Approximately 91% of these ITNs were delivered to countries in sub-Saharan Africa.

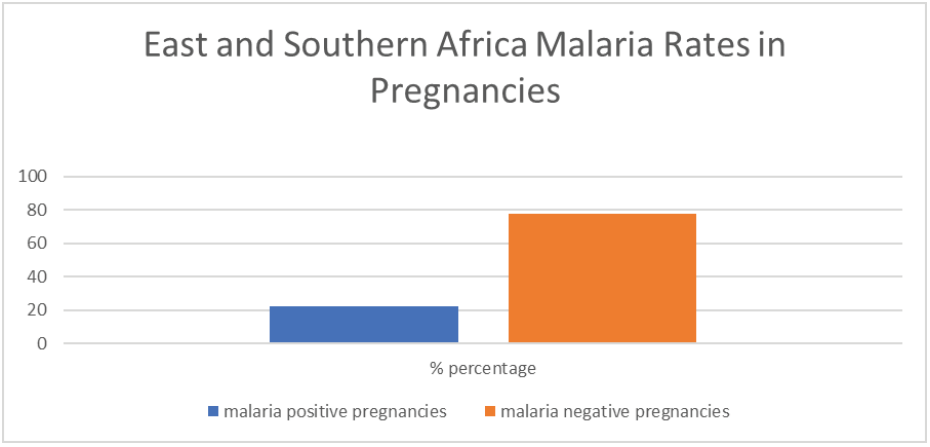
In 2000 about 5% of households had at least one ITN, as a result of progress the period of 2000-2020 this rate increased to 65%. The percentage of households owning at least one ITN for every two people increased from 1% in 2000 to 34% in 2020.

The percentage of the population sleeping under an ITN improved significantly between 2000 and 2020, for the whole population (from 2% to 43%), for children aged under 5 years (from 3% to 49%) and for pregnant women (from 3% to 49%).

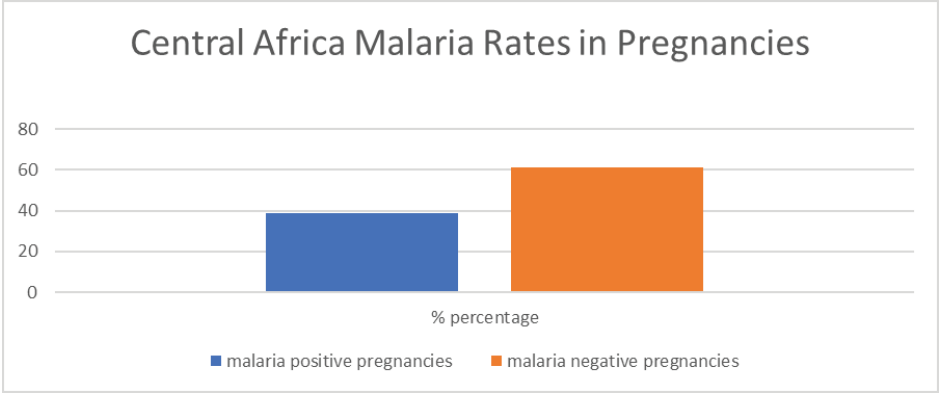
Globallyin door residual spraying (IRS) usage percentage in malaria endemic countries declined from 5.8% in 2010 to 2.6% in 2020. The percentage of the population protected by IRS has remained stable since 2016.

In 2020, the number of children protected with at least one dose of seasonal malaria chemoprevention (SMC) improved and 74% of pregnant women, during their pregnancy used antenatal services at least once. About 57% of pregnant women got one dose of IPTp, 46% gottwo doses and 32% three doses. Below graphics shows engagement of malaria in pregnancy as reported in Who World Malaria Report-2021. (Graphic 1-4)

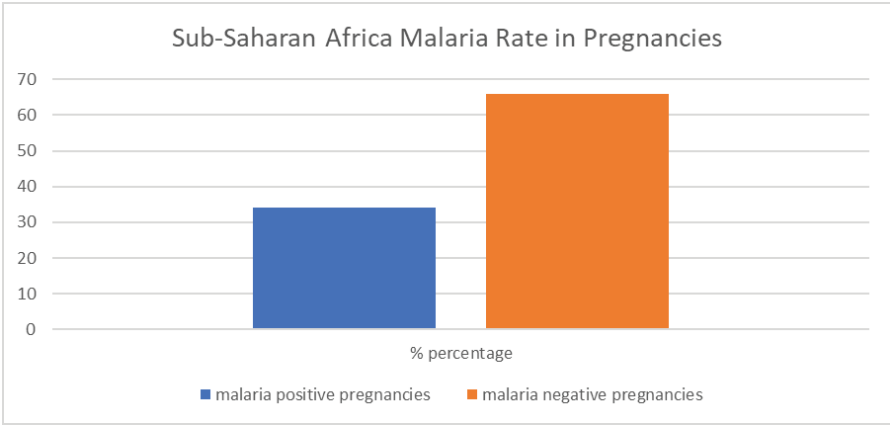
Engagement of Malaria in Pregnancy (Who World Malaria Report-2022)



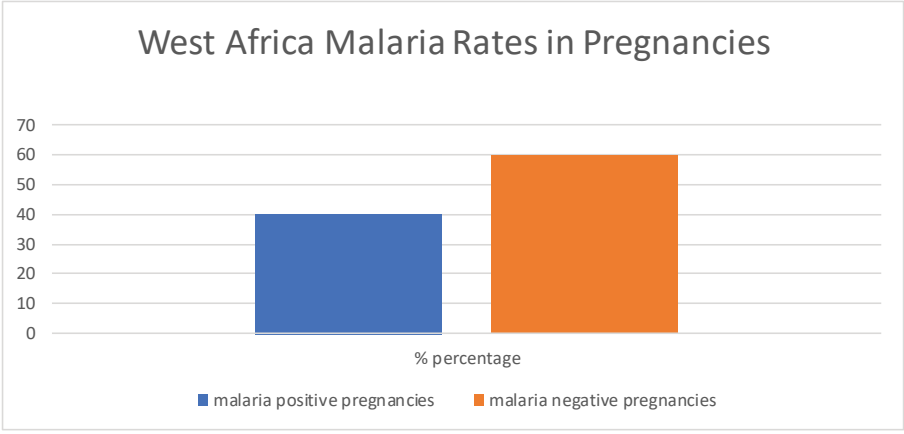
Graphic 1: East and southern Africa malaria rates (Who World Malaria Report-2022)



Graphic 2: Central Africa malaria rates (Who World Malaria Report-2022)



Graphic 3: Sub-Saharan Africa Malaria Rates in Pregnancies (Who World Malaria Report-2022)



Graphic 4: West Africa Malaria Rates in Pregnancies (Who World Malaria Report-2022)

Examining the African continent, western Africa had the highest prevalence of exposure to malaria during pregnancy (39.8%), followed by Central Africa (39.4%), while the prevalence was 22% in eastern and southern Africa.

If we look at the result of malaria infection pregnancies in these countries, 54.1% of neonates born with low birthweight being in the

subregion of west. Approximately 74% of all pregnant women visited ANC clinics at least once during their pregnancy, 57% reached at least one dose of IPTp, 46% reached at least two doses of IPTp and 32% three doses of IPTp. An estimated 408,000 low birth weights in 2020 were prevented by IPTp at all doses.

CONCLUSION

Effective enforcement of the recommendations of malaria strategy in pregnancy requires close cooperation between malaria control and reproductive health programs at all levels, including policy development, planning, logistics, supply and education. During pregnancy, following the pregnant women should be part of the National Malaria Control and Making Pregnancy Safer reproductive health programs. Because low birth weight is a risk factor for neonatal and childhood death, getting ahead of the low birth weights will save many lives.

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THINGS WE SHOULD KNOW ABOUT CHILD NEGLECT AND ABUSE

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Abtract: Raising healthy generations is primarily possible with healthy children, and child maltreatment is a problem that prevents this. It is thought that children are most affected by the socio-economic problems that exist on a world scale, especially in poor countries. In some families, the basic needs of children cannot be met and children may need protection. The phenomenon of children who need to be protected shows itself as one of the most important social problems, a product of the unique socio-economic conditions of each society and especially the economic policies. The profile of the children affected by this problem changes over time in terms of number and quality, and its meaning and intensity in the context of the effects that reveal the problem may differ over time and according to the conjuncture in the country. Many research findings show that exposure to child abuse and neglect affects the child for life and causes medical, psychological and behavioral disorders such as mental problems, depression, post-traumatic stress disorder, substance abuse, suicide attempt and self-mutilation. Within the framework of this scope; The definition of

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child neglect and abuse, its types, causes, effects on children, the results of various studies on protection methods and the effectiveness of what we need to know theoretically about child neglect and abuse were evaluated. Child neglect and child abuse is an important phenomenon that threatens the well-being of all children. Among the factors affecting the neglect and abuse of children, the individual characteristics of the parents, depression-anxiety, low tolerance, weak self-confidence, insecure attachment with their parents, family conflicts and weak social support come to the fore. In this respect, the study emphasizes the importance of working with systems at different levels in order to reduce the risk factors faced by the child in terms of social work intervention and to establish protective mechanisms.

Issues related to child neglect and abuse are shaped depending on the value given to the child in the society, the values and beliefs of the society, the methods of punishment and discipline and the acceptable and unacceptable behaviors towards the child.

The aim of this study is thought to improve the child protection system, create a safer living environment and increase the effectiveness of activities and practices for children at risk.

Keywords: Child, Abuse, Neglect, Precaution, What We Need to Know

INTRODUCTION

In the future of social development and society, the physical and mental health of children, their awareness of their own values and their ability to use these values for the benefit of society are closely related to the conditions that will be provided to them. Raising children as responsible, conscious and qualified individuals is an important criterion for the present and future of society.

Social interaction begins when a baby is taken to the first lap. Just as individuals develop and mature all their skills from the moment they are born, they also develop and mature their skills in bonding, bilateral relations and communication in the process. For this reason, neglect and abuse suffered by the child's parents or people who take care of him during the development process inhibit the development and maturation of these skills.

Convention on the Rights of the Child; A child shall be any human being below the age of eighteen, except in the case of an earlier age of majority under the law applicable to the child. Child abuse and neglect is all of the actions and inactions directed at the child by an adult such as a mother, father or caregiver, which are considered inappropriate or damaging by social rules and professional people, and prevent or restrict the child's development. As a result of these actions or inactions, the child's physical, mental, sexual or social harm and health and safety are endangered (Berkmen and Orkray, 2015: 242).

First of all, in order to prevent neglect and abuse, we need to know what these concepts are, their distinctive features and risk factors. Knowing how we should behave when we meet prevents trauma from being triggered. Neglect and abuse is not a situation that can be overcome by a single person, organization or institution, but is a situation that can be prevented with the effort and awareness of the society.

The child is the creature that requires the longest care, love, attention and care among all living things. For this reason, the progress and development of a society depends on the children who grow up in that society. It can be achieved with a healthy physical, cognitive and social development (Berkmen and Orkray, 2015: 242). Child Abuse affects the physical and mental health of the child directly and deeply and causes serious morbidity and mortality in children. It is a social and medical problem. Child abuse has existed since ancient times. Although it is seen as a problem in the world, it is considered important and efforts are made in this direction. Its execution is only 100 years old. In Türkiye, on this issue the beginning of the studies is very new (Güner, Güner ve Şahan, 2010: 108).

Developed countries defined child neglect and abuse in the second half of the last century and developed preventive programs (Beyaztaş, 2009: 75). Developing countries recognized child neglect and abuse as a public health problem in the last two decades and began to develop preventive programs. "Child Abuse and Neglect in Türkiye Prevention Association" pioneered important scientific studies on the subject. However, until the nineties, no significant clinical studies were found in this area. Published scientific studies are also increasing (Oral and Blum,

2003: 148; Oral and Can, 2001: 279). World Health Organization (WHO) child abuse in 2002; "Exposure to all kinds of attitudes and behaviors, including for commercial advertising purposes or all other forms of influence, that will cause any physical and/or emotional, sexual, neglect or neglect that causes the child's health, growth and development to be adversely affected; It is defined as "bad behaviors resulting in physical/emotional/sexual abuse, neglect and other types of exploitation that negatively affect the health, survival, development or sense of trust in relationships of children under the age of 18" (Özcebe, 2009: 18). According to another definition; Child neglect affects the child's development negatively as a result of not being able to adequately meet the physical, mental and emotional development of the child (Derman, 2014: 26).

Although the extent of child neglect and abuse in the world is not known exactly, in a meta-analysis study examining the prevalence of child neglect and abuse worldwide, it is stated that physical abuse is seen at 22.6%, sexual abuse at 12.7%, and emotional abuse at 36.3% (Stoltenborgh et al., 2015: 37). Made in Türkiye; According to the research on child abuse and domestic violence, physical abuse is 43%, emotional abuse is 51%, and sexual abuse is 3% among children aged 7-18. It is thought that the number of studies on the prevalence of childhood abuse and neglect in our country is low, and this is due to the difficulties in determining and inadequacy in reporting (Bahar, Savaş and Bahar, 2009: 51). In this study, it is aimed to discuss the definition of child sexual abuse and neglect, its types, causes, effects on children, ways of protection, the results of various studies on child neglect and abuse, and the effectiveness of what we need to know theoretically about child sexual neglect and abuse.

History of Child Abuse and Neglect

Talking about the history of child abuse should start with the history of childhood. Because when history is examined it is seen that the concept of child was not on the agenda for a very long time. Raising the child as a competent and useful individual has been on the agenda for centuries. The human life span is very short, such as 25-35 years. The-

refore, it was not possible to consider childhood as a separate period. (Polat, 2007: 14).

Childhood is a process in which important steps are taken for cognitive, physical and social development. It is very important in human development process. Children are active in the future, education and social life so that they can be participatory, competent and educated individuals. To ensure social peace and progress, it is extremely important to provide basic needs in childhood. If we consider the elements together, childhood is defined as a special social category. It is revealed that it should be evaluated (Çakmak, 2013: 52).

The special consideration of children in history is detected in the pioneering work of P. Aries in the early 1960s.

It has been influenced by the explosion of studies on family history, following his work. Historians, culturally, socially and economically tended to establish relations between changes. Children's historical research entries can be divided into two forms as subjects of cultural definitions and recipients of organizational practices. The first type of research, which can be called the "history of emotions," examines the changes in their perceptions, attitudes and feelings towards their children. A second type of research, which can be called "history of institutions", covers the child's life. It has turned to the policies, institutions and organizational practices that regulate it (Tan, 1999: 31). According to Aries, the features that distinguish children from adults in the Middle Ages were not noticed and "Childhood feeling" is missing. This is why in medieval times children were different from an adult.

They had no clothes, no food, no games, no toys. The infancy period lasts until the child is seven years old, from this age the child was directly involved in the adult world. In short, in the Middle Ages Children were viewed as miniature adults.

Despite the understanding that childhood is a separate period, medieval society emphasizes that he does not know this (Archad, 2004: 56). According to; child's family life mothers to enjoy spending time with them as they take on a more important role in and the necessity of prote-

cting the child as a sensitive being in social life and adoption has affected the change in the understanding of childhood.

The increasing interest in education in the 19th and 20th centuries gave a different meaning to the family and it has changed the society's view of the child; children's daily life and began to be accepted as social beings participating in the construction of knowledge. According to the new understanding of childhood defines, children play a more active role in social life. Accordingly, children are actors participating in education and social life, assumes a role influencing and sharing responsibilities (Sorin, 2005: 12; Heywood, 2003: 43).

It is seen that the probability of child abuse to start in history is high. On the basis of this thought children of adults as individuals who also need to be supported during the growing period.

Throughout the history of humanity, in every culture and society, from the beginning of written history, different. Despite the fact that child abuse is found in the sources, the attention of humanity to the issue has been noticed in the last century. Child abuse in the novels of Victor Hugo and Charles Dickens described in detail and in a multidimensional way. The first definition in the medical literature is It was made by Tardieu in 1860. Tardieu, 1860 in Paris Medicine Caffey 1946 "Caffey Syndrome" in children with bone fractures and subdural hematoma in kempe defined the "Battered Child Syndrome" in 1961. Same at the same time, the term "Child Abuse" began to be used. Garbarino and Gilliam 1980. In particular, the detection of violent behavior against children by experts. They stated that it should be done (Fırat, 2007: 62; Kural, 2014: 24; Özer et al., 2014: 111).

What Are The Effects of Neglect on Children?

Children exposed to neglect basically experience a feeling of insecurity. Enough of themselves. Since they do not feel safe, they experience the feeling of loneliness very intensely

A healthy relationship that cannot be established is reflected in his communication with his peers and the environment. They experience failures. This situation sometimes manifests itself as behavioral prob-

lems. Sometimes children tend to create health problems in order to get attention and constantly can cause physical discomfort. This situation continues into adulthood. An individual who has been neglected in childhood

In his adulthood, he may have a problem of confidence both in his environment and in himself. In these individuals; depression, suicidality, self-harm, violent tendencies, predisposition to some addictions observable. All of these cause a deficiency in managing their emotions and in social relations (Sorin, 2005: 12; Özer et al., 2014: 111).

Types of Child Neglect and Abuse

- Physical Abuse,
- Sexual Abuse,
- Emotional Abuse,
- Neglect (Barlık, 2018: 26).

Physical Abuse; child's non-accidental injury. Physical violence against a child by an adult using various methods for punishment, discipline, venting or other purposes.

Sexual Abuse; The use of a child under the age of 18 by an adult for sexual satisfaction is defined as child sexual abuse.

Emotional Abuse; Psychologically and emotionally, it is defined as the exploitation and abuse of the child's feelings.

Neglect; The person responsible for the child does not meet the needs (health, education, emotional development, nutrition, shelter, safe life, etc.) necessary for the development of the child or does not take these needs into consideration (Aslan and Çelik, 2020: 40; Tekin, 2020: 85; Yıldız et al., 2017:303).

Causes of Child Neglect and Abuse

Knowing, recognizing and preventing child abuse is a complex process (Eslek, 2018: 41). Child abuse of different types and sizes; It occurs depending on various facilitating factors such as religion, moral, social, cultural, related to the child himself, socioeconomic status of the family

and the characteristics of the parent, and the interaction of these factors with each other. It is stated that these factors will increase the impact of abuse on development, and are closely related to the duration, severity and degree of closeness with the perpetrator (Tercier, 1998: 1108).

Previously, it was claimed that child abuse was rarely practiced by adults with personality disorders and low socio-economic status, the perpetrators were exposed to abuse in their childhood, and the prevalence of abuse increased over the years. However, studies show that child abuse and neglect are not uncommon as is thought and can occur in societies with various structural characteristics (Tercier, 1998: 1108; Vandeven and Newberger, 1994: 362; Garbarin and Gilliam, 2002: 74).

Consequences of Child Neglect and Abuse

Recognition of children at risk is very important in detecting and diagnosing the consequences of child neglect and abuse. In this context, children who are victims of war and migration, children born out of wedlock, with special needs, living with step-parents, whose parents are addicted to drugs, born after unwanted pregnancy, and children from families with low socioeconomic and educational levels are at risk (Önal et al., 2013: 124; Şener et al., 2014: 1046). Child abuse and neglect negatively affect the individual's physiological and psychological well-being. In addition to its effect, it also affects education and social life (Koçtürk and Yılmaz, 2018: 1920). In the literature, it has been determined that individuals exposed to sexual abuse experience many problems such as early adolescence, post-traumatic stress disorder, depression, maladaptive sexual development, leaving education and self-harm (Turhan et al., 2006: 153).

Ways of Protection from Child Neglect and Abuse

As with any problem, the best way to deal with child abuse and neglect is to prevent the problem from occurring. Efforts to prevent abuse are an extremely important approach that supports treatment, both in terms of preventing abuse of children and adolescents who have not been abused, and preventing abused children from being abused repeatedly (Aktepe, 2009: 95).

A three-stage abuse prevention process is often mentioned in the literature on abuse prevention.

According to This:

a. Primary prevention purpose; to educate children, parents and the community at large about abuse. The main focus of primary prevention for children is child-centred, classroom-centered programs aimed at recognizing, coping with and reporting child abuse.

b. Secondary prevention methods; It aims to reduce the risk factors that increase the potential for abuse in individuals at high risk. For example, these programs are administered to children with substance abuse or high-risk behaviors.

c. The tertiary prevention method is; It includes interventions to be made for the risk of the child being abused again after the abuse has occurred. For example, it is reported in the literature that the rates of repeated sexual abuse of victims of sexual abuse are high (Kogan, 2005: 25). This type of prevention focuses on the treatment of child victims and intervenes in psychosocial factors that cause them to be abused again. It is important that mandated reporters and citizens in the community know what their role is in preventing child abuse. The goal is to prevent abuse before it occurs.

To do this, it is important that families receive the support and help they need (Wurtele, 2009: 1; Livny and Katz, 2016: 86; Wurtele and Kenny, 2010: 130).

Advocate: Help change the way our state and nation thinks about prevention by focusing on community activities and public policies that prioritize prevention right from the start. Contact local, state and national lawmakers about the importance of prevention programs (Kogan, 2005: 25).

Volunteer: Serve on a committee or board. We all play a role in raising children, whether we are neighbors, educators, caregivers or family members.

Educate: Contact local school districts and faith communities about sponsoring classes for parents. Be a mentor to a new parent, share your

skills with your neighbors. A healthy, nurturing environment for children is one of the best lifelong investments we can make.

Support: Get to know and support the children and families in your community. With the support of engaged communities and nurturing families, all of our children can thrive. Know the resources available in your community and how to connect families to them (Livny and Katz, 2016: 86).

Report: Recognize the signs and symptoms of child abuse. If you suspect child abuse and/ or neglect (Schilling and Christian, 2014: 309)

Made Works

In the study of Küçükoğlu and Başar (2020: 11); Theses on child neglect and abuse in Türkiye between 2015-2019 were analyzed. The data search engine of the national thesis center was "child abuse, child neglect, physical abuse, physical neglect, sexual abuse, sexual neglect, emotional abuse, emotional neglect, child abuse, child neglect, physical abuse, physical neglect, sexual abuse, sexual neglect, emotional neglect". A search was conducted using the keywords "abuse, emotional neglect, Türkiye" separately, and as of August 2019, 81 theses were reached. Among these theses, those that did not meet the study criteria, duplicated theses, and did not have a full text were excluded and the remaining 63 theses were included in the study.

- It was determined that the most theses were done in 2018 (n=23, 36.5%), followed by 2015 and 2017 (n=11, 17.5%), and the least number of studies were done between 2016 and 2019 (n=9, 14.3%). When the types of neglect and abuse examined in the theses included in the study were investigated; The majority of theses (n= 38, 60.3%) examined all types of neglect and abuse together, followed by sexual (18, 28.6%), emotional (n=6, 9.5%) and physical abuse (n=1, 1.6%). determined.

Social Policies Against Child Abuse in the World

"Treatment of Children" published by the World Health Organization in 2017 In the report titled, one out of every four children worldwide is exposed to physical violence was recorded. The report found that 23

percent of children worldwide suffer from shaking, beating, eating. He stated that he was subjected to physical violence, including beating. In the report, the percentage of children 36 victims of emotional violence such as threats, scolding, humiliation and pressure was recorded.

In the report titled "Treatment of Children" published by WHO in 2017; 26% of maltreated children worldwide are sexually abused 18 percent of the victims of sexual abuse are girls and 8 percent are boys formed children (Tat, 2016: 309). According to the report; girls' sexual. The rates of abuse are higher for boys than for boys.

Children's rights are the cornerstone of universal human rights culture and the human rights of future generations forms the basis of the assurance of their rights. One of the core values of the European Union policies for children within the framework of the "principle of respect for human rights" has an important place in of the European Union's legislation on children. The foundation was prepared by the United Nations in 1989 and came into force in 1990 the "Children's Rights Convention" (Oğuşgil, 2009: 80). based on human rights respect for children and their rights, together with the regulations on children's rights, which are shows. By producing social policies together with children's rights, achieved good living conditions. In Jugendamt, Germany, to preserve family integrity and make the most of children. It is a social institution created to contribute to the development of purpose of children and supporting parents in the upbringing, care and education of young people to provide positive living conditions. Children and young people with problems or difficulties. It is a reference center for however, the German Youth agencies; child from care organizations to educational consultancy, services for young people in a broad framework ranging from supporting children to protecting the well-being of children carries out its studies (Vatandaş, 2014: 137). Economic exploitation of children.

Regulations in the field of law are at the forefront of regulations regarding social policies is coming. The employment of children is regulated by law in terms of age and other conditions. Children under the age of 15 are prohibited from working. 15-18 years on the other hand, the employment of children between taken. In England and Wales, after the "Children Act" came into effect in 1991. Beatings have ended in child

care institutions. Beating of children in Germany by giving priority to measures prohibiting the punishment of child abuse, the law is being combated with state interference. In this country, the first child protection center. It was opened in Berlin in 1976, then it was followed by the center opened in Munich in 1978 followed. Today, there are many child protection centers in Germany. Europe Council of Ministers Commission, in 1985, the member states completely punished the beating. Countries that completely ban the punishment of children with beatings include: Spain, Uruguay, Netherlands, Romania, Croatia, Southern Cyprus, Chile, Portugal, Greece, Ukraine, Israel, Venezuela, Latvia, New Zealand, Hungary, Iceland and Bulgaria (Şirin and Yenibaş, 2007: 23). Prevention of child abuse and child protection centers were opened in order to ensure that they grow up in a safe environment. This punishing children with physical abuse based on children's rights in centers prohibited.

Policies to increase social welfare in Germany have been implemented by many institutions is being carried out. At the national level, the German Buntestag and Bundesrat assemblies determine the rules and instruments related to employment and social security. Moreover, determination and implementation of family, health and income policies are also in their jurisdiction.

In the jurisdiction of local governments; federal government and state to ensure fair income distribution with some of the duties imposed by the parliaments. social benefits, local health institutions and child care organizations (Kurşun and Rakıcı, 2016: 145). German assemblies provide childcare. It provides support in the field of social work by working in the support of places.

The work to be arranged on the basis of social welfare practices in European countries its responsibility; for example, the number of nurseries in the country is less than in other European countries existence, the continuation of financial responsibilities of families on their children and the fact that children. Examples such as living with the family mostly after they became gives important clues about its centered structure (Kurşun and Rakıcı, 2016: 145). In this case with the provision of care

of children with families, families are provided financially by the state requires a lot of help, such as help.

The social welfare level of Norway, which is one of the Scandinavian countries, is quite high. The fertility rate is higher than the Western European average. Analysts this attribute it to the generous family policies of the country. Among the important components of this long-term paid leave and government subsidies for childcare (Kurşun and Rakıcı, 2016: 148). As a country policy of child care, financial and the risk of abuse and neglect of children is reduced by supporting them in other issues. Because factors such as poverty and unemployment cause child abuse and neglect can happen.

With the Guardianship Board Act of 1896, the protection of children was given to the state in Norway. According to this law, families are warned about children neglected by the family and ın case of danger, the children will be taken from their families and taken to the foster family. was given. With the Child Welfare Act 1983, including children in need of care. In particular, protection measures have been increased (Albayrak and Birinci, 2017: 76).

Barnevern System in Norway (former name of Child Protection Agency in Türkiye, current name of institution) assistance provided by the General Directorate of Child Services; end of 2014. To date, 53088 children and youth (0-22 years old) have benefited from the Barnevern service. This help can be in the form of help at home, but mostly voluntarily. By the end of 2014, child welfare service assistance 61% of the children who had received medical assistance received help at home (Albayrak and Birinci, 2017: 79). Supporting families with financial and social security at home, taking care of their children and mainstay of government policy.

Sweden has a National Health and Welfare Board under the Ministry of Health and Social Affairs. Private Family Counseling Center, Family Child Social Service, also affiliated to municipalities. There are Disabled Persons Center, Child and Youth Rehabilitation Centers (Albayrak and First, 2017: 83). Struggling with street children or substance abuse for

every child support for children and their families by these institutions in child abuse and neglect is given.

Social Policies on Child Abuse in Türkiye

As in the whole world, the protection of the family is the basis of social policies in Türkiye. and strengthening it. The family institution, which is the most basic building block of society, that all individuals, women, men, children, young, elderly and disabled, are educated and healthy, strengthening in working life, a healthy ground in social life (Altuntaş, 2016: 23).

As an alternative to taking children away from families, efforts are being made to support it. However, campaigns for this purpose does not appear to be very effective. The most important reason for this is the need for aid. It is insufficient to meet and it is temporary. The other alternative is the Foster Family. Is the dissemination of the system (Altuntaş, 2016: 23). Financially for a certain period of time in terms of support and raising their children in this way, the amount of money given. The fact that families are not at a level to meet their needs is also completely inadequate in terms of children's development.

The extended family, where at least two generations of family members live together, is almost a union with relatives and relatives. It is an example of solidarity. Children grow up with compassion and care in the crowd. While working for their family outside, a family member who walks smoothly between women in the family. There is a division of labor. The most important problem for this family model is divorce; abuse, incest. As the problems are extremely disturbing, not only for the extended family but also for the nuclear family is ignored. However, the conservative approach that gives importance to the family institution to face such problems with courage, to take ownership of the problems and to find solutions call is expected.

As a matter of fact, especially in the last ten years, the approach that glorifies the family has increasingly taking into account the distance between "what should be" and "what is" (Karaman ve Özçalık, 2007; 33). As a result of the children growing up in the structure of the house

sleeping with their siblings in the rooms of the house. The process, which started with the curiosity of each other's bodies for game purposes, later on can lead to sexual abuse. While crowded house is an important factor in domestic abuse, children with a nuclear family structure are also at risk of incest (Koray, 2012; 22).

Child Protection Social Policies in Türkiye

The 1990s were one of the most important turning points in terms of child protection policy. In this period children driven into crime as common social problems, children living on the street, new problem areas such as children drawn into prostitution and children working on the street have emerged. started to emerge. Nursery and Nursing Homes, which were child care institutions until this date, Orphanages were not suitable for the care, education and rehabilitation of the new act. New child-type mobility, developed pervasive behavioral disorders and had long-term institutional showed unacceptable features. Therefore, the care and rehabilitation of these children. For the first time in the history of the republic, temporary care institutions "Children and Youth Centers" and "Conservation, Care and Rehabilitation Centers" began to be established. Child despite these institutional varieties for protection, it is effective in terms of quality and capacity. In particular, the monitoring of these children in the community and family and serious inadequacies continue in the regulations regarding protection and protection (Altuntaş, 2016: 23).

In 2014, for the prevention of child labor, "Child Labour" Effective implementation of the Time-Bound Policy Program Framework for Prevention, Contribute to the elimination of child labour, primarily its worst forms "Enabling Local Resources in the Prevention of Child Labor" in order to ensure. Project" was carried out. Within the scope of the project, five pilot provinces (Adana, Şanlıurfa, Gaziantep, Kocaeli and Ordu) Ministry of Labor and Social Security Labor and Employment Agency Province Child labor monitoring units have been established within its directorates. These units cooperation with other institutions and organizations in the province by establishing an effective monitoring system through (Kurt, 2016: 107).

Efforts to prevent child labor by ensuring coordination and is being carried out. Within the scope of the project, 2204 working and working children were reached. Guidance services were provided to 793 children and families by interviewing 795 families. In addition, 12 June "World Day Against Child Labour" events in pilot provinces was organized (Öntaş, 2008; 28). Social Economic the issue of protecting the family and the child with the Support Service applications, It is a priority social work practice that should be focused on sensitively. This service with this model, children are not institutionalized due to reasons arising from purely economic inadequacy. Especially by supporting families protection of family integrity and the child as a healthy individual in the family environment. It is the general policy of the Ministry, and this understanding also forms the basis of the child policy (Gürer et.al., 2011: 25).

The Association for the Prevention of Child Abuse and Neglect was first established in Ankara in 1988 in our country. This association aims to raise awareness of the society and the people concerned organizes meetings at the international level, publishes various publications and researches (Polat, 2007: 17). Fighting child abuse and neglect apart from this association, which was first established in the field of there is an establishment.

What We Need to Know About Child Neglect and Abuse

- In order to protect children from all kinds of abuse, to minimize the harmful effects of abuse and to rehabilitate them, it is necessary to initiate programs that will create broad social awareness (Kocaer, 2006: 56).
- It is important that forensic and medical procedures be carried out at a single time, in a center consisting of people trained in this field, in order to intervene consciously and effectively with children who have been abused, and to minimize the secondary traumatization of children who have been sexually abused (Acehan et al., 2013: 591).
- The establishment of Child Monitoring Centers (ÇİM) within the hospitals/institutions affiliated to the Ministry of Health was de-

emed necessary to coordinate the functioning of these centers by the Ministry of Health and ÇİM was implemented (Acehan et al., 2013: 591).

- Child abuse and neglect is a complex event with its etiology, diagnosis and treatment and all its dimensions. For this reason, a multidisciplinary team should take part in the protection of children from neglect and abuse, early diagnosis, treatment and rehabilitation, and the nurse is a member of this team (Altınsu, 2004: 62).
- Nurses take an active role in early diagnosis by being aware of the risk factors for child and family regarding child neglect and abuse (Bahçecik, 1993: 193).

In the literature, it has been stated in the literature that nurses' home visits to women before and after birth for two years within the scope of family group follow-up reduce the incidence of child neglect and abuse by 48% (Kılıç and Özçetin, 2018: 107).

Nurses should fulfill their responsibilities in the diagnosis and treatment of child neglect and abuse in both preventive and curative institutions (Koçtürk and Yılmaz, 2018: 1920).

Teach them to ensure their safety.

Teach them to protect their bodies.

Teach them to say no.

Teach them to ask for help.

Place in them the belief that they can share any problem with you.

Teach them not to keep secrets at all times.

Teach to refuse to be touched and set boundaries

Teach that adults will not obey some rules.

The most important feature you need to have in order to apply all these substances is healthy. A healthy relationship with your child can be built through myriad forms of interaction.

This may take a lot of energy and work, but the reward you will receive is well worth it. Mother The first thing to be ensured about being

a father is, of course, that every child's need to be loved, It is enough to be met and to know that there is no one right way. Different upbringing techniques are performed in different ways. Don't expect to be perfect! being a parent, It is also a very difficult job. Remember that the only way to show your love to your child is to say "I love you" to him. Making eye contact, evaluating your head times together, listening to him, confirming your feelings, keeping your promises, sharing boundaries and rules. You say "I love you" in other ways as well, such as your determination, giving freedom to them (Cyr, Michel and Dumains, 2013: 141).

Role of School and Teachers in Preventing Child Abuse

Children, who constitute the group of individuals who have special value and need to be protected all over the world, since they have not gained the ability to resist negative external influences as well as spiritual development, they are prone to all kinds of abuse (Kök, 2006: 3). The first area of defense against child abuse is awareness. Every individual who takes care of children should protect children from harm. He is obliged to know the basics of protecting himself. The protection of children is not only individual, but also it is a social problem. Since educators are an integral part of society, maltreatment against children. They can lead and be involved in the community's efforts to combat abuse, abuse (Tower, 1992: 56).

The place where a child spends the most time outside of his/her family is the school, and the people are the teachers. Teachers communicate more with children compared to other fields, therefore, determining domestic violence and they play a very important role in intervening (Lloyd, 2018: 301; Sanderson, 2004: 50). Teachers and school staff can help prevent child abuse in children's lives. They are in a position to make a significant difference (Doğan and Bayar, 2018: 571; Sterne and Poole, 2009: 122). Students should have close relationships with their teachers, be in direct communication with children to be able to tell children's problems to them, to have knowledge and experience about child education, ability to compare children's behavior with previous behavior or peer norms, being able to notice niche changes, having an obligation to notify; school environment and teachers ıt shows how important

their role is in recognizing and preventing the problem. Moreover, ıt is very important for teachers to have the opportunity to train children and their families on the prevention of abuse. It is an important opportunity to protect children (Karaman- Kepenekçi and Nayir, 2012: 437).

Noticing wounds such as abrasions or bruises on the face or body of a student or changes in the child's behavior such as introversion, unhappiness, distraction, and aggression. An experienced teacher who observes and is knowledgeable about child abuse will share the problems with the student. It is able to produce solutions by providing the appropriate environment and conditions for it to work (Beyazova and Şahin, 2007: 16).

In order to provide a safe social environment, school personnel should not tolerate child abuse and neglect, discipline methods should be written, school programs and policies should be evaluated at regular intervals and positive school should be created. Attitudes and behaviors of school management about child abuse, bad in carrying out anti-treatment activities, making judicial reporting of child victims and ıt is possible to make the process easier or more difficult in intervening with the victim. A school administration that does not understand the mini is that their duty is only to meet the educational needs of the child. Thinking, fearing the deterioration of relations with the family, not believing the child, taking the event lightly may prevent the process by wanting to protect the school or teacher or not wanting to get involved (Grayson, 2006: 1; Shakeshaft and Cohan, 1995: 512).

CONCLUSION

In the literature, there are studies on the diagnostic criteria and symptoms of sexual abuse and neglect. Apart from this, studies can be conducted to evaluate the preventive programs in child sexual abuse related to physical, emotional and neglect issues. On the other hand, the society and health personnel who play a key role in revealing the incident with preventive studies; It is suggested that studies and applications on first-level, second-level and third-level intervention steps and related measures can be carried out in cooperation with the Ministry of

Health, Ministry of Family and Social Policies in studies evaluating nurses' knowledge and intervention skills on this subject.

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EMPOWERING PARENTS WITH A CHILD WITH SPECIAL NEEDS: PUBLIC HEALTH NURSE AS A COMMUNITY HEALTH ADVOCATE

Ecem ÇİÇEK GÜMÜŞ[1]

Abstract: Parents with disabled children are among the groups that should be supported and prioritized in the society. Being the parent of individuals with special needs (ISN), who are described as fragile, also brings various burdens. Because the child with special needs (CSN), which causes the deterioration of the usual situations in family life, can negatively affect the lives, emotions and behaviors of family members. Parents experience great disappointment and devastation by the fact that their child's disability is irreversible. In this sense, the differentiation of parenting roles causes them to experience various problems by dragging them into a complexity and confusion. They may hold themselves accountable, blame, and feel shame for their child's condition. With the combination of many factors, parents may experience high levels of mental problems. Considering these situations, it can be understood that empowering parents in many ways is important. Public health nurses among the nurses play an important role in this context; it play an important role in the protection, support and strengthening of community mental health. Among the care priorities of the public health nurse are the recognition, protection and health promotion of special and risky groups. Strengthening the families of CSN needs directly contributes to the empowerment of CSN. In this context, the public health nurse comes to the fore especially with the role of public health advocate. Advocacy is a powerful resource for community cohesive nursing. Advocacy, in public health advocacy, aims to keep deaths and disability to a minimum in groups of people.

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That is, advocacy involves using information and resources to mitigate significant public health problems or events that are likely to arise. When the public health nurse takes an active role, as a community health advocate, she can empower parents with CSN and thus strengthen the society. In this context, it can be indicated that it will contribute significantly to the protection and maintenance of the mental health of the society.

Keywords: Child with Special Needs, Parent, Advocacy, Public Health Nursing

INTRODUCTION

Individual with special needs (ISN); It is defined as "a person who is affected by the attitudes and environmental conditions that restrict his/her full and effective participation in society on equal terms with other individuals due to the loss of his/her physical, mental, spiritual and sensory abilities at various levels".[2] Living with various deficiencies, that is, having special needs, is part of being human. At a certain point in their life, almost everyone has the risk of weakening, perhaps temporarily or permanently. People who live for many years are also more likely to face increasing difficulties in performing their functions. It is known that ISN constitute an important part of the society not only in our country but also all over the world (Oral et al., 2016). For ISN in the resources utilized; concepts such as disabled, developmental delay or disability, and disabled have been defined. In this context, the concepts of ISN and disability were preferred and used.

It is stated that one billion ISN live in the world. In the light of these data, it is estimated that 15% of the world population consists of ISN (United Nation, 2019). According to the data of the Global Burden of Disease study, the number of children with special needs (CSN) (0-14 years) in the world is estimated to be 95 million, and 13 million of them are classified as "severe disability". It is stated that there are 93-150 million CSN under the age of 14 globally.[3] It is known that at least half of

2 T.C. Resmî Gazete, https://www.resmigazete.gov.tr/eskiler/2014/02/20140219.htm, Access date: 02.04.2022

3 World report on disability. 2011. https://www.who.int/disabilities/world_report/2011/report.pdf, Access date: 02.04.2022

this number are out of school and only 65 million of them are included in education (United Nations, 2016). According to the 2016 data of the Turkish Statistical Institute (TUIK), it is stated that 8.7% of the population of ISN in Türkiye consists of children (TUIK, 2019). When the world and Türkiye data are examined, it is seen that the number of CSN is quite high. When the parents who are responsible for the care of the child are included in the number of special needs, it is possible to say that tens of thousands of people are affected by this situation and there are problems in many areas.

HEALTH CONDITIONS/PROBLEMS of INDIVIDUALS WITH SPECIAL NEEDS

Trends in Health Conditions Accompanying Their Special Needs

Infectious Diseases: Infectious diseases can cause regurgitation or can be defined as regurgitation. In low- and middle-income countries, 9% of life years spent with disability are due to infectious diseases. Lymphatic filariasis, tuberculosis, HIV/AIDS and other sexually transmitted diseases are at the forefront of these diseases. These are followed by childhood cluster diseases such as encephalitis, meningitis, diseases with neurological consequences, measles, mumps and poliomyelitis (WHO, 2008).

Non-Communicable Chronic Diseases: Diabetes, cardiovascular diseases (heart disease and stroke), mental disorders, cancer and respiratory diseases are on the rise worldwide and will have a profound impact on disability. In low- and middle-income countries, 66.5% of all life years spent with disability are due to these diseases (WHO, 2008).

In rapidly developing regions, large increases in the number of years lost due to disability related to non-communicable diseases are expected to continue. Among the reasons for the above-mentioned trend, there are many factors such as aging of the population, decrease in infectious diseases, low fertility and changes in lifestyles due to tobacco, alcohol, diet and physical activity.[4]

4 Dünya Engellilik Raporu, 2011. https://www.engellilerkonfederasyonu.org.tr/wp-content/uploads/2020/04/D%C3%BCnya-Engellilik-Raporu-2011.pdf, Access date: 15.05.2022.

Support for Persons with Disabilities Living in Conflict Areas: Armed conflict environments can lead to disability due to the injuries and traumas they cause. The situation of injured people is exacerbated by delays in accessing emergency medical services and long-term rehabilitation services. An assessment conducted in Gaza in 2009 identified the following problems (WHO, 2009).

- Complications and long-term disability from traumatic injuries and lack of appropriate follow-up services,
- Complications and untimely deaths in individuals with chronic diseases due to interruption of treatment and delay in access to health services,
- Hearing loss caused by explosions becomes permanent due to the lack of early screening and appropriate treatment,
- They are long-term mental problems that arise due to a constant lack of security and protection.

Injuries: Injuries due to traffic accidents, work accidents, violence and humanitarian crises have long been considered among the contributing factors to disability. However, very limited data are available on how much these factors contribute. Injury surveillance studies generally focus on death and situations requiring acute care. For example, as a result of traffic accidents, 1.2 to 1.4 million people lose their lives and 20-50 million people are injured every year in the world.[5] However, the number of people who become disabled due to traffic accidents is not so well recorded. It is estimated that 1.7% of years lost with disability (YLD) are due to traffic accidents, and 1.4% to violence and war/conflict situations (WHO, 2008).

Demographic Factors

Elderly individuals: Aging seriously affects disability trends around the world. There is a direct relationship here: the risk of disability increases in aging individuals. The world population is aging at an unprecedented rate. The fact that disability rates are higher in aging individuals indicates lifelong health risks due to illness, injury and chronic

5 Dünya Engellilik Raporu, 2011. https://www.engellilerkonfederasyonu.org.tr/wp-content/uploads/2020/04/D%C3%BCnya-Engellilik-Raporu-2011.pdf, Access date: 15.05.2022.

illness. The prevalence of disability in people aged 45 and over is higher in low-income countries than in high-income countries, and in women than men (WHO, 2008).

Children: Estimates of the prevalence of children with disabilities vary considerably according to disability definition and criteria. As stated above, the number of "moderately or severely disabled" individuals in the 0-14 age group in the Global Burden of Disease Survey is 93 million (5.1%); 13 million (0.7%) of these are severely disabled (WHO, 2008). A child's functions should not be considered in isolation from the family context and social environment. In developing countries, children under the age of 5 are exposed to risks that may adversely affect cognitive, motor and social development, such as poverty, malnutrition, low health level, and unsuitable home environments. Factors that increase the risk of disability in children on screening are a lack of breast milk or vitamin A supplementation. As the level of developmental disorders and weakness increases, the risk of disability also increases. It is estimated that approximately 200 million children under the age of 5 do not reach their cognitive and social-emotional development potential. Children who test positive for high disability are also more likely to have the following characteristics than other children:

- ✓ Living in poorer households,
- ✓ Being exposed to discrimination, having limited access to social, services and early education opportunities,
- ✓ Having low weight and developmental disorders,
- ✓ Exposure to severe physical punishment from their parents.

Health conditions affected by environmental factors: Environmental factors vary greatly; because the problems of poor hygiene conditions, malnutrition, inability to access health services (such as vaccination) are at different levels in different parts of the world and are closely related to other social phenomena such as poverty, which is one of the risk factors for disability. The environment in which people live has a large impact on the prevalence and level of disability. Environmental changes caused by situations such as major natural disasters and conflict/war environments will also change the prevalence of disability by

creating different disabilities and barriers in the physical environment. Conversely, campaigns to change attitudes towards people with disabilities and reorganizing the transport system or public infrastructure to increase accessibility for people with disabilities will remove many of the barriers they have to deal with and increase their level of participation in society. Other environmental changes include personal support for people with disabilities; specially designed or adapted tools and devices can be counted as modifying rooms in line with the requirements of home or workplace environments or helping them meet their needs.[1]

CHALLENGING SITUATIONS FACE BY PARENTS WITH SPECIAL NEEDS CHILDREN

Having a CSN is a multidimensional problem that needs to be dealt with. For parents, having a CSN brings with it economic, social and psychological problems. In this sense, when parents learn that their children have any disability or inadequacy, they experience stress in many ways (Takuri, 2014). It is known that parents primarily experience emotions such as "horror, indecision, denial, guilt, grief, shame, self-pity, sadness, depression, and wishing their children to die" (Costa et al., 2020). It is known that families with CSN cannot be satisfied with their marriage, their care burden increases, and this can lead to adjustment problems within the family (Al-Krenawi et al., 2011). Parents may experience various problems in their interpersonal relationships, especially in their marriage and emotional relationships (Takuri, 2014). Changes in family roles and expectations regarding family roles further increase the stress and anxiety experienced by parents (Costa et al., 2020). In addition, the disconnection between reality and expectations paves the way for parents' feelings of sadness, shock, anger and guilt (Bumin et al., 2009). In addition, giving care to a CSN causes an increase in the anxiety and stress-inducing factors of the caregiver and the burden of care. This situation causes negative effects on the physical and mental health of the caregiver (Murphy et al., 2007). Parents have to deal with their children's characteristics such as physical limitations, inadequacies in self-ca-

1 Dünya Engellilik Raporu, 2011. https://www.engellilerkonfederasyonu.org.tr/wp-content/uploads/2020/04/D%C3%BCnya-Engellilik-Raporu-2011.pdf, Access date: 15.05.2022.

re skills, reduced mental functionality and limited social skills, as well as challenging behaviors (Kwok et al., 2014).

Living with a CSN is a situation that can affect family members socially, psychologically and economically. While the mother and father experience stress in the face of this difficult situation, they also have difficulty in fulfilling the requirements of daily life (Takuri, 2014). The need for time, money and energy for the care of the child and the emotional distress they bring cause an increase in the stress of parents (Costa et al., 2020). At the beginning of the situations that increase the care burden and stress of parents with CSN; uncertainty and ignorance, which begin the day the child is diagnosed, play an important role. Insufficient information given by health professionals about the care of children or the inadequacy of the service provided cause them to experience intense stress (Opoku et al., 2020). Families often lack experience in coping with intense stress and long-term problems. In this case, they have to experience many mental and behavioral problems. It is seen that one of the most important problems that may arise due to inadequate coping with the family is depression (Carlson and Miller, 2017). Fatigue, irritability, sadness and fear are generally reported in people with depression symptoms (Benson and Karlof, 2009). Decreased positive parent-child relationships and interactions may occur between depressed parents and their children. This situation may cause the relationship between parent and child to break (Sawyer Cohen and Semple, 2010).

The mental problems that parents experience from their CSN increase their burden of care or cause them to perceive the burden of care more (Metin Karaaslan and Çelebioğlu, 2018). This may lead to an increase in stress levels (DeLambo et al., 2011). As the care burden of parents increases due to their CSN, the levels of depression, anxiety, negative self and general psychological problems also increase (Metin Karaaslan and Çelebioğlu, 2018). However, the most important predictor of parental stress was the child's social abilities, and it was shown that decreased social competence in children was associated with increased parental stress levels. Likewise, the child's external problematic behaviors are also associated with increased parental stress (Davis and Carter, 2008). The results of various studies have shown that parents CSN have a high

rate of stress, anxiety, depression, and an increased burden of care (Hamarta and Özteke-Kozan, 2019; Weiss et al., et al., 2013; Dykens et al., 2014; Özmen and Çetinkaya, 2012; Azeem et al., 2013; Kaçan Softa, 2012; Opoku et al., 2020), economic, social and various psychological problems (Takuri, 2014), loneliness, mental and behavioral problems, inability to cope (Carlson and Miller, 2017) and adjustment problems within the family (Al-Krenawi et al., 2011).

Care Burden

The concept of burden is used to explain the negative effects of the caregiving process on individuals. When the literature is examined, the concept of load; It is defined as negative subjective and objective results such as psychological distress caused by the care provided by caregivers, physical health problems, social problems, economic troubles, deterioration in family relationships, and feeling that the person is not in control (Durmaz, 2015). In this context, the burden of care is explained in two different frameworks as objective and subjective burden.

Objective load; it includes changes and restrictions in the life of the family as well as the caregiver. In general, the objective burden refers to the difficulties experienced during caregiving and the verifiable and observable aspects of the family burden experienced. Verifiable and observable; situations such as economic problems and loss of income caused by the current illness of the caregiver, disturbing behaviors, restrictions in daily life and social activities, tension in the home and family, negative effects on the mental and physical health of family members can be listed (Kızılırmak, 2014). The concept of subjective burden is a concept that explains how much these difficulties disturb family members. The changes that family members feel in their emotional states are defined as subjective burden (Yıldırım, 2014).

As family caregivers, parents of CSN experience psychological, physical, social and economic problems during care (Orak and Sezgin, 2015). The burden of care and the problems experienced are experienced in different dimensions in relation to caring for individuals with disabilities or special needs (Karahan and İslam, 2013), giving care to CSN causes

parents to experience much more serious care burden. Studies conducted in this area also reveal that the care burden of parents is higher than others (Karahan and İslam, 2013; Putra et al., 2017; Sarpdağı, 2018).

Depression

Depression is defined as experiencing sadness for several weeks and having negative effects on mood, body and thought.[2] Depression; it is a common, global mental disorder/psychological disorder that can be seen in children, adolescents, adults and the elderly. It affects all kinds of human health physically, mentally and socially. It manifests as a combination of feelings of loss of interest, loneliness, irritability, worthlessness, hopelessness, sleep and eating disorders, difficulty concentrating, guilt, tension and sadness accompanied by multiple physical complaints (Aldabal et al., 2015; Sharp and Lipsky, 2002). The depressed person feels anxious, helpless, worthless and unhappy, withdraws from the environment and people, nothing gives him/her pleasure, may think about suicide or attempt suicide. He/she has a slowdown in using his/her thinking ability and may have problems focusing. In relation to these, the person may feel tired and have trouble sleeping (Demir, 2014). An average of 10-30% of those with depression may not be able to overcome depression at first (Al-Harbi, 2012). Depressed individuals may want to punish themselves. It can also show a desire to escape from life, to hide, and often to get rid of it completely. Some may feel that their energy is running out and may seem lethargic and indifferent (Yalom, 2012).

Compared to other parents, it is emphasized that parents with CSN experience depression at a significant rate (Akça and Özyürek 2019; Azeem et al., 2013; Dykens et al., 2014). Parents with CSN, who are known to experience more intense depression than other parents, have less positive parent-child relationships with their children under the effects of depression. At the same time, the fact that their communication and interactions are more limited with their children may cause them to distance themselves from each other (Sawyer Cohen and Semple, 2010).

2 The National Institute of Mental Health (NIMH), https://www.nimh.nih.gov/health/topics/depression/index.shtml, Access date: 02.04.2022

Anxiety

Anxiety or worry is a feeling of restlessness and worry that results in an overreaction as a state of tension, fear, and irritable behavior to a situation that is usually seen as a threat by the individual. It can also be explained as a state of uneasiness of unknown origin (Bouras and Holt, 2007). Anxiety in this way can cause the person to stop doing things they enjoy. If anxiety, which negatively affects the life of the individual, is not treated, its level will continue to worsen (American Psychiatric Association, 2013).

Anxiety is a physiological and psychological condition. This situation can be explained by some components. These components are: somatic, emotional, behavioral and cognitive. These components often do not create good feelings in the person, they create fear and anxiety. Anxiety is a state of mind that occurs without any specific stimulus (Seligman et al., 2001). Symptoms such as dizziness, chills, hot flashes, shortness of breath, feeling of suffocation, chest tightness, chest pain, palpitations, sweating, feeling of fainting, self-alienation, anxiety about going crazy, nausea or abdominal pain, fear of death are the symptoms that the individual feels in case of anxiety (American Psychiatric Association, 2013).

Anxiety and its effects are largely experienced by parents with CSN (Tura, 2017). Studies have shown that parents with CSN experience extreme anxiety when compared to other parents (Akça and Özyürek, 2019; Hodge et al., 2011; Poddar et al., 2015). It is obvious that the lives of parents who have CSN, who experience the effects of anxiety and who are known to experience anxiety very often, are adversely affected.

Stress

Stress is a situation that occurs when the physical and mental limits of the organism are threatened and forced. Stress belongs to the person who carries it in their mind. The response to stress is not related to what happens in the environment. It arises in connection with how a person responds to the situation that occurs. Stress is also used instead of terms such as anxiety, tension, conflict, self-threatening, emotional depression, compelling external conditions, frustration, threat to security, and arou-

sal. Stress can be the result of overstimulation that damages the mind and body (Gibbons, 2012). Physical symptoms such as headache, increased blood pressure, digestive problems, difficulty in breathing, and excessive sweating can be observed in those who experience stress. A stressed individual may be anxious, feel angry, tense, unhappy, and irritable. He/she may have difficulty concentrating on anything he does, may have difficulty in making a decision, may fall into pessimism, and his/her eating and sleeping habits may deteriorate (Demir, 2014). Parents with CSN who experience stress have difficulty in fulfilling the requirements of daily life due to the effects of stress, have problems in their interpersonal relationships (Takuri, 2014), deal with various psychological problems and accompanying diseases (Dykens et al., 2014).

The Role of Public Health Nursing in Community Mental Health Services

Public health nurses use nursing processes in their relationships with individuals, families, groups, populations and communities. The scope of the service provided by public health nurses includes the protection, improvement and development of the health of the total population or society. Family health plays an important role in public health. The focus of the public health nurse is to create a healthy society by caring about the health of the individual and the family (Maurer and Smith, 2014; Truglio-Londrigan and Lewenson, 2017).

The new nursing approach supports the individual's active participation in care and finding options that will improve their own self-care power in the development of health. With this approach, the public health nurse identifies the problems by closely following the individual, family and society. It determines the service it will provide and ensures the active participation of the target group (Maurer and Smith, 2014; Truglio-Londrigan and Lewenson, 2017). The public health nurse plays a key role in determining community mental health problems within the scope of the service and target audience (Schoon et al., 2018).

Nurses undertake roles and responsibilities such as care, education, counseling, case management and psychotherapy practices in various

community groups for individuals with mental problems and their families (Sines et al., 2013). In the community mental health system, the nurse's role can be confused with the traditional roles and functions of other mental health professionals. The working area of community mental health nurses is not limited to community mental health centers. He also works in day care centres, homeless shelters and schools. In these different environments, nurses function in direct or indirect roles. Direct roles; clinician, therapist, educator, case manager. Indirect roles; consultant, case manager, researcher, trainer, change agent (Gorman and Sultan, 2008).

Practices in community mental health services include primary, secondary and tertiary prevention services. primary prevention; these are the practices that prevent the emergence of the disease by taking the necessary preventive measures before the emergence of mental health problems. Secondary prevention; these are practices that aim to reduce the prevalence and duration of mental illnesses in individuals, families, groups and societies through early diagnosis, treatment and care. Interventions aimed at reducing the physical and social consequences of existing disorders or disability include tertiary prevention services (Sines et al., 2013; Yıldırım and Hacıhasanoğlu Aşılar, 2019).

In the Nursing Regulation in Türkiye, Community Mental Health Center Nurse is defined as a member of the health team who is involved in the protection, development and maintenance of the mental health of the individual, family and society (Ministry of Health, 2011). In the context of this regulation, the importance of the public health nurse in community mental health services was once again emphasized. As a Community Mental Health Center Nurse for the protection and support of the mental health of the ISN and their families, the duties, authorities and responsibilities of the public health nurse are arranged according to the regulation:

It has the responsibility of creating supportive programs by taking part in the protection and maintenance of the mental health of ISN and their families, who are at risk of mental health deterioration and are considered fragile. A public health nurse can provide individual or group counseling, form support groups and provide psychosocial support for individuals who are found to be experiencing developmental, situatio-

nal and social crises. It supports the use of appropriate support services and social support resources by the individual in individuals with mental problems. It provides training and consultancy services on issues such as coping with stress, anger control, and crisis management. It supports the family and the individual in the process of adapting to the new situation.

It is the responsibilities of the public health nurse to cooperate with the leaders in the society to ensure that the ISN and their families develop positive health behaviors and to mobilize them and to provide multidisciplinary service. As stated in the regulation, the role of the public health nurse is important in protecting and supporting the mental health of CSN and their families.

The Role of the Public Health Nurse in Supporting Parents with Special Needs Children

In line with the policies and updates carried out by public health nurses; they have a serious role in supporting ISN and their families by providing qualified, personalized, individualized and coordinated services (Sines et al., 2013). Among the roles and care priorities of the public health nurse are the recognition, protection and health promotion of special and risky groups (Maurer and Smith, 2014).

It is a priority for public health nurses to determine the care needs of the society well and to determine the care needs of parents or caregivers, especially those with CSN. In this direction, practices to increase and support the social welfare of individuals are carried out by public health nurses and other service providers (Schoon et al., 2018; Truglio-Londrigan and Lewenson, 2017). The public health nurse is responsible for the caregivers and other family members as well as the ISN to whom he/she provides home care. The follow-up of not only sick individuals, but also healthy individuals is within the scope of the health service of the public health nurse. Since the ISN will also affect the family members, the family should be evaluated as a whole (Maurer and Smith, 2014).

The burden of care for parents with CSN is high. The fact that they have to provide continuous care leads to difficulties in their parenting roles, weakening and a decrease in their ability to provide care. This can

have a negative impact on the health of the parents, the functioning of the family, and the potential health outcomes of the CSN. Nurses are in a unique position to help these families. Knowing how the parents of children with special health care needs experience their daily lives can help nurses feel confident in planning their interventions. This can guide them in their efforts to support families (Nygård and Clancy, 2018).

Parents with CSN have difficulties because of their children and therefore they can call support call centers. There is insufficient support and training for parents and there is not enough documentation in this area. The exclusion of CSN and the lack of sufficient knowledge in their care increase the burden and problems of the family. In addition to providing social support for ISN and their relatives, the importance of intensive community education upon its acceptance is emphasized (Opoku et al., 2020). Social support has been identified as a vital resource for families with CSN. Sociodemographic variables, children's behavior problems, access to information and use of social support systems are important for parents (McIntyre and Brown, 2018).

The majority of parents are informed about their CSN when they are first diagnosed. However, education and support needs in many areas such as the child's behavior, raising, physiological needs, and self-care are not fully met (Opoku et al., 2020). It takes constant effort for parents to manage the behavior of CSN. This shows that parents need significant help from support services and health professionals (Collings et al., 2017; McIntyre and Brown, 2018). Public health nurses are important for the groups they serve, and they need to continue their practices by developing and receiving support (Sines et al., 2013). In this context, multidisciplinary studies should be carried out with other health professionals. Public health nurses should work in collaboration with policy makers because they are influential on decision makers (Maurer and Smith, 2014).

Public Health Nurse's Roles in Supporting Parents of Disabled Children

Counseling role: The public health nurse provides counseling in solving the problems that individuals and families with disabilities have

difficulty in solving and that bother them. With the counseling provided, individuals are encouraged to think about their own problems, find their causes, and make decisions about solutions to problems.

Caregiver: Since the focus of public health nursing is to protect the whole society from disease and support its health, it is responsible for providing care to the individuals in the society. While giving service, public health nurse should give priority to individuals who are at risk and need more in order to foresee possible problems in the society and take precautions.

Advocacy: The public health nurse advocates for the health of the community. It makes the society sensitive to the existing or potential problems in the society. It works as a spokesperson for the people on the issues that the society needs.

Manager and leadership: As in all other nursing fields, the public health nurse is responsible for the management of the service it provides to individuals and families in the community. The public health nurse works in a team with other healthcare professionals. Sometimes as a member and sometimes as the leader of this team, he contributes to the solution of health problems. While doing these, he/she manages and supervises the team members in communication with the team members.

Educational role: It is the most comprehensive nursing role given to the society to provide health education for the problems of the society, the public and the individual. It is one of the important roles of the public health nurse to provide training in order to improve and protect the health of healthy or sick individuals, families and the society and to provide the right health behaviors. For this purpose, planned training should be done by using different training methods.

In order to scientifically define and solve health problems, it is necessary to conduct research in the society served. Based on the observations made by the public health nurse during their practice, they can identify the problems that need to be investigated in the society. It can contribute to the prevention of mistakes by ensuring that a research that needs to be done in the society is carried out in accordance with its purpose. Can use the results of researches in nursing care.

COMMUNITY HEALTH ADVOCACY

Advocacy is a powerful resource for community-oriented nursing. There are several definitions, but two definitions are preferred by Christoffel that show the difference between public health nursing and community health nursing. The definition that seems appropriate for community health nursing; Advocacy is the use of knowledge and resources to shape effective systematic changes in community life. Conversely, in public health advocacy, advocacy aims to reduce deaths and disability in groups of people. That is, advocacy involves using information and resources to reduce significant public health problems or events. Advocacy is addressed to the codes and standards of the application. There are three records here. The ethical codes of the ANA and the Public Health Leadership of Society, and the goals and standards of Public Health Nursing practices. According to ANA (2001) Code of Ethics for Nurses with interpretive Statements; The nurse strives, defends and controls the patient's rights, safety and health (Silva et al., 2003).

According to the Society of Public Health Leaders (2001) Public Health Code of Ethics; it aims to provide the necessary conditions and basic resources for health that can be accepted by everyone. It works and advocates to strengthen the exposure of community members (Silva et al., 2003). According to ANA (1999), Scope and Standards of Public Health Nursing Practice; uses culture when advocating for health care standards in establishing ethical standards (Silva et al., 2003).

Components of Advocacy

According to Christoffel, public health advocacy includes two components: the product and the process. The end product is reduced morbidity and mortality. The intermediate occurs at the individual/family (more community health compliant) level and is extended to the family/community level (more public health compliant). For example, at the individual/family level, the product includes healthy diet, stress reduction and prenatal care. For example, at the family/community level, the product includes reducing environmental hazards (such as pollution) and establishing community actions (school-based health services) (Sil-

va et al., 2003). Additionally, Christoffel describes the process involving public health advocacy:

I. Define the problem,

II. Research and collect data,

III. Education that includes professional and clinical training, as well as creating public health policies,

IV. Development and support of laws and regulations,

V. Supporting laws and regulations through elections and government activities,

VI. Implementing effective policies,

VII. Evaluating the political process and outcomes,

Conceptual Framework of Advocacy

Christoffel defines the conceptual framework of advocacy in three phases: the knowledge phase, the strategy phase, and the action phase. The information phase focuses on collecting data on public health problems. The strategy phase focuses on tactics, working with lawmakers, building coalitions, making objective definitions, presenting the political situation and information gathered. In the implementation phase, it focuses on implementation through tactics (Silva et al., 2003).

The framework of practice of advocacy: The core competencies of advocacy include six ethical principles for effective advocacy (Silva et al., 2003).

Ethical Principles for Effective Advocacy

1. Gives the best attention to the customer (groups, community).

2. Takes actions in line with the wishes and desires of the client (groups, communities).

3. Stores information about the customer.

4. Provides rigorous and comprehensive training

5. Provides sincere, independent advice and apply it impartially

6. Protects the privacy of the client (Silva et al., 2003).

Nursing Advocacy

Many private health care groups have the potential to fund policies that affect the public health process. Nursing has enormous advantages, has a significant number among health professionals, and influences policy makers. Public health professionals and professionals use advocacy to bring about positive change in nursing care and society. It is vital that professional organizations try to deal with government on legislation and public health policy (Betts and Kirkland, 2003).

ETHICS CODES

Table 1: Conformity of Ten Basic Public Health Services and 12 Ethical Principles[3]

Basic Public Health Services	Code of Ethics
Monitoring health status to identify community health problems	(5) collecting information (7) act on knowledge
Diagnosing and investigating health hazards and health problems in the community	(5) collecting information
Informing, educating and empowering people about health issues	(4) defense and authorization (6) give information
Mobilizing community partnerships to identify and solve health problems	(12) cooperation
Developing policies and plans that support individual and community health efforts	(1) the protection and promotion of health; tell the root causes of health risks (3) processes for community entry (5) gather information

3 Principles of the Ethical Practice of Public Health, Version 2.2 © 2002 Public Health Leadership Society https://www.apha.org/-/media/files/pdf/membergroups/ethics/ethics_brochure.ashx, Access date: 15.05.2022

Enforce laws and regulations that protect health and ensure safety	(2) achieving public health with respect for individual rights (3) feedback from the community (7) act on knowledge
If maintenance is not available; link people to the personal health care they need and to the provision of health care conditions	(4) advocating authorization to use publicly available essential resources (8) combining diversity
Ensuring a competent public health and personal health care workforce	(11) professional qualification
Evaluate the effectiveness, accessibility, and quality of personal and population-based health care	(3) community feedback (5) collecting information
Seeking new insights and innovative solutions for health problems	(5) collecting information
No response to necessary public health services	(9) strengthen physical and social environments (10) protect privacy

ANA Codes of Ethics for Nurses

Provision 1: The nurse treats each person with compassion and respect for their inherent dignity, worth, and personal characteristics, without prejudice.

1. Respect for human dignity

2. Relationships with patients

3. The nature of health

4. The right to self-determination

5. Relationships with colleagues and others

Provision 2: The nurse's primary responsibility is to the patient (whether individual, family, group, community, or population.)

1. Priority of patient's interests

2. Conflict of Interest for Nurses

3. Cooperation

4. Professional boundaries

Provision 3 The nurse protects, defends and promotes patient rights, health and safety.

1. Protection of privacy and privacy rights

2. Protection of human participants in research

3. Performance standards and review mechanisms

4. Professional competence in nursing practice

5. Protection of patient health and safety upon suspicious application

6. Patient protection and blocked application

Provision 4: The nurse has authority, and responsibility in nursing practices, takes appropriate actions and takes decisions with the obligation to provide optimal care.

1. Authority, accountability and responsibility

2. Accountability for nursing decision, decisions and actions

3. Nursing decision, decisions and responsibility for action

4. Nursing activities or delegation of duties

Provision 5: The nurse owes the same duties to herself as anyone else, including the responsibility to promote health and safety, maintains integrity of character and integrity, maintains competence, and continues personal and professional growth.

1. The task assigned to oneself and others

2. Promotion of personal health, safety and well-being

3. Character Integrity

4. Protection of integrity

5. Maintaining competencies and professional growth

6. Personal growth

Provision 6: The nurse, through individual and collective action, creates, maintains and improves the ethical conditions of the work environment and employment conditions conducive to quality health care.

1. Environment and moral virtue and values

2. Environment and ethical obligation

3. Responsibility for the health care environment

Provision 7: The nurse contributes to professional advancement, whether in research, practice, education, or management, through research and academic review, professional standards development, and the formulation of nursing and health policies.

1. Contributions through research and scientific inquiry

2. Contributions through maintaining and enforcing professional practice standards

3. Contribution through nursing and health policy development

Provision 8: The nurse collaborates with other health professionals and the public to protect and promote human rights, health diplomacy, and health initiatives.

1. Health is a universal right

2. Cooperation for health, human rights and health diplomacy

3. Obligation to promote health and human rights

4. Cooperation for human rights in complex and extraordinary practice environments

Provision 9: The nursing profession should collectively express nursing values through professional organizations, protect the integrity of the profession, and incorporate social justice principles into nursing and health policy.

1. Expressing values

2. Integrity of the profession

3. Integrating social justice

4. Social justice in nursing and health policy.[4]

ICN Nursing Ethics Codes

The ICN Code of Nursing Ethics, revised in 2012, is a guideline for action based on social values and needs. Since the principle was adopted in 1953, it has provided standards for nurses around the world. Codes are regularly reviewed and revised in response to the realities of nursing and health care in a changing society. The codes make clear that nursing inherently respects human rights, including the right to life and treatment with dignity and respect.

Elements of the Code

1. Nurse and People

- The nurse's primary professional responsibility entails nursing care for individuals.
- The nurse respects human rights, values, traditions and spiritual beliefs while providing care to the individual, family and community.
- Nurses provide culturally appropriate, timely and adequate information about care and treatment.
- The nurse secures personal information and uses common sense in sharing this information.
- The nurse shares the responsibility with the community to initiate and support actions to meet the health and social needs of the community, especially the vulnerable population.
- Nurses advocate for equality and social justice in accessing health and other social and economic services and sharing resources.
- The nurse demonstrates professional values such as respect, responsiveness, compassion, reliability and honesty.

4 ANA, Silver Spring, Maryland. The Code of Ethics for Nurses with Interpretive Statements. 2014, https://www.nursingworld.org/practice-policy/nursing-excellence/ethics/code-of-ethics-for-nurses/coe-view-only/, Access date: 15.05.2022.

2. Nurse and Practice

- The nurse carries personal responsibility and accountability for nursing practice and for the preservation of continuing learning competence.
- The nurse maintains personal health standards such as not compromising the ability to provide care.
- The nurse acts with common sense regarding individual competence when accepting and delegating responsibility.
- The nurse always maintains standards of professional reflection, improving her image and personal behavior in public safety.
- Nurses use technological and scientific developments while providing care, in line with safety, dignity and human rights.
- The nurse seeks to develop and maintain a culture of practice through the promotion of ethical behavior and open dialogue.

3. Nurses and the Profession

- The nurse plays a major role in the implementation and determination of acceptable standards in clinical nursing practice, management, research and education.
- The nurse is active in developing the core of research-based professional knowledge that supports evidence-based practice.
- The nurse is active in the development and maintenance of the core of professional values.
- The nurse participates in creating a positive work environment and fair social and economic working conditions in nursing, acting through the professional organization.
- The nurse is aware of the health consequences of protecting the natural environment.
- The nurse modifies unethical practices and settings and contributes to the ethical organizational environment.

4. Nurse and Colleagues

- The nurse works with colleagues in nursing and other fields. Maintains a cooperative and respectful relationship
- The nurse takes appropriate measures to protect individuals, families and communities whose health is at risk,
- The nurse takes appropriate measures to support and guide colleagues to advance ethical behavior
- The nurse takes appropriate measures to support and guide colleagues in developing ethical behavior.[5]

CONCLUSION

Considering the physical and mental discomforts of having a CSN; the importance of empowering and supporting parents with CSN emerges once again. Supporting parents is extremely important not only for individual but also for familial and social well-being. Parents with increased resilience, in complete well-being, can have happier marriages, a healthier family life, and happier healthy children. In this process from the individual to the society, supported family life will feed the social peace and well-being. In this sense, there is no doubt that nurses are among the professional group that has important roles and responsibilities that can be pioneers. Nurses who can provide multidimensional services within the scope of community mental health nursing are also public health nurses. Public health nurses can evaluate and support both the individual, the family and the society at the same time and can best identify vulnerable groups within these segments. While fulfilling these, public health nurses especially take on the role of advocacy. The public health nurse provides consultancy in solving the problems experienced by individuals and families with special needs through empowerment-based trainings; It can encourage individuals to think about their own problems, find their causes, and make decisions about solutions to problems.

5 ICN. THE ICN CODE OF ETHICS FOR NURSES. International Council of Nurses Revised 2012 http://www.icn.ch/images/stories/documents/about/icncode_english.pdf, Access date: 15.05.2022.

It can ensure that parents are sensitive to the problems they experience or may experience by taking on the advocacy of the CSN and their own health. He/she can act as their spokesperson on the issues they need. By managing the education and service it provides to the ISN needs and their family, it can ensure that other health professionals are involved in this process. In this process, it can contribute to the solution of the health problems of individuals and families with special needs by using the empowerment-based trainings and support systems. In this context, with the care he provides to the risk group he trains, he/she can protect them from the diseases that may occur, thus supporting their health. With the empowerment-based training it provides for the problems of CSN and their families; it can contribute to the development and protection of the health of the individual, family and society and to gain the right health behaviors. Evidence-based training can enable the identification of needs and the necessary interventions.

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FEMALE GENITAL MUTILATION

Erhan AKTÜRK[1]

Abstract: Female genital mutilation (FGM) comprises all procedures that involve partial or total removal of the external female genitalia or injury to the female genital organs for nonmedical reasons. According to the World Health Organization, female genital mutilation is classified into four types, subdivided into some subtypes. For this reason, WHO presented a figure of classification and learning chart for health care professionals. In many countries, especially in Africa, it is thought that more than 190 million girls and women alive today have been exposed to the female genital mutilation. Moreover, every year an estimated 3 million girls face risk of undergoing female genital mutilation. Most of the girls are under14 years old. The procedure itself has no health benefits for girls and women. In fact FGM has many risks for both health and human rights. The consequences of FGM last a lifetime. In some regions FGM is being carried out in health facilities by registered doctors and midwives in accordance with the rules mandating the usage of sterile equipment under general or local anaesthesia, despite the fact that all international organisations oppose the FGM. Hospital based procedure does not affect the incidence of short- and long-term complications; it is unethical by all means. FGM is being performed for many sociocultural reasons, differing from one region and group to another. The significant reason is that it is part of the history and cultural tradition of the community. In many areas, it is considered as a rite of passage to adulthood and is also practiced so as to fullfil a sense of ethnic and gender identity in the community. Social acceptance is a leading reason for perpetuating the practice as usual. Besides, protecting virginity before marriage, keeping marriageability high (increasing a girl's probobility of finding a spouse), establishing faithfulness after marriage, protecting

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from rape, allowing a source of income for circumcisers, as well as sense of cleanliness and beauty are all regarded as the reasons of the practice. Fortunately, in the last few decades the world has started to take action in preventing the FGM procedure since it has many health consequences and is against the human rights. Health care providers have a crucial role to fight against the practice and eliminate it to protect the girls.

Keywords: Female Genital Mutilation, Prevalence, Complications

INTRODUCTION

Female Genital Mutilation (FGM), also referred to as Female Genital Cutting, comprises cliterectomy with or without removal of the labia minora or majora, and all kind of harm to the vulva like piercing, cutting, burnt and so on (Yirga et al., 2012). Although mainly it has been being performed in mainly African countries, it is gaining momentum that the World has started to take action in preventing the procedure since it has many health consequences. And due to the high migration rates in the course of time, cases are now seen all over the world. The procedure is performed using a knife or any sharp object by a religionist, a respected elder of the village, or an inexperienced health care Professional. In about 15% of cases, the procedure results in the most devastating type of the FGM which is referred to as infibulation. Infibulation comprises the removal of the labia and the suturing together of the vulva which causes a very small vaginal opening in the distal part of the vagina and eventually having difficult times and complications during having sex, micturation and giving birth (Yirga et al., 2012). The procedure has no known health benefits and is not performed for medical purposes. FGM is commonly considered as a procedure that breaches a women's human rights, as well as increasing their risk for health complications (Donohoe, 2006). In half of the countries performing the procedure, most of females faced the process under the age of 5. In the other countries, most FGM is being performed between the ages 5 and 14. Within a considerable number of countries, majority of girls have had their genitalia cut, with some tissue extracted to some extent. Social acceptance is the most encountered reason for supporting the use of the prosedure.

DEFINITION

Female genital mutilation comprises all procedures that involve partial or total removal of the external female genitalia or injury to the female genital organs for nonmedical reasons. Health care providers for women and girls living with female genital mutilation have reported difficulties in recognizing, classifying, and recording female genital mutilation, which can adversely affect treatment of complications. According to the World Health Organization (WHO), female genital mutilation is classified into four types, subdivided into subtypes. For this reason, WHO presented a figure of classification and learning chart for health care professionals. Since then, the classification evolved into subtypes.[2] The chart can be used by ones who are not sure about the type of female genital mutilation and used for education and surveillance of the prevalence of female genital mutilation types and subtypes. Relative to the normal appearence of the female genitalia (Figure 1), the four major types of FGM, and their subtypes, are:

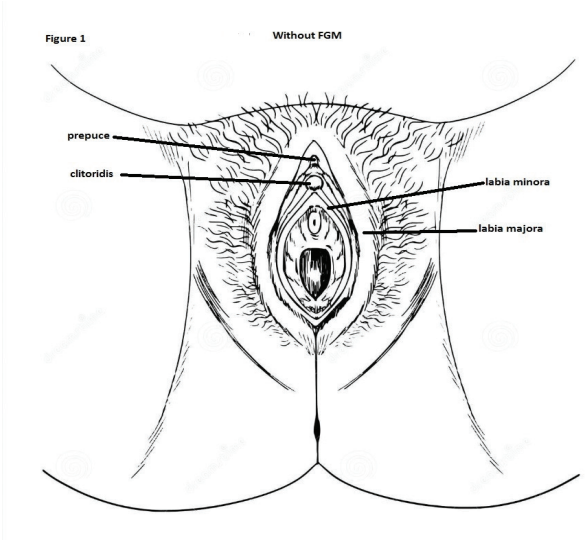

Figure 1: Normal Female Genitalia

2 World Health Organization. (□2008)□. Eliminating female genital mutilation: an interagency statement - OHCHR, UNAIDS, UNDP, UNECA, UNESCO, UNFPA, UNHCR, UNICEF, UNIFEM, WHO. World Health Organization. https://apps.who.int/iris/handle/10665/43839 (Access Date. 5.7.2022)

- Type I. Partial or total removal of the clitoris, and/or the prepuce.
  - Type Ia. Removal of the prepuce only (Figure 2).
  - Type Ib. Removal of the clitoris with the prepuce (Figure 3).

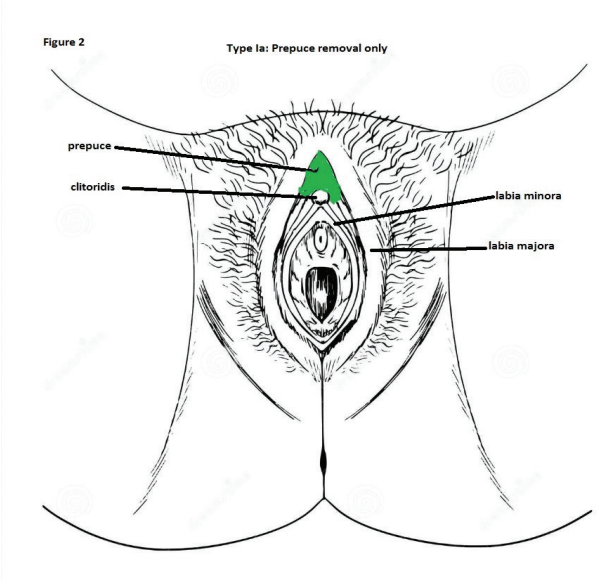

Figure 2: Type Ia. Removal of the Prepuce Only

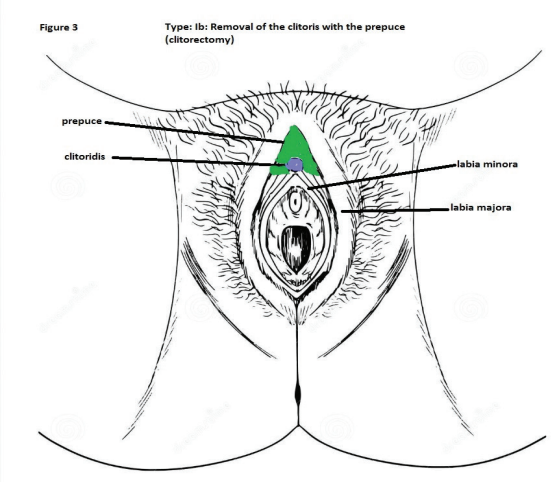

Figure 3: Type Ib Removal of the Clitoris with the Prepuce

- Type II. Partial or total removal of the clitoris and the labia minora, with or without removal of the labia majora.
  - Type IIa. Removal of the labia minora only (Figure 4).
  - Type IIb. Partial or total removal of the clitoris and the labia minora (Figure 5).
  - Type IIc. Partial or total removal of the clitoris, the labia minora and the labia majora (Figure 6).

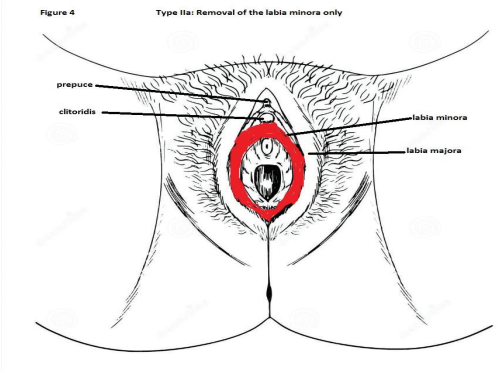

Figure 4: Type IIa. Removal of the Labia Minora Only

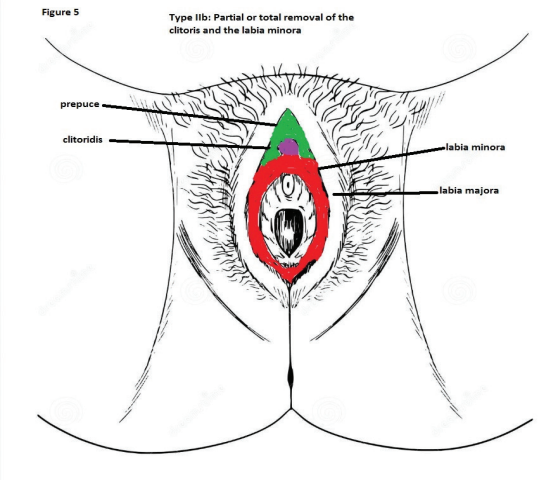

Figure 5: Type IIb. Partial or Total Removal of the Clitoris and the Labia Minora

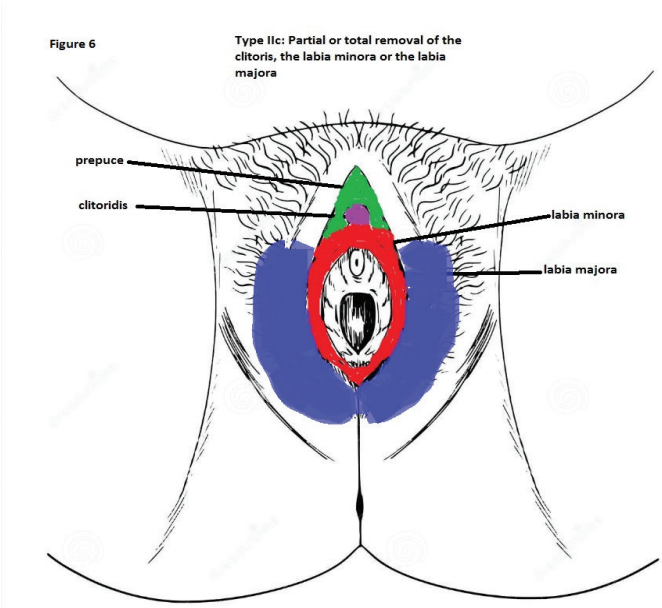

Figure 6: Type IIc. Partial or Total Removal of the Clitoris, the Labia Minora and the Labia Majora

- Type III. (Also referred to as infibulation). Narrowing of the vaginal opening with the creation of a covering seal. The seal is formed by cutting and repositioning the labia minora, or labia majora.
  - Type IIIa. Removal and repositioning of the labia minora (Figure 7).
  - Type IIIb. Removal and repositioning of the labia majora (Figure 8).

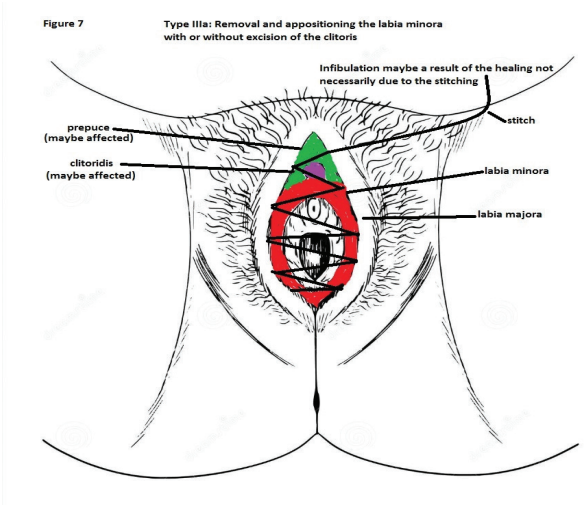

Figure 7: Type IIIa. Removal and Repositioning of the Labia Minora

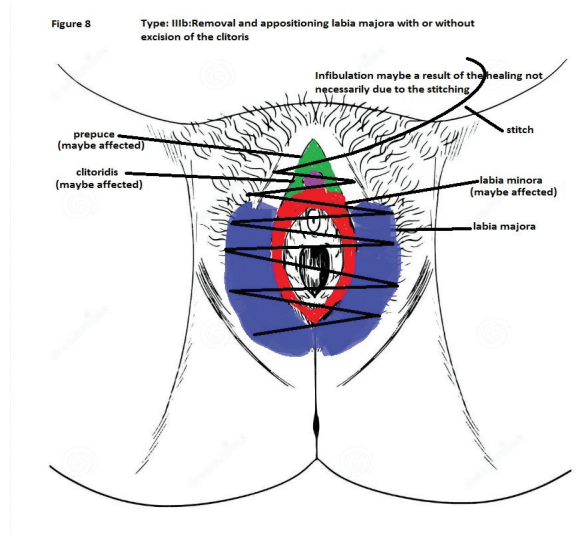

Figure 8: Type IIIb. Removal and Repositioning of the Labia Majora

- Type IV. All other harmful procedures to the female genitalia for non-medical purposes, for example pricking, piercing, incising, scraping and cauterization (Figure 9).

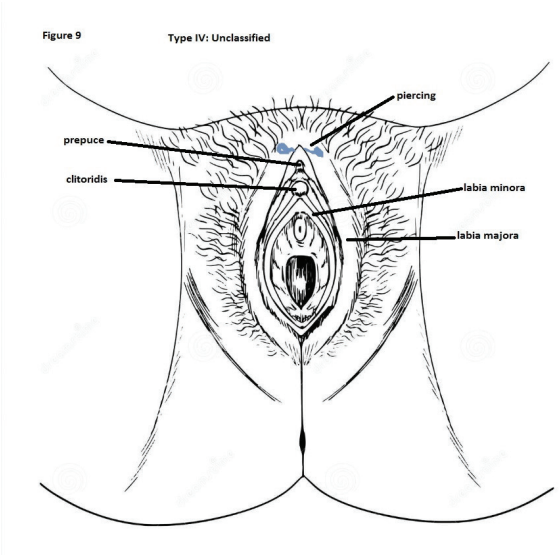

Figure 9: Type IV. Genital Piercing

Deinfibulation refers to the practice of cutting open the sealed vaginal opening of a woman who has been infibulated (Type III). This is often conducted to allow sexual intercourse or vaginal childbirth, and is often necessary for improving the woman's well being. Although there are health risks, some women prefer infibulation again after being deinfibulated, after the childbirth due to the religious beliefs.

PREVALENCE

In many countries, especially in Africa, it is thought that more than 190 million girls and women alive today have been exposed to the female genital mutilation (Donohoe, 2006). FGM is generally performed on young women between infancy and the age of 15, most commonly before puberty (Yirga et al., 2012). Moreover, every year an estimated 3 million girls face risk of undergoing female genital mutilation. Most of the girls are under14 years old.[3]

3 UNICEF. (2016) Female genital mutilation/cutting: A global concern. http://www.unicef.org/media/files/FGMC_2016_brochure_final_UNICEF_SPREAD.pdf (Access Date. 20.6.2022)

Female genital mutilation has been documented in 30 countries, mainly in Africa, as well as in the Middle East and Asia. Some forms of female genital mutilation have also been reported in other countries, including among certain ethnic groups in South America. Moreover, due to the growing migration, prevalence of the condition is getting increased in countries other than of Africa (Wuest et al., 2009).

The prevalence of female genital cutting has been calculated roughly from national surveys inquiring women aged 14–49 years if they have cut or circumcision. Sustainable differences have been found between the countries, with prevalence rates over 80% in some countries (Creighton and Hodes, 2016). In addition, the prevalence changes between regions in countries. Ethnicity is the most responsible factor in these changes (McCaffrey and Gordon, 1995).

The type of procedure conducted also shows difference between ethnicities. Current estimates note that around 90% of female genital mutilation cases comprise either Types I, II or IV, and about 10% are Type III (infibulation) (Creighton and Hodes, 2016). Infibulation, which is the most complicated type of FGM, is mostly being used in the north-eastern Africa especially in Djibouti, Eritrea, Ethiopia, Somalia, and Sudan. In West-Africa mainly in Guinea, Mali, Burkina Faso, type III FGM is seldomly practiced[4]. Table 1 shows FGM prevalences among countries.

Table 1: Female Genital Mutilation Prevalence Among Countries[5]

Country	Prevalence (%)
Benin	9
Burkina Faso	76
Cameroon	1
Central Africal Republic	24

4 UNFPA, UNHCR, UNICEF, UNIFEM, WHO, FIGO, ICN, MWIA, WCPA, WMA. (2010). Global strategy to prevent health-care providers from performing female genital mutilation. http://www.who.int/reproductivehealth/publications/fgm/rhr_10_9/en. (Access Date. 1.7.2022)

5 UNICEF global databases 2016, based on DHS, MICS and other nationally representative surveys, http://data.unicef.org/topic/child-protection/female-genital-mutilation-and-cutting/ (Access Date: 1.4.2022)

Chad	44
Cote d'Ivoire	38
Dijoubti	93
Egypt	87
Eritrea	83
Ethyopia	74
Gambia	75
Ghana	4
Guinea	97
Guinea-Bissau	45
Iraq	8
Kenya	21
Liberia	50
Mali	89
Mauritania	69
Niger	2
Nigeria	25
Senegal	25
Sierra Leone	90
Somalia	98
Sudan	87
Togo	5
Uganda	1
United Republic of Tanzania	15
Yemen	19

FGM PROCEDURES

The consequences of FGM last a lifetime. In some regions FGM is being carried out in health facilities by registered doctors and midwives

in accordance with the rules mandating the usage of sterile equipment under general or local anaesthesia, despite the fact that international organisations oppose the FGM. Hospital based procedure does not affect the incidence of short- and long-term complications; it is unethical by all means (Eke, 2000; Creighton and Hodes, 2016). In considerable number of regions, on the other hand,, anaesthetic and antiseptics are not used and the procedure may be conducted with tools like razors, knives, scissors or any sharp devices. Circumcision might be done individually or with a group of peers in the same enviroment (Momoh, 2005). During type III excision procedure (infibulation) , other women and friends hold the girl in the lithotomy position. A deep incision is carried out on both sides from the clitoris to the fourchette. The clitoris, labia majora and minora are excised. Heavy bleeding risk is very high although using some kind of poultices or approximation of the edges of the skin with thorns may control it. To perpetuate the flow of urine and menstrual blood passage, a piece of twig is located between the edges of the wound. The lower extremities are then tied together for a couple of weeks to provide haemostasis and to prevent separation of the wound egdes. (McCaffrey and Gordon, 1995). After the healing introitus looks covered with the skin except for a small hole (Momoh, 2005). The patient may resist and the incision may be uncontrolled, causing unintended extensions of the incision.

HEALTH CONCEQUENCES and COMPLICATIONS

Huge health risks of FGM are caused by especially having it done by inexperienced providers under unhealthy conditions. FGM usually results in some unique medical, gynaecological, urological, obstetric and psychological and sexual problems. And they may not reach appropriate medical care because of shortages of midwives and doctors who are well trained over the issue[6].

FGM has short term and long term complications. Short term one includes haemorrhage from the branches of the pudental artery, shock,

6 World Health Organization. (□2008)□. Eliminating female genital mutilation: an interagency statement - OHCHR, UNAIDS, UNDP, UNECA, UNESCO, UNFPA, UNHCR, UNICEF, UNIFEM, WHO. World Health Organization. https://apps.who.int/iris/handle/10665/43839 (Access Date. 5.7.2022)

pain, urinary retention and infections that can result in death (Larsen and Okonofua, 2002). Primary infections include especially staphylococcus aureus (Ivazzo et al., 2013). Human Immunodeficiency Virus (HIV), Chlamydia trachomatis, Clostridium tetani, herpes simplex virus type-2 infections are also ‑encountered especially in patients with infibulation (Ivazzo et al., 2013). Long term concequences are cysts and abscesses, scar formation, damage to the urethra resulting in urinary incontinence, recurrent urinary tract infections, dyspareunia, neuromata resulting from trapped clitoral nerve, haematocolpos and sexual dysfunction like dyspareunia (Toubia, 1994; Lightfoot-Klein, 1989). Psychological complications comprise fear, anxiety, flashbacks, phobia and depression (Oyefara, 2014). Besides, in type III patients, during vaginal delivery it may be necessary to perform incision for deinfibulation or perineal tear may occur without deinfibulation which may cause new complications (Rushwan, 2000).

Generally women do not take the FGM as responsible for the difficulties they experience since they are educated that pain is the prerequisite of growing and is therefore normal. From their point of view cultural issues are very important over FGM (Cameron, Rawlings-Anderson, 2001). Women with various types of FGM, can suffer from pelvic floor symptoms responsible for distress and impact on their daily life (Binkova, 2021).

FGM patients mostly experience some sort of sexual dysfunctioon especially persistent, recurrent problems with sexual response, desire, orgasm or pain. Orgasms are generally weak, infrequent or hard to reach. Reduced desire may ocur because of pain or as a posttraumatic stress. Infibulation patients significantly experience hard times during intercourse since this type of FGM has a property of a kind of physical barrier to penetration, conception and childbirth and, eventually, causes marital conflict[7]. In some cases sexual intercourse can be possible through the small opening left after infibulation that causes severe pain and infertility. This may require gradual dilation before intercourse. Besides, deinfibulation may be necessary to allow intercourse or childbirth.

7 Donohoe, M. (2006). Female Genital Cutting: Epidemiology, Consequences, and Female Empowerment, http://www.medscape.com/viewarticle/546497. (Access Date. 1.4.2022)

JUSTIFICATIONS FOR FGM

FGM is being performed for many sociocultural reasons, differing from one region and group to another. The significant reason is that it is part of the history and cultural tradition of the community. In many areas, it is considered as a rite of passage to adulthood and is also practiced so as to fullfil a sense of ethnic and gender identity in the community (Momoh, 2010). Social acceptance is a leading reason for perpetuating the practice as usual. Besides, protecting virginity before marriage, keeping marriageability high (increasing a girl's probobility of finding a spouse), establishing faithfulness after marriage, protecting from rape, allowing a source of income for circumcisers, as well as sense of cleanliness and beauty are all regarded as the reasons of the practice (Rahman and Tobia, 2000). Some communities accept the procedure as a religious requirement, although it is not written in the religious books such as the Koran or the Bible.

With not being clear, first practicing of FGM has dated back to the fifth century BC (Koso-Thomas, 1987). It is thought that it was carried out in ancient Egypt as a token of difference among the aristocracy. Some propose it began during the slavery era when black slave women were seen in ancient Arab communities. Some think FGM began to develop among some sub-Saharan ethnic groups as rituals. It was thought that before marriage FGM would protect virginity by reducing sexual desire. It does not seem that the practice is confined to Africa. The early Roman implementation of putting rings through the labia majora of their slaves with the aim of preventing pregnancy is an apparent sign of the fact that the FGM has been performed outside Africa (Bridgehouse, 1992). Russia Scoptsi sect carried out FGM to protect virginity as well (Eke, 2000). In the United Kingdom and the United States, we know that FGM was conducted during the nineteenth century by doctors to heal allegedly female weaknesses like having hard times reaching orgasm, insanity, masturbation, hysteria. It is notable to accept that parents do not decide to circumcise their daughters with bad intent, but concider it as an act of love and part of their culture. FGM is accepted as an act of love to be celebrated with ritual events with enthusiasm. It is seen as a passage to adulthood establishing and protecting virginity and marriage

worthiness. In FGM practicing societies it is believed that if a girl is not cut she can not be an adult and dos not have the right to marry so they let their ancestors down. Being not accepted by their family and tribe members can cause lack of social networks. Therefore ones circumcised are highly regarded in their communities. This is seen especially within societies which are patriarchal and economically deprived and where women experience limited education.

In some areas it is believed that FGM keeps vagina clean, but there is no evidence for this suggestion. Some think that FGM is a religious obligation and that it is a prerequisite to be a good Muslim or Christian. But it is revealed that FGM has no link to religion. Moreover, the Islamic Sharia Council, the Muslim College and the Muslim Council of Britain (MCB) have condemned the procedure of FGM, noting that it is not a requirement of Islam. Many countries take FGM as an accepted part of their custom and a fact of life for the girls (Momoh, 2005). Due to this social power and hierarchy, most women do not question FGM. The elders within the tribe structure regard FGM as a highly beneficial practice and as part of the cultural heritage. These older women, especially ones from the paternal generation show strict stance and pass on cultural norms from one generation to the next. For older women to acknowledge that FGM is a malicious practice means having to psychologically admit the fact that their elders did something harmful to them.

However a recent trend has been implemented that women under19 years old are less likely to face with FGM than women in older age groups[8]. This fact can be taken as a sign of a probable change in the cultural practice. In the contemporary world, thanks to the education, more women are opposed to FGM and more people are aware of the health consequences of FGM. Although there is a desire not to want the practice, there is social pressure for girls to be circumcised[9].

8 UNFPA, UNHCR, UNICEF, UNIFEM, WHO, FIGO, ICN, MWIA, WCPA, WMA. (2010). Global strategy to prevent health-care providers from performing female genital mutilation. http://www.who.int/reproductivehealth/publications/fgm/rhr_10_9/en. (Access Date. 1.7.2022)

9 UNICEF. (2013) Female Genital Mutilation/Cutting: A Statistical Overview and Exploration of the Dynamics of Change. New York: UNICEF. http://data.unicef.org/wp-content/uploads/2015/12/
FGM_Report_Summary_English__23August_hi-res_94.pdf (Access Date. 4.7.2022)

PREVENTING FGM

In the last few decades the world has started to take action in preventing the FGM procedure since it has many health consequencies and is against the human rights. In 2008 WHO stated to support leaving the FGM practice[10]. In this statement there is data reviewed over a time course to support the harmfullness of the FGM. It stated the increased recognition of the human rights and legal aspects of the issue and provided information on the frequency of FGM. It also summarised research about why FGM continues, how to stop it and its damaging effects on the health of women, girls and newborn babies.

In 2010 WHO published the 'Global Strategy to Stop Health-Care Providers from Performing Female Genital Mutilation' with the help of other UN agencies and international organisations[11]. In December 2012, the UN General Assembly decided to resolve the problem to eliminate FGM[12]. This is an important breakthrough to eliminate FGM and an important step in carrying through cultural change. For whatever reason, FGM causes a unjustified inequality between the two sexes. For this reason, efforts to prevent and eradicate FGM worldwide must go on.

Midwives have an important role in identifying FGM and providing adequate care to FGM victims. During pregnancy and childbirth FGM management includes appropriate services to women. Midwife should be in interaction with the woman and inform her about the complications of FGM. Besides, the Royal College of Obstetricians and Gynaecologists advises doctors not to encourage or perform FGM as an indication for caesarean section (Paliwal et al., 2014).

10 World Health Organization. (□2008)□. Eliminating female genital mutilation: an interagency statement - OHCHR, UNAIDS, UNDP, UNECA, UNESCO, UNFPA, UNHCR, UNICEF, UNIFEM, WHO. World Health Organization. https://apps.who.int/iris/handle/10665/43839 (Access Date. 5.7.2022)

11 UNFPA, UNHCR, UNICEF, UNIFEM, WHO, FIGO, ICN, MWIA, WCPA, WMA. (2010) Global strategy to prevent health-care providers from performing female genital mutilation. http://www.who.int/reproductivehealth/publications/fgm/rhr_10_9/en. (Access Date. 1.7.2022)

12 United Nations. (2012) Resolution A/RES/67/146: Intensifying global efforts for the elimination of female genital mutilations. http://research.un.org/en/docs/ga/quick/regular/67 (Access Date. 4.7.2022)

CONCLUSION

FGM is accepted as a cultural procedure and a violation of human rights, and it is still being carried out despite the advices against it. FGM has no benefit in all aspects for women and girls. Midwives have to get knowledge of FGM in order to help the victims. It is important that more efforts should be made to change the traditional cultural views to prevent violence against females with the aim of to eliminate FGM. Midwives can improve the lives of women and girls compromised by FGM. They should provide appropriate care for women who have experienced FGM. Midwives should reach out to the victims and refer them to the adequate services. International orginisations should develope more fighting programmes against the FGM. In order to reduce and finally to end the practice, every single woman and man should be educated about the practice and its consequencies.

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EXAMINATION OF TUBERCULOSIS DISEASE WITH THE DIMENSION OF VULNERABLE GROUP IMMIGRANTS

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Abstract: Every year, millions of people in the world leave their country for various reasons and are forced or forced to migrate. Migration includes social, economic and health-related risks together. Forced immigrants form disadvantaged groups in the countries they go to, and they try to survive by working in unskilled and unhealthy environmental conditions, insecure dangerous areas where local individuals do not want to work, due to communication barriers, the situations brought by being a migrant. Diseases that have not been seen before or health problems that are no longer seen in the regions where they go with the migration increase with the individuals coming from different societies. Deterioration in nutritional habits, dehydration, typhoid fever, polio, influenza, food poisoning, hepatitis A, measles, malaria, lice, fleas, vitamin D deficiency, sexually transmitted diseases, cancer, diabetes, hypertension, alcohol addiction, substance abuse due to insufficient screening. addiction, mental health problems, violence, premature deaths and increased maternal mortality can be counted as long-term health problems. There are many factors that cause people to leave their lands and migrate to other countries. Natural, social, political and economic reasons are among the main reasons for migration. The change in living conditions as a result of people's voluntary or involuntary displacement and the increase in exposure to infectious diseases due to many environmental factors increase the incidence of the disease, especially in

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immigrants from vulnerable groups, and the societies where infected individuals take shelter. In our study, tuberculosis disease transmitted by respiratory tract, factors affecting transmission, risky situations for infection, signs, symptoms and diagnostic methods of the disease, control of the disease in the community and measures for prevention are discussed from the perspective of Public Health Physicians and Nurses.

Keywords: Immigrants, Tuberculosis, Tuberculosis In Fragile Groups

INTRODUCTION

Despite the health policies carried out around the world and many successes, tuberculosis is still a global public health problem. The "Termination Strategy for Tuberculosis" is carried out by the World Health Organization. In the light of current international developments in Türkiye, disease prevention, follow-up and treatment are offered free of charge within the scope of the "National Tuberculosis Control Program" (General Directorate of Public Health, GDPH, 2019).

Barriers to the prevention of infectious diseases in the globalizing world; The climate changes experienced, economic crises, epidemics, wars, migrations, inequalities in income distribution and the resulting domestic and international displacement bring together causes such as poverty, inadequate and unbalanced nutrition, and working in precarious and harsh conditions (Meng at al. ., 2015; Gökçay and Çevirme, 2022).

Every year, millions of people in the world leave their country for various reasons and are forced or forced to migrate. Migration includes social, economic and health-related risks together. Compulsory immigrants form disadvantaged groups in the countries they go to, and they try to survive by working in unskilled and unhealthy environmental conditions due to communication barriers, the situations brought about by being a migrant, and working in insecure, dangerous areas where local individuals do not want to work (Korkmaz and Avcı, 2022; Gushulak et al., 2010; Farley et al., 2005). According to the 2019 data of the Turkish Statistical Institute (TUIK), 677 thousand 42 people migrated to Türkiye from abroad. According to the 2018 World Migration Report, 257.7 million people migrated from their lands.[4]

4 https://data.tuik.gov.tr/Search/Search?text=göç (22.12.2022)

It is known that migration creates long-term health problems on individuals. Deterioration in eating habits, dehydration, typhoid fever, polio, influenza, food poisoning, hepatitis A, measles, malaria, lice, fleas, vitamin D deficiency, sexually transmitted diseases, cancer due to insufficient screening, diabetes, hypertension, alcohol addiction, substance abuse , mental health problems, violence, premature deaths and increase in maternal mortality rate can be counted as long-term health problems (Hansen et al., 2016).

Diseases that have not been seen before or health problems that are no longer seen in the migrated regions with migration increase again with individuals from different societies, environmental health problems cause negative developments with the accompanying inadequacy of record keeping and notification in the health system (Hansen et al., 2016).

The increase in the number of international migrants has increased strongly over the past two decades, from 173 million in 2000 and 221 million in 2010 to 281 million people living outside their country of origin in 2020. Currently, international migrants represent approximately 3.6 percent of the world's population.[5] In Türkiye, on May 18, 2022, in the statement made by the General Directorate of Immigration Administration, Harmonization and Communication, it was stated that there are 5 million 506 thousand 304 refugees and international migrants in Türkiye, including Syrians under temporary protection (Refugees Association, 2022).[6] According to the data of the Ministry of Interior General Directorate of Migration Management, 3.6 million Syrian nationals are registered in Türkiye under "temporary protection".[7] In addition, there are approximately 400,000 conditional refugees registered with the United Nations High Commissioner for Refugees. Most of this number is composed of those coming from Afghanistan and Iraq. However, according to the General Directorate of Migration Management, the number of people coming to Türkiye for education, work, tourism or family relatives is 1.1 million (Mardin et al., 2020; Tunç et al., 2022).

5 https://www.un.org/en/desa/international-migration-2020-highlights (23.12.2022)
6 https://multeciler.org.tr/ (20.12.2022)
7 https://www.goc.gov.tr/gecici-korumamiz-altindaki-suriyeliler (20.12.2022)

CAUSES of MIGRATION

• **Natural Causes**

- Unfavorable climatic conditions (drought, very hot, very cold)

-Natural disasters (earthquakes, floods, erosion)

- Insufficient or inefficient agricultural lands

• **Social Reasons**

They are migrations arising from individual needs.

-In order to get away from social, cultural and social conflicts,

- Utilizing health services and educational needs

-Improvement of living conditions

To be able to live free of religious beliefs

•**Economic Reasons**

In the country of residence;

-Poverty

-Inequality in income distribution

- Inadequate employment

-Rapid population growth

• **Political Reasons**

-International border exchange movements

-Terrorism and anashia

-Internal and external conflicts and wars

Risky Groups in Migration;

- The elderly

- Baby and children

- Pregnant and postpartum women

- Those with chronic health problems

- Disabled people

- Those with communication problems (Avcı, 2022; Aktürk, 2020)

Migrant individuals, in the jobs they enter in order to hold on to life; The prevalence of infectious diseases, pneumonia and tuberculosis is

high due to busy working hours, lack of physical infrastructure and lack of hygiene in the areas where they live. In addition, in migrant workers; Along with mental problems such as depression and anxiety, the incidence of cardiological, respiratory, gastrointestinal system, respiratory system diseases, diabetes, peptic ulcer and allergic diseases increases (Morris et al., 2009; Hovey et al., 2007).

TUBERCULOSIS DISEASE

Discovered by Robert Koch in 1882, tuberculosis is one of humanity's oldest diseases. Tuberculosis (TB) disease is a respiratory system disease caused by Mycobacterium tuberculosis complex bacteria. Tuberculosis, which was an important health problem for many reasons at the beginning of the 20th century; It has been one of the leading infectious diseases that cause death all over the world due to the unknown treatment, not isolating the patients, and deterioration of the quality of life. Although tuberculosis is a treatable disease; In case of non-compliance with the treatment process or inability to start the treatment, 50% of the patients die within five years (Kara and Aslan, 2021). According to the World Health Organization (WHO) data, approximately 9.9 million people worldwide were diagnosed with tuberculosis in 2021.

Regions where TB is most common; poverty and inequality in income distribution are intense; African and Asian countries. China, India, South Africa, Philippines, Nigeria, Pakistan are the countries where 64% of new tuberculosis cases are seen. In South Africa, it is known that 58% of individuals with high TB burden from human immunodeficiency virus (HIV) and TB are infected with HIV. In the Turkish Tuberculosis Control Report, the total number of tuberculosis cases in Türkiye was 11,786, and the incidence of tuberculosis was found to be 14.1% per hundred thousand. (Erat et al., 2022; GDPH, 2019; Churchyard et al., 2014). While the prevalence of tubercle in the world is around 10% (chart 1); The prevalence of TB, which has been decreasing since 2005 in Türkiye (chart 2), has increased to 18% in 2021.[8]

8 https://worldhealthorg.shinyapps.io/tb_profiles/?_inputs_&entity_type=%22country%22&lan=%22EN%22&iso2=%22TR%22 (20.12.2022)

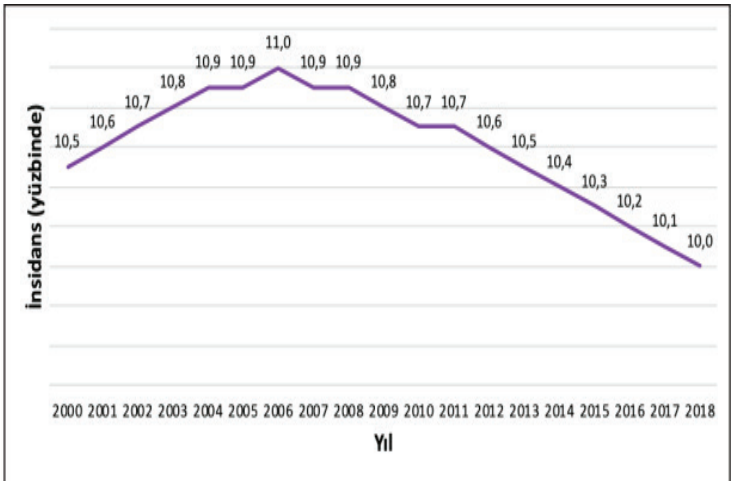
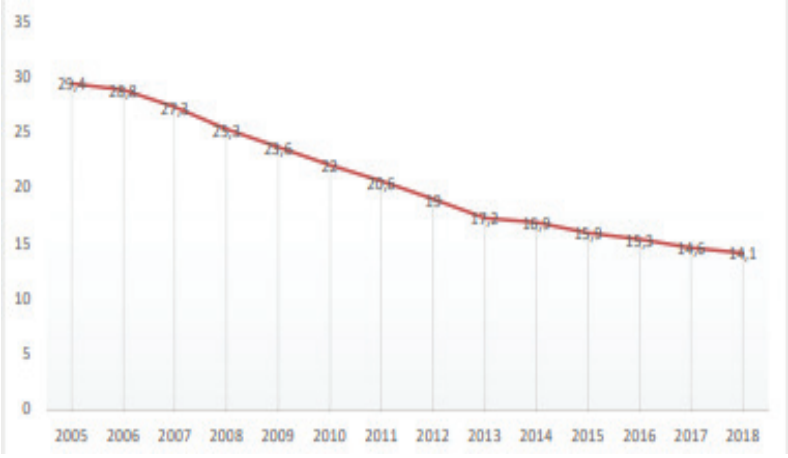


Chart 1: Incidence of Tuberculosis in the World (Kara and Aslan, 2021)



Graph 2: Incidence of Tuberculosis in Türkiye (Aktaş et al., 2022)

PATHOGENESIS

Patients with ASD residence (ARB) positive laryngeal tuberculosis and pulmonary tuberculosis on sputum microscopy; smear negative TB patients are more contagious than they are contagious.

droplets of saliva emitted during sneezing, sneezing, and speech of individuals with active pulmonary tuberculosis or laryngeal tuberculosis lose fluid within minutes, reducing to a size of 1-5 microns, and these droplets contain 1-3 bacilli. Respiratory bacilli reach the alveoli; The course of the disease varies according to the individual's immune system, virulence and number of bacilli.

In immunized individuals, contact with bacillus prevents the formation of infection with a restrictive and severe response in the lung.

While healing is achieved with limited accidental necrosis and calcification; In non-immune individuals, inflammation similar to acute bacterial and lobar pneumonia occurs with bacilli that settle in the alveoli (Görak et al., 2018).

Factors Affecting Transmission of Tuberculosis Bacilli:

According to the Source Patient;

- ✓ Tuberculosis of the bronchi, lung or larynx is contagious.
- ✓ Smear positivity, that is, the high number of Bacile in sputum is a factor that increases the contagiousness.
- ✓ The severity and amount of cough is high,
- ✓ Aerosol-generating medical procedures (sputum extraction, bronchoscopy, etc.)
- ✓ Pathogenicity of the virus, resistance to drug therapy are known as factors that increase transmission (Aktürk, 2019; Görak et al., 2018).

Environmental Factors;

- ✓ Being close to the disease agent,
- ✓ Insufficient ventilation of the environment,
- ✓ The fact that the ventilation of the patient's environment does not have negative pressure or that the air is returned without applying UV rays increases the Basri spread; Sunlight reduces the UV light bacillus spread and the number of viable bacillus (GDPH, 2019)

According to the Target Individual;

- ✓ Acquired resistance to bacillus (vaccination, previous disease or preventive treatment reduces transmission.)
- ✓ Factors that increase contamination and accompanying diseases increase infection with bacteria.

Factors of Infection;

Pathogenicity: It is the ability of the infectious agent to cause disease in the human body. Microorganisms are classified as pathogens and non-pathogens (saprophytes). Saprophytes are known as organisms that do not cause disease in nature, but they can become pathogenic when taken into the body by any means (Altay et al., 2021).

Infectivity: It is the ability of the disease agent to settle in tissues or organs in an intact individual.

Virulence: The power to cause disease in the body where the disease agent is located is called virulence.

Invasion-spread: It is the state of invasion of the pathogenic microorganism from the tissue or organ in which it is located, to another tissue or organ. Microorganisms with a high rate of spread also increase the risk of infection.

Toxigenicity: It is the production of toxin in the tissue or organ of the microorganism, or the release of toxin when it is broken down. While some pathogens secrete toxic substances (diphtheria, tetanus); When some microorganisms are decomposed, toxin is released into the environment (Dolgun vd., 2020, Altay et al., 2021).

Tropism: It is the settlement of certain microorganisms in certain organs or tissues, regardless of which way they enter the body. For example; As the tuberculosis bacillus settles in the lungs, the hepatitis virus causes inflammation in the liver.

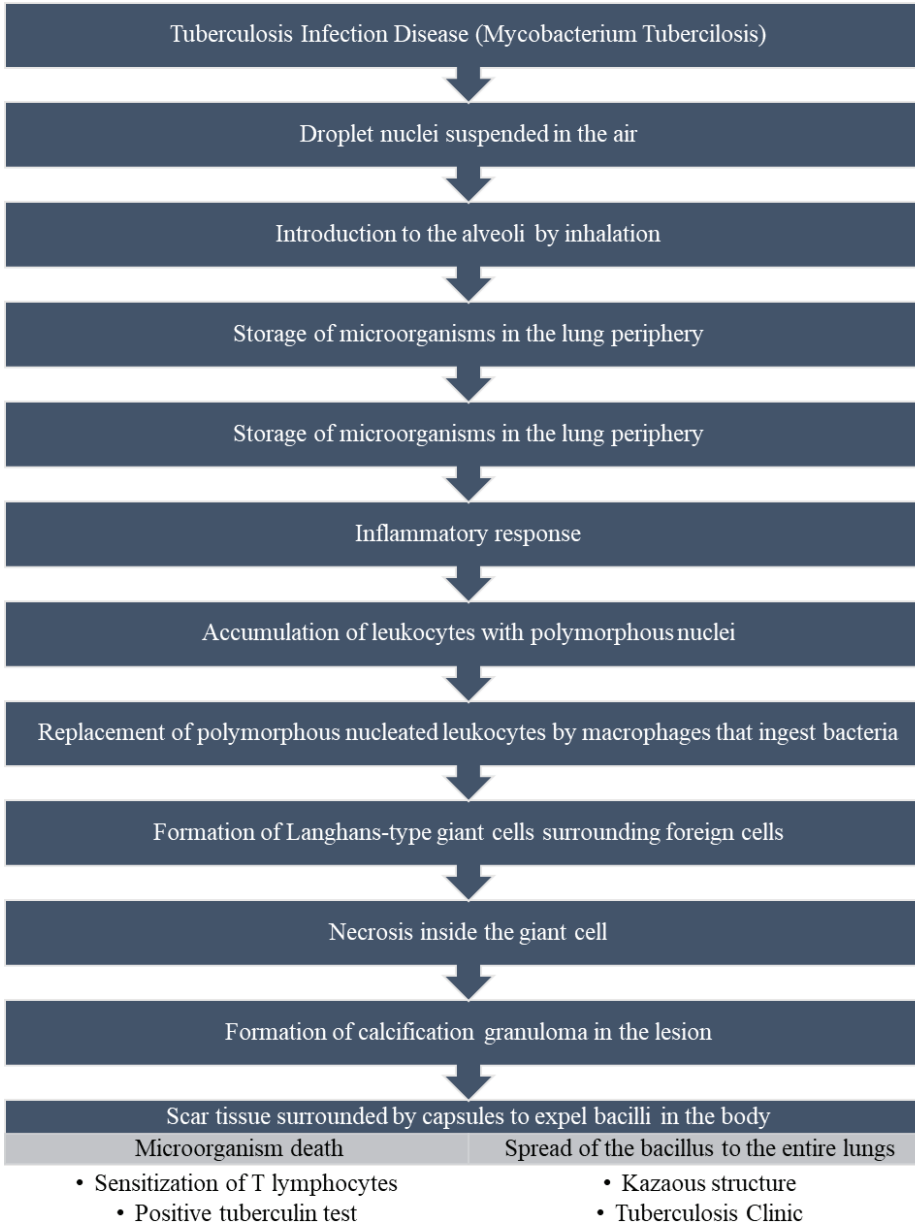


Figure 1. Tuberculosis Formation (Görak, 2019)

Risky Situations for Tuberculosis Infection;

- ✓ Children under the age of five,
- ✓ Immigrants, individuals with low socio-economic income,
- ✓ Those living in an area with a high incidence of TB,
- ✓ Immunodeficiency states with chronic kidney failure,
- ✓ HIV(+) individuals,
- ✓ Those with a history of smoking or substance use,
- ✓ Individuals who have encountered TB bacillus in a short time (2 years)
- ✓ Diseases affecting lymphoid organs,
- ✓ Those with a history of lung parenchymal disease such as silicosis
- ✓ Those receiving treatment that suppresses the immune system,
- ✓ Presence of fibrotic findings on radiological imaging (Altay et al., 2021; Lewinsohn et al., 2017; Yin et al., 2013).

SYMPTOMS

Symptoms Related to the Respiratory System:

- ✓ Cough lasting two weeks or more, hemoptysis
- ✓ Pain alternating with back, chest and breathing,
- ✓ Hoarseness (especially when larynx is involved)
- ✓ Difficulty in breathing (in cases where there is an increase in pleural fluid or lesions are common),

General Signs and Symptoms:

- ✓ Anorexia and weight loss
- ✓ Fire,
- ✓ Night sweats,
- ✓ Weakness,
- ✓ Cough

While pulmonary tuberculosis should be suspected in patients with one or more of the above-mentioned signs and symptoms,

symptoms may not be seen in some TB patients (Nightingale et al., 2022; Erci, 2020; GDPH, 2109; Dowy et al., 2013).

METHODS USED in DIAGNOSIS of LUNG TUBERCULOSIS

- ✓ Physical examination
- ✓ Radiological examination
- ✓ Microbiological examination
  1. ARB image on sputum smear
  2. M. tuberculosis colonies in culture
  3. M. Tuberculosis growth in liquid culture
- ✓ Serological examination
- ✓ Tuberculin skin test and Interferon Gamma Release Tests (IGST)
- ✓ Cell counting, Biochemical tests
- ✓ Histopathological examination (Leone et al., 2010).

TUBERCULOSIS TREATMENT PRINCIPLES

- ✓ Patients have to take long-term drug therapy.
- ✓ In order to prevent the development of drug-resistant bacilli, it is necessary to pay attention to the combination of treatments.
- ✓ The way of using the drugs in the treatment should be every day and absolutely on an empty stomach.
- ✓ It is recommended that the patient be in contact with the institution where he/she is treated in order to control his/her drug use status.
- ✓ Bactericidal drugs should be used, in case of replacement, more than one drug should be used (Avcı, 2016). The treatment protocol for active tuberculosis is presented in table 1.

Although significant progress has been made in the fight against tuberculosis, it is still the deadliest bacterial infectious disease worldwide. Every year, as many as 10 million people worldwide still die from tuberculosis. The World Health Assembly has set a goal of reducing the

number of tuberculosis deaths by 90% and the number of new infections by 80% by 2030 (Christof et al., 2022).

Table 1. Treatment Protocol For Active Tuberculosis (Görak, 2019)

Type of Treatment	Initial Treatment	Continued Treatment	Descriptions
Standard Treatment	first 2 months (everyday)	next 4 months (2 doses per week)	
No risk of drug resistance (in areas below 2% drug resistance)	Isoniazid (INH) Rifampicin (RIF) Pyrazinamide (PZA)	Isoniazid Rifampicin	If there is sensitivity to the drug, if there is resistance to the INH treated above, it is treated with other drugs for 6 months. Rifampicin resistance lasts for 12-18 months with other drugs.
Possibility of drug resistance (no drug resistance risk factor in areas greater than 2% drug resistance)	2 ay süreyle (haftada 3 doz) Isoniazid Rifampicin Pyrazinamide Ethambutol or Streptomycin	4 ay süreyle (haftada 3 doz) Isoniazid Rifampicin	16. hafta sonu (haftada 2 doz) Isoniazid Rifampicin
Multiple drug resistance In areas where resistance to multiple drugs is very high HIV infection, prior drug use and premature discontinuation	for 2 weeks (2 doses per day) Isoniazid Rifampicin Pyrazinamide Ethambutol or Streptomycin (SM)	for 6 weeks (2 doses per day) Isoniazid Rifampicin Pyrazinamide Ethambutol or Streptomycin	

Descriptions:

EMB or SM Treatment should be continued in people who are sensitive to INH or RPM.

Treatment duration is 12 months in children with miliary TB, bone and mobile TB or TB meningitis.

Children under 5 years of age who are in contact with tuberculosis or with a positive tuberculin test are treated for 6 months only with INH or for 3 months with INH + RIF combination.

PREVENTION of TUBERCULOSIS

Tuberculosis is in the group of infectious infectious diseases with high mortality. A quarter of the world's population is infected with Mycobacterium tuberculosis. It is a disease whose prevalence can be reduced with timely appropriate and effective treatment (Çevirme, 2017).

Preventing TB infection and halting disease-to-disease progression is critical to reducing TB incidence to the levels predicted by the TB End Strategy. The main health interventions to achieve this reduction are the WHO recommend TB preventative treatment for people living with HIV, household contacts of people with TB and other risk groups, prevention and control of TB infection and vaccination of children with the bacillus Calmette-Guérin (BCG) vaccine.[9] Addressing the broader determinants affecting tuberculosis outbreaks may also help prevent tuberculosis infection and disease.[10]

Another prevention is the prevention of exposure of especially risky groups with TB. Individuals at high risk of developing tuberculosis disease; People with HIV infection, people infected with TB bacteria in the past 2 years, infants and young children, people who inject illegal drugs, people with other diseases that weaken the immune system, elderly people, and those who have not been properly treated for TB in the past. The importance of preventing exposure of these groups to TB disease, especially in their international travels, is emphasized.[11]

9 https://www.who.int/teams/global-tuberculosis-programme/tb-reports/global-tuberculosis-report-2022/tb-prevention (23.12.2022)

10 https://www.cdc.gov/tb/topic/basics/vaccines.htm (20.12.2022)

11 https://www.cdc.gov/tb/topic/basics/tbprevention.htm (20.12.2022)

OBJECTIVES of TUBERCULOSIS CONTROL

- ✓ Reducing the transmission of tuberculosis and preventing the emergence of new patients
- ✓ Early diagnosis of patients, initiation of treatment and recovery, prevention of disease-related deaths
- ✓ Increasing the quality of life and ensuring the continuity of productivity
- ✓ Preventing drug resistance is the diagnosis of drug-resistant patients and preventing the transmission of resistant bacilli with appropriate treatment methods (Aygün, 2019; GDPH, 2019).

PRINCIPLES of PROTECTION FROM TUBERCULOSIS

- ✓ Individuals who are in close contact with the patient, caregivers or people who have contact must wear a HEPA filtered TB mask,
- ✓ Treating drug-resistant TB patients in hospital,
- ✓ Obligation to be in crowded environments that increase the formation of infection, correction of bad social position,
- ✓ Informing the public about TB transmission and control,
- ✓ Performing necessary diagnostic examinations of individuals who are in close contact with the patient (such as X' Ray or laboratory tests),
- ✓ Home visits by health personnel should be made and they should be encouraged to increase compliance with treatment and necessary tests,
- ✓ In some cases, preventive treatment should be provided by prescribing Isoniazid for 1 year (These conditions are those who are in close contact with active patients with a positive skin test, households with active infections, all adolescents with recent infections, those who have recovered from the disease but are in danger of a reaction, all those with a predisposition to tuberculosis. Persons)
- ✓ In societies that constitute the risk group (migration, school, etc.), screening should be done with tuberculin tests,

- ✓ In societies with a high incidence of tuberculosis, chest radiographs should be examined at regular intervals (Görak, 2019).

ACTIVITIES to be CONDUCTED BY PUBLIC HEALTH PHYSICIANS and NURSES FOR TUBERCULOSIS CONTROL ın the COMMUNITY

- ✓ TB patients and their relatives at risk of transmission; It should be ensured that the spread of the disease in the community should be prevented by providing education on the disease, isolation, treatment process, drugs and their side effects,
- ✓ It should be ensured that the compliance of TB patients with treatment is monitored and necessary measures are taken regarding non-compliant patients,
- ✓ Preventing the spread of the disease by screening individuals infected with bacillus, contacts, and groups with a high risk of developing TB,
- ✓ Providing immunity with BCG (Bacillus Calmette-Guerin) vaccine in childhood,
- ✓ Developing measures to prevent TB transmission in institutions,
- ✓ To handle TB and TB control adequately in the education processes of all healthcare professionals,
- ✓ Emphasizing the importance of disease prevention and immunization by conducting education and awareness-raising activities for all groups at the social level,
- ✓ Providing economic and social assistance to TB patients and their families, providing support for individuals to access relevant non-governmental organizations, preventing the disruption of treatment due to financial inadequacies and preventing exposure to the devastating effects of the disease,
- ✓ Ensuring the access and continuity of health services for individuals in vulnerable groups at risk for TB,
- ✓ Supporting the efforts of families in the vulnerable group to maintain their lives and the development of coping skills

- ✓ Providing quality health care services by respecting the cultural structure by developing an unbiased, impartial and ethical approach to vulnerable groups is important in order to prevent and control the spread of the disease in the society at all groups level (Aktürk, 2020; Tan et al., 2020; GDPH, 2019; Görak et al., 2019).

CONCLUSION

In the global world, it is inevitable that people who migrate and meet immigration are exposed to infectious disease factors for various reasons. Prevention and early diagnosis of tuberculosis disease, which can be treated internationally in the 21st century, in risky and vulnerable groups in our country, supporting the follow-up and treatment process primarily with government policies, then with ethical approach of health professionals, and effective implementation of preventive health services for the prevention of the disease, It is very important in terms of preventing health problems and deaths that may occur in the social dimension.

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NONINVASIVE PRENATAL TESTING (NIPT) FOR DETECTING COMMON CHROMOSOME ANEUPLOIDIES AND BEYOND

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Abstract: Cell-free DNA (cfDNA) consists of small fragments of extracellular DNA in peripheral blood resulting from dynamic cell turnover leading to continuous remodeling. Technological advances in molecular genetics are enabling scientists to use this genetic material for a new era of blood testing to detect disease, monitor patients, and conduct medical research. In obstetrics, sequence analysis of cfDNA fragments in maternal peripheral blood, commonly referred to as noninvasive prenatal testing (NIPT), can be performed for prenatal detection of common aneuploidies, some sex chromosome aneuploidies, and some subchromosomal anomalies, although it is still under research. Circulating cfDNA originates from both the mother and the fetus (placenta) and is completely removed from the maternal circulation soon after birth. To obtain a reliable NIPT result, maternal plasma must contain an adequate fetal fraction (FF), a key parameter that ensures adequate representation of fetal chromosomes, which can be influenced by several factors. For common aneuploidies, including trisomy 21, 18, and 13, NIPT is the most sensitive and specific screening test available. Systematic reviews have reported a wide range of NIPT failure rates. At this point, there is no strict standard strategy in case of test failure, but retesting, serum marker screening, targeted ultrasound screening, or invasive diagnostic testing are the options. NIPT is commonly used as a secondary screening test in pregnant women who have been found to be at high risk for aneuploidy on combined serum

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or ultrasound screening tests in the first or second trimester, who are ≥35 years of age at delivery, who have a family history of aneuploidy, who have an indication for but do not prefer invasive diagnostic testing, or in couples carrying a Robertson translocation. Nowadays, NIPT is increasingly used as a primary screening tool for the detection of fetal aneuploidy. Couples should be well informed and accept the following: NIPT is an optional procedure, not a necessity; there are other prenatal screening methods and invasive diagnostic tests; NIPT cannot elucidate all genetic defects and is limited in its ability to detect some aneuploidies; it can be very expensive, especially for those without insurance coverage; and its performance may decrease in some groups of women such as overweight pregnant women and multiple pregnancies. All pregnant women with positive screening results should be offered further invasive procedures such as amniocentesis, chorionic villus sampling (CVS), and diagnostic tests such as karyotyping or chromosomal microarray (CMA) to confirm the NIPT. Pregnant women with "no-call" test results may undergo either a repeat NIPT, an alternative prenatal screening method such as serum screening and/or ultrasound screening, or an invasive diagnostic procedure. The woman whose screening is negative should be informed that her fetus is at low risk for one of the aneuploidies in the test panel, but that this possibility cannot be completely ruled out based on the test result and that diagnostic testing should be performed if fetal abnormalities or malformations are detected on subsequent ultrasound examination.

Keywords: Cell-Free DNA, Noninvasive Prenatal Testing (NIPT), Positive Predictive Value, Prenatal Diagnosis, Prenatal Screening

INTRODUCTION

Cell-free DNA (cfDNA) consists of small fragments of extracellular DNA that are released from cells into the bloodstream and biofluids as a result of dynamic cell turnover leading to continuous remodeling. Technological advances in molecular genetics allow the scientists to utilize this genetic material for a new era of blood tests to detect disease, monitor patients, and conduct medical research. In obstetrics, cfDNA testing can be performed for noninvasive prenatal detection of common aneuploidies such as trisomy 21 (Down syndrome), trisomy 18 (Edwards syndrome), trisomy 13 (Patau syndrome), and some sex chromosome

aneuploidies based on sequence analysis of cfDNA fragments in maternal peripheral blood. In recent decades, there has been a growing desire by both couples expecting a baby and health care providers to improve coverage and diagnostic accuracy while reducing the cost of noninvasive prenatal diagnostics. The presence and persistence of fetal cells in maternal tissues, also known as fetal microchimerism was first described in 1893 by the detection of trophoblasts in the lungs of women who died of eclampsia (Lapaire, 2007). This study demonstrated that trophoblasts find their way into the lungs via the maternal circulation. Since this classic paper was published in German, and in a desire to reach a wider audience and reevaluate the conclusions, another paper was published in English in 2007, confirming the results not only in women with eclampsia, but also in non-complicated pregnancies (Lapaire et al., 2007). Significant developments in sequencing of cfDNA technology, whose roots were laid in the late 1800s, occurred through the detection of significant amounts of male cells in the blood of pregnant women carrying male fetuses (Walknowska et al., 1969). Since the first use of cfDNA for fetal sex determination and after the introduction of these tests, widely known as "noninvasive prenatal screening" (NIPS) or "noninvasive prenatal testing" (NIPT) into clinical practice in 2011 as a novel screening option for the detection of aneuploidy with very high sensitivity and specificity for trisomies 21, 18, and 13, significant advances have occurred in recent years, making these tests an integral part of prenatal screening (Devaney et al., 2011; Norton et al., 2012; Palomaki et al., 2012; Palomaki et al., 2011). In this article, the term ''NIPT'' was preferred for these tests, which is considered more popular than ''NIPS''. While NIPT has the potential to replace invasive diagnostic tests for common chromosome conditions, its screening performance for rare genetic diseases, subchromosomal microdeletions and duplications is not yet satisfactory.

CELL-FREE DNA

Cell-free DNA are small fragments of extracellular DNA. These fragments in the maternal bloodstream originate from both the mother and the fetus (fetal-placental unit). The main source of fetal cfDNA in the maternal circulation, commonly referred to as "fetal" but actually "pla-

cental" cfDNA, is thought to be apoptotic syncytiotrophoblasts, whereas maternal cfDNA is mainly derived from apoptosis of maternal hematopoietic cells (Lui et al., 2002; Sekizawa et al., 2000; Tjoa et al., 2006). DNA fragments released from fetal erythroblasts undergoing apoptosis and transferred across the placenta into the maternal blood contribute to the remainder of the fetal cfDNA (Lo et al., 1996; Sekizawa et al., 2000; Zhong et al., 2002). After fertilization, the blastocyst develops into the embryo and placenta, so the genetic characteristics of the placenta and fetus are mostly identical, but some genetic differences between the two contribute to the discordant test results (e.g., false positive results due to confined placental mosaicism). The concentration of circulating cfDNA increases steadily as the week of gestation progresses and is removed from the maternal circulation soon after delivery, usually within two hours. (Birch et al., 2005; Lo et al., 1999; Lo et al., 1997). Since circulating fetal cfDNA from previous pregnancies does not persist, the current fetal cfDNA in maternal blood belongs to the current pregnancy. The fetal fraction (FF) is the proportion of cfDNA derived from the fetal-placental unit in the total maternal cfDNA floating in maternal plasma. Fetal (fetal-placental) cfDNA can be detected in maternal blood as early as 5 weeks gestation, but reliable results for aneuploidy screening can be obtained from 10 weeks gestation, the time at which the FF is almost always detectable (Guibert et al., 2003). FF increases at a rate of 0.1% per week of gestation from 10 to about 20 weeks and then by 1% per week until the end of pregnancy (Wang et al., 2013). Between 10 and 20 weeks of gestation, the most commonly offered time for NIPT, FF is about 10-15% (Ashoor et al., 2012; Palomaki et al., 2012). FF may account for up to 50% of total cfDNA in maternal plasma just before the birth of a full-term fetus (Lo et al., 1998). Higher levels of FF are associated with more reliable test results because it is less difficult to distinguish fetal cfDNA from maternal cfDNA. Many NIPT companies using different NIPT methods use a FF cut-off value of 2-4%, as the detection rate is 62.1% when FF is 4% and reaches 100% when FF is more than 9% (Fiorentino et al., 2016; Guy et al., 2021; Wright et al., 2015). Therefore, in case of FF lower than 4%, it is preferable to report the test as "failed" ("no call" or "no result") to eliminate the risk of lower reliability (Canick et al., 2013). On the other hand,

a low FF may be associated with a higher risk of aneuploidy, with risk rates ranging from 2.7 to 23.3% (Norton et al., 2015; Palomaki et al., 2015; Pergament et al., 2014). For each positive specimen, a "mosaicism ratio" was calculated by dividing the FF affected by aneuploidy by the total FF, and if the ratio is less than 0.7, this may indicate mosaicism (Pertile et al., 2017; Rafalko et al., 2021). In cases with a lower FF, the detection rate of mosaicism may be reduced for both trisomy 21 and trisomy 18 (Mao et al., 2014). However, higher levels of FF are not always good news; in particular, abnormally elevated levels may indicate adverse pregnancy complications such as spontaneous preterm birth and placental invasion abnormalities (Dugoff et al., 2016; Wertaschnigg et al., 2020). Any factor that can influence the contribution of maternal or fetal-placental circulating cfDNA can affect FF. These factors may manifest either in an increase in maternal cfDNA ratio or in a decrease in fetal FF.

Main factors that affect FF:

1. Suboptimal biological sampling and transport: To minimize maternal cellular disruption and thus effectively prevent dilution of fetal cfDNA by maternal genomic DNA, and to stabilize fragmented cfDNA, the blood sample should be collected in a tube containing ethylenediaminetetraacetic acid (EDTA) and centrifuged within six hours and stored at -80°C in the freezer if the sample is not to be analyzed immediately. Alternatively, a special cfDNA collection tubes can be used, which consist of a preservation buffer that stabilizes the sample and prevents the maternal blood cells from being exposed to changing temperatures for up to two weeks. Besides, a sufficient volume of blood sample is required, as small volumes may lead to a higher risk of test failure due to insufficient plasma volume for fetal cfDNA determination.

2. Laboratory failure and technical problems

3. Early gestational age: As mentioned above, FF is lower before the 10^{th} weeks of pregnancy.

4. Maternal obesity: As maternal body mass index (BMI) increases, FF tends to decrease, both because of the relatively constant amount of fetal cfDNA in the expanded maternal plasma volume of pregnant women with obesity and because of an increase in the maternal fraction

with increasing maternal BMI (Canick et al., 2013). The increase in maternal fraction in obese pregnant women may be due to chronic inflammation and associated cell death associated with obesity (Haghiac et al., 2012).

5. Fetal Karyotype: Because fetuses with trisomy 21 have a larger placental volume than euploid fetuses, FF is higher in fetuses with trisomy 21. On the contrary, in some aneuploidies such as trisomy 13, trisomy 18, and monosomy X, the volume of the placental mass is smaller, resulting in a low FF. Furthermore, triploid fetuses generally have extremely low FF typically below 4% (Gil et al., 2017; Nicolaides et al., 2014; Palomaki et al., 2015).

6. Other factors: Any conditions or medications that stimulate maternal cell turnover, even if they have no effect on fetal-placental cell turnover, may result in decreased FF. Autoimmune diseases, B12 deficiency, thromboembolism, or drugs such as heparin and low molecular weight heparins that stimulate maternal cell turnover, even if they have no effect on fetal-placental cell turnover, may result in reduced FF (Bianchi, 2018; Burns et al., 2017; Grömminger et al., 2015; Nakamura et al., 2020). Pregnancies through in vitro fertilization (IVF) can be associated with a lower FF (Lee et al., 2018). Although the total amount of FF in twins is about 1.6 times higher than in singletons, the average FF for each twin is lower (Bevilacqua et al., 2015; Palomaki et al., 2021; Sarno et al., 2016).

METHODS FOR NONINVASIVE PRENATAL TESTING

Clinical screening for cfDNA is based on the concept that women carrying an aneuploid fetus should have a higher proportion of cfDNA from the corresponding aneuploid chromosome or chromosomes. The first method involves the rapid amplification provided by next-generation sequencing (NGS) to blindly sequence random fragments of both maternal and fetal cfDNA (Fan et al., 2008). These DNA fragments are then integrated into the comparative alignment with mapping to their corresponding chromosomes and the amount of each chromosome is compared to a DNA sample reference. The second method uses thousands of single nucleotide polymorphisms (SNPs) located only on the

corresponding chromosomes. In humans, SNPs are the most common type of genetic variation at a single base pair within a DNA sequence. Due to the genetic difference between the SNPs from maternal and fetal cfDNA, a deviation from the expected pattern of these SNPs can be utilized to identify women at risk for fetal aneuploidy (Dar et al., 2016). Both methods have same accuracy rates for screening for aneuploidies (Gil et al., 2017; Dar et al., 2014). According to a commercial laboratory that has brought the SNP genotyping method for NIPT into clinical use, this technique has been reported to be useful in detecting triploidy and has the potential to determine the relative fractional fetal DNA concentrations for each fetus in dizygotic twin pregnancies or in the case of a vanished dizygotic twin (Curnow et al., 2015; Nicolaides et al., 2014; Norwitz et al., 2019). On the other hand, the SNP-based method has some limitations when it comes to genetic analysis of pregnancies resulting from transplantation, egg donation, or surrogacy (Dar et al., 2014). NIPT by next-generation sequencing of cfDNA should be used for cfDNA screening in such pregnancies.

Screening Performance and Reliability

The screening performance of these tests can be expressed in terms of detection rate (DR) and false-positive rate (FPR). When a NIPT does not yield a useful result, the terms ''no result,'' ''test failure,'' or ''no call'' are used. Based on the evidence from several meta-analyses, the consensus DRs and FPRs for the most common aneuploidies were 99.5% and 0.05% for T21, 97.7% and 0.04% for T18, and 96.1% and 0.06% for T13 (Gil et al., 2015; Iwarsson et al., 2017; Mackie et al., 2017; Taylor-Phillips et al., 2016). Test failures in both aneuploid or euploid samples were not accounted for in these meta-analyses, and in some of the studies conducted for these meta-analyses, follow-up is incomplete for some pregnancies, so these studies likely overestimate actual performance. The cfDNA DRs for sex chromosomal aneuploidies are lower and the FPRs are higher than for common autosomal trisomies, as the DR and FPR for monosomy X were 90.3% and 0.23%, respectively, in one of the largest meta-analyses performed to evaluate cfDNA testing performance for sex chromosomal aneuploidies (Gil et al., 2015). For the other better known

sex aneuploidies, also known as sex chromosome trisomies 47, XXX; 47, XXY; and 47, XYY, the reported DR and FPR were 93 and 0.14%, respectively. (Hooks et al., 2014; Mazloom et al., 2013; Samango-Sprouse et al., 2013). Despite these relatively high DRs, the positive predictive value (PPV) is not always so high because it is influenced not only by the prevalence of the aneuploidy of interest in the population but also by maternal age-specific prevalence of given aneuploidy and the techniques used by laboratories. Consistent with this knowledge, PPVs were found to vary between 38-80% and 91-99% for T21, between 11-41% and 66-92% for T18, and between 5-13% and 45-71% for T13, respectively, for 20- and 40-year-old pregnant women (Carbone et al., 2020). Furthermore, the prevalence of aneuploidy increases with maternal age, whereas it decreases with gestational age, because the probability of fetal loss increases in fetuses with aneuploidy (Savva et al., 2010). The positive and negative predictive values for cfDNA screening for common trisomies reported in a recent review are listed in table 1 to show reasonable expected rates (Palomaki et al., 2017).

Table 1: Positive and Negative Predictive Values for Cell-free DNA Screening for Common Trisomies

Trisomy	General pregnant population		Pregnant women aged ≥35 years	
	PPV (%)	NPV (%)	PPV (%)	NPV (%)
21 (Down)	85	>99.9	95	>99.9
18 (Edwards)	69	>99.9	89	>99.9
13 (Patau)	33	>99.9	68	>99.9

NPV: Negative Predictive Value, PPV: Positive Predictive Value

All NPVs are quite high as >99.9% because the prevalence of these three diseases is a priori low, so a negative screening result certainly reduces the probability of the disease. These rates were confirmed in a large study where only two patients with false-negative test results out of the 100,000 pregnant women screened (Hu et al., 2016). On the other hand, there is no direct association between Turner syndrome (45X) and

increasing maternal age. Therefore, PPVs are expected to be the same in both the general pregnancy population and in pregnant women who are ≥35 years of age at delivery (Hu et al., 2016).

Main factors leading to test failure are low FF and uniparental disomy or parental consanguinity. Although a PPV of approximately 90% is reasonable for common trisomies on cfDNA screening, this still means that in 10% of pregnancies found to be screening positive will not have a truly affected fetus (Gil et al., 2015; Palomaki et al., 2017).

Main factors for false-positive cfDNA test results:

1. Confined placental mosaicism: Confined placental mosaicism (CPM) is defined as the presence of chromosomal abnormalities in extraembryonic tissue that are not present in the fetus. The cfDNA screening can give discordant results with the fetus (false positive or false negative), because the FF is mainly derived from the placenta (syncytiotrophoblasts). Confined placental mosaicism may occur in up to 1-2% of all pregnancies and is more common in trisomy 13 and monosomy X than in trisomy 18 or trisomy 21 and represents one of the main reasons for inconsistent reports between NIPT and invasive diagnostic procedures, particularly amniocentesis (Grati et al., 2015; Kalousek et al., 1991; Kalousek and Vekemans, 1996; Malvestiti et al., 2015; Schreck et al., 1990).

2. Maternal mosaicism: Maternal mosaicism can lead to mismatched results for sex chromosomal aneuploidies (SCA) on NIPT because the majority of cfDNA in the plasma of pregnant women is primarily derived from cellular apoptosis of hematopoietic cells. In addition, X-chromosome mosaicism may occur due to the advanced age of the woman. Therefore, determination of maternal karyotype would improve the accuracy of test results for SCA (Wang et al., 2014).

3. Maternal malignity: In a pregnant woman with cancer, fetal and maternal cfDNA as well as cell-free circulating tumor DNA (ctDNA) coming from cancerous cells contribute to total circulating cfDNA (Amant et al., 2015; Bianchi et al., 2015).

4. Vanishing twin: An aneuploid vanished twin with an aneuploid placenta may result in false positivity because the DNA fragments from the remaining placenta of the vanished twin are still separated even se-

veral weeks after the demise (Curnow et al., 2015). cfDNA of the demised fetus may still be present in maternal blood 8-13 weeks later if fetal death occurred in the first trimester, and up to 16 weeks if death occurred in the second trimester (Bevilacqua et al., 2020; Chen et al., 2021; Curnow et al., 2015).

5. Maternal blood transfusion: Transfusions in four weeks can lead to false positive or confounding test results, e.g., if the donor was male, the test falsely detects a male fetus that is actually female (Gregg et al., 2016).

6. Organ transplantation: Almost the same situation as in maternal blood transfusion, but the release of cfDNA from the transplant organ lasts longer than in blood transfusion, even for a lifetime (Bianchi et al., 2015).

7. Maternal copy number variants (CNVs): The proportions of genetic material on a particular chromosome are the same in all individuals of a particular organism. On the other hand, tiny structural variations in the genome such as duplications and deletions of genomic sequences can occur due to inherited or de novo CNVs. In such cases, the NIPT may give a false positive result if the extent of maternal duplication was relatively large and it occurred on a chromosome of interest (e.g., on chromosomes 21, 18, and 13) (Snyder et al., 2015; Zhou et al., 2017). Maternal chromosome duplications were reported to be related with up to 10% of false-positive NIPT results for trisomy (Snyder et al., 2015). Confirmatory maternal DNA sequencing may be used if the NIPT method used indicates a high risk of maternal CNV, thereby avoiding unnecessary invasive diagnostic methods (Zhou et al., 2017).

8. Technical issues: All laboratory test methods have rare technical problems that can lead to false positive or false negative test results.

Main factors for false-negative cfDNA test results:

1. Confined placental mosaicism (CPM): As mentioned above, the cfDNA screening can give discordant results with the fetus (false positive or false negative). In contrast to generalized mosaicism, the aneuploidy is confined to the placenta, so that the fetus may be euploid even though the placenta contains aneuploid cells and vice-versa. In rare ca-

ses, placental mosaicism can lead to false-negative results when the placenta is predominantly euploid while the fetus is aneuploid. Isochromosome 21q rearrangements are frequently shown in such cases with false negative NIPT results (Huijsdens-van Amsterdam et al., 2018).

2. Maternal copy number variants (CNVs): Maternal duplications can cause false positive results, while maternal deletions can cause false negative results. However, this is a very rare event because the fetus would have to be aneuploid and the maternal deletion would have to be on the same chromosome.

3. Lower fetal fractions: When the FF is low but relatively sufficient (e.g., between 3 and 5%), there is an ambiguous difference between the observed and expected frequencies for individual chromosomes. If the number of sequenced fragments is not sufficient enough, this difference cannot be determined and false negative test results may occur.

4. Technical issues

THE USE of NIPT IN CLINICAL PRACTICE

Secondary Screening

The goal of screening is to identify individuals in an apparently healthy population who are at increased risk for a health problem so that early treatment or intervention can be offered. In prenatal screening, the purpose of screening is to give people information about increased risk or condition so they can make an informed decision about their care or treatment. The goal of secondary screening is to obtain additional information after the result of primary screening in order to make better decisions. Thus, the main goal of secondary screening in this perspective is to benefit from the high DR and low FPR of cfDNA screening, as it has a higher DR and lower FPR than other prenatal screening methods. The high specificity of the cfDNA tests, i.e., the low number of false positive test results, allows a significant reduction in the number of unnecessary invasive diagnostic approaches in high-risk pregnancies detected by the initial prenatal aneuploidy screening tests. In addition, a significant proportion of patients initially classified as screening positive turn out to be false positives, and a small proportion will be correctly rated as screen

positive because of the high sensitivity of cfDNA tests. Since it has been used in clinical practice, cfDNA screening has reduced unnecessary invasive diagnostic procedures by 40% to 76% (Hui et al., 2017; Warsof et al., 2015). Since cfDNA screening does not provide valid results in 1-5% of cases, invasive diagnostic testing may still be offered in such cases and in individuals who are already considered high-risk.

Primary Screening

Primary screening means conducting any assay, screen or some preliminary tests to identify individuals in an apparently healthy population whose risk for a health problem is unknown. Due to its success in high-risk pregnancies, cfDNA screening in low-risk pregnancies is increasingly preferred by both women themselves and their healthcare providers to traditional serum screening for the detection of aneuploidy. Although there are some concerns, cfDNA testing can be used as a primary screening test. Major issues include insurance coverage, concerns about availability of adequate pretest counseling, and some posttest attempts by some couples to terminate their pregnancies based solely on a positive cfDNA test result without invasive diagnostic testing.

IMPLEMENTATION CHALLENGES

Several factors should be considered when recommending prenatal aneuploidy screening with cfDNA screening to the high-risk group or general population.

1. Prenatal screening is optional, not routine: The decision to undergo prenatal screening depends on the extent to which each couple can afford the benefits of being informed about aneuploidy and the potential emotional and physical risks associated with prenatal screening and diagnostic testing.

2. Genetic counseling: Preferably, genetic counseling should be offered prior to NIPT. Key points to discuss with couples considering cfDNA screening are: the differences between screening and diagnostic testing, the basic principles of NIPT, the conditions that can be detected by screening, the reporting format of results, the efficacy and limitati-

ons of the test, scheduling of the test, and the need to confirm abnormal screening results with invasive diagnostic methods before considering termination of pregnancy (Sachs et al., 2015).

3. Limits of prenatal screening versus diagnostic tests: Couples need to understand the difference between screening tests, which can classify a pregnancy as high or low risk for certain fetal aneuploidies, and diagnostic tests, which can determine whether or not a fetus has chromosomal abnormalities. Also, it is important to note that cfDNA is a screening test that does not detect all genetic syndromes or all aneuploidies. In case of one or more structural fetal anomalies on sonography, prenatal diagnosis by chromosomal microarray analysis (CMA) should be preferred over NIPT (Levy and Wapner, 2018). Couples who wish to obtain maximum genetic information about their fetus may prefer to undergo direct invasive diagnostic testing with CMA without prenatal screening. The cfDNA screening, which is primarily designed to detect common trisomies and sex chromosome aneuploidies, is not diagnostic and cannot unequivocally detect many subchromosomal abnormalities such as microdeletions or microduplications (Valderramos et al., 2016; Vora and O'Brien, 2014; Yaron et al., 2015).

4. Costs: Full or partial coverage of NIPT costs by health insurers varies from country to country, but there is a tendency among health insurers to cover NIPT costs for all pregnant women, regardless of whether there is a risk or not.

5. The performance of individual laboratory: It is not possible to conclude that any laboratory performing NIPT has a superior DR, FPR and failure rate than the others.

MULTIFETAL PREGNANCIES

In twins, NIPT is more complicated than in singleton pregnancies because the two fetuses can be either genetically identical (monozygotic) or different (dizygotic). If aneuploidy is present in a monozygotic pregnancy, both fetuses are affected, whereas in dizygotic twins, if the NIPT has detected aneuploidy, only one fetus or both fetuses may have aneuploidy (Gil et al., 2014; Sarno et al., 2016). The American College of

Obstetricians and Gynecologists (ACOG) and the International Society for Prenatal Diagnosis (ISPD) recommend that cfDNA testing may be offered for prenatal screening for common trisomies in twin pregnancies (Palomaki et al., 2021). The total amount of cfDNA is about 35% higher in twins than in singleton pregnancies, while the individual FF contributions of each fetus are lower in monozygotic twins than in singleton pregnancies and may differ significantly between the two fetuses in dizygotic twins (Canick et al., 2012; del Mar Gil et al., 2014). In cases where a low FF is detected in a blood sample from a woman with a twin pregnancy, the test result is reported as a test failure (no call), to eliminate the possibility of missing a possible trisomy due to a low FF. Results are reported as high or low risk for related aneuploidy for the entire pregnancy because it is not possible to determine by the test if both twins are affected or if only one is affected which one is. However, because of the rarity of triplet pregnancies, few data are available on this issue. For this reason, and because of the lack of reliability of screening options other than NT measurement, the ISPD recommends that cfDNA be considered as a prenatal screening option for triplets after clearly explaining the limitations of the test and emphasizing that the only definitive method of diagnosis is invasive diagnostic testing (Palomaki et al., 2021).

MATERNAL OBESITY

There is an inverse relationship between maternal weight and FF, as described above. The concentration of FF decreases with increasing maternal body mass index (BMI). Higher turnover of apoptotic cells in white adipose tissue and an increase in maternal plasma volume are the main factors leading to a decrease in FF in obese pregnant women (Canick et al., 2013). In a study, pregnant women weighing more than 180 pounds (81 kilograms) were found to be at least three to four times more likely to have a failed test result than pregnant women with a normal BMI (Canick et al., 2013). Similar results were then confirmed in a subsequent larger study (Hopkins et al., 2021). Furthermore, in patients who are 120 kg overweight or have a BMI of 35 kg/m2 or more, postponing testing to more advanced weeks of pregnancy would not be an appropriate approach to effectively reduce the number of test failures, because

the increase in FF occurs more slowly in overweight women (Dyr et al., 2019; Rolnik et al., 2018). Offering an invasive diagnostic test would be the most appropriate approach following a NIPT result that is repeated late in the mid-trimester and the patient is still at high risk.

INTERPRETING NIPT RESULTS

Screen Positive (High Risk)

Despite the high performance of cfDNA screening, patients should be offered invasive diagnostic testing to confirm fetal karyotype if screening is positive. The decision whether to perform chorionic villus sampling (CVS) or amniocentesis may be guided by the couple's choice, current gestational age, presence or absence of structural abnormalities on ultrasound, and the knowledge that a higher degree of placental mosaicism is observed in trisomy 13 and monosomy X than in trisomy 18 and 21 (Gil et al., 2017). There is controversy as to whether this confirmation should be done by CVS or postponed until week 15 or later, when amniocentesis can be done at the earliest because it allows analysis of fetal genotype rather than placental cells (Grati et al., 2015).

Screen Negative (Low Risk)

A negative screening result means that the likelihood of the fetus having the aneuploidy (or aneuploidies) screened for is below the accepted cut-off but it does not completely rule out the possibility of an affected fetus or the possibility of a fetus with a variety of other chromosomal abnormalities not targeted by the screening test but detectable by invasive diagnostic testing. After extensive counseling, pregnant women with screen-negative test results are usually not offered invasive diagnostic testing if there are no indication such as structural abnormality or abnormalities on ultrasound. This recommendation does not apply to fetuses in which an isolated soft marker has been found.

No Call (No Result, Failed Test)

Although there are differences between the preliminary results of the studies, the rate of such "no-call" results has been shown to average about 2% (Gil et al., 2017).

Options for the no call result:

- Repeating the cfDNA test: Some types of failures such as those due to large regions of homozygosity, result in repeated failed test results repeatly, so retesting should not be an option in this case
- Alternative prenatal screening with combined serum markers and ultrasound if not already done. Integrated screening has the highest DR and lowest FPR among standard serum/ultrasound screening methods. Couples should be aware, however, that standard serum/ultrasound screening, even integrated screening, is less sensitive than cfDNA screening and typically screens for trisomies 21 and 18 rather than trisomy 13. On the other hand, in pregnancies with trisomy 18 or 13, where testing fails more frequently than in trisomy 21 pregnancies, there are almost always fetal structural abnormality or abnormalities on second trimester sonography
- Diagnostic testing with karyotyping and/or CMA using invasive procedures including amniocentesis or CVS depending on gestational age.

A few studies reported that the aneuploidy rate in pregnant women with failed cfDNA test results was significantly higher than the expected (Chan et al., 2018; Norton et al., 2015; Pergament et al., 2014). ACOG recommends informing and educating couples that failure of the test is associated with an increased risk of aneuploidy. In such cases, additional genetic counseling by a genetic counselor, a detailed fetal anatomic ultrasonography, and diagnostic testing are required[2].

SCREENING FOR GENETIC DISORDERS and CHROMOSOME ABNORMALITIES OTHER THAN COMMON ANEUPLOIDIES

Conventional aneuploidy screening, consisting of maternal serum screening and ultrasound, is unable to detect sex chromosomal aneuplo-

2 "Screening for Fetal Chromosomal Abnormalities: ACOG Practice Bulletin, Number 226," 2020 (Access Date: 01.05.2022)

idies with the exception of Turner syndrome, which have significant findings on ultrasound such as increased nuchal translucency (NT) in the first trimester or cystic hygroma or/and hydrops in the second trimester (Syngelaki et al., 2014). Furthermore, the total number of cases with sex chromosome abnormalities is too small to draw a definitive conclusion about the performance and implementation of cfDNA screening for such aneuploidies (Nicolaides et al., 2014; Syngelaki et al., 2014).

Hypothetically, cfDNA testing can be utilized to screen for genetic disorders other than the common aneuploidies such as microdeletions, microduplications, and single gene disorders. Currently, none of the available guidelines recommend routine expanded screening for any of these wide variety of genetic disorders in clinical practice. It is possible to detect aneuploidies of other chromosomes, especially with sequence-based methods. Moreover, most of these aneuploidies are lethal in the first trimester, so miscarriage is inevitable. Several laboratories on the market offer screening for selected microdeletion syndromes, including 22q11.2 (DiGeorge syndrome), 5p (Cri-du-chat syndrome), 1p36 and 15q (Prader-Willi and Angelman syndromes). Similar to aneuploidy screening, the overall low prevalence of certain microdeletions and microduplications, together with the 1-2% rate of limited placental mosaicism, may explain some percentage of inaccurate CNV screening results as a limitation (Bunnell et al., 2017). While screening for single gene disorders using cfDNA is commercially available, clinical use is still under investigation and is not routinely recommended (Zhang et al., 2019).

CONCLUSION

In the light of all these evidence to date, NIPT continues to be considered as a screening test rather than a diagnostic method. However, the increase in test accuracy due to improvements in NIPT analysis methodology is also promising for widespread use in screening for monogenic diseases.

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INTERNET RESOURCES

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THE SOCIO-SPATIAL ASPECTS OF URBAN SPACE FOR AN AGEING POPULATION: A COMPARISON OF +60 AGE AND OTHERS

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Abstract: Creating age-friendly cities and communities has become a priority in urban agenda as a result of the global impact of demographic change. The emergence of a variety of housing, community, and environmental needs among elderly persons imposed the idea of ageing in place, supporting people in their own homes and environments for as long as possible. Considering the increasing aging population trend in Türkiye follows a decade behind, the emergent issues could be formulated and performed by defining some priorities in the field. To do so, comparing the perceptions of elders and other age groups about sociospatial characteristics of the urban neighborhood might be a useful starting point. The majority of published research on aging focuses on urban environments in developed countries. The measures for age-friendly urban spaces must be determined within the context of Turkish cities and culture since its unique sociocultural characteristics shape the urban space sociospatially. The pentagon model was adapted? adopted to assess the socio-spatial aspects in comparison to different age groups since it gives a novel viewpoint on human-environment relations sociospatially, as well as embracing the community context. The pentagon model provides five dimensions: person (demographic and household characteristics), place (transportation, walkability, social infrastructure, and shopping), people (neighborliness, and activities with neighbors), perception (attachment, satisfaction with home and neighborhood, and safety and security), and process (participation). A questionnaire survey is conducted in Karsiyaka, Izmir, and resulted in 288 valid samples. The results show

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that +60 ages and other age groups had considerably differing scores in the indicators such as walkability, attachment, satisfaction with home and neighborhood, and activities with neighbors. In detail, although +60 ages are satisfied as much as the other groups in terms of the provision of social infrastructure and shopping opportunities in the neighborhoods, they are not satisfied with their proximity and accessibility by walking. The age group over 60 had a significantly higher score than the other age groups for subcomponents of attachment, except place dependence. In addition, the +60 age ones want to stay in the same house and same neighborhood in the future, whereas the other age group is more willing to move to another one. The elders are more active with their neighbor relations, they salute and chat when they meet, visit each other in their homes, and go shopping or parks together. The results provide valuable insight into the future urban spaces in Türkiye, as an aging population in a developing country. The population projection for 2030 and 2050 shows that as the population ages, cities will face new challenges and possibilities in fulfilling the preferences and requirements of this demographic group. The critical question is whether these sociospatial neighborhood characteristics differ for the elderly and other age groups, and which factors vary through age, or whether they are perceived the same for all ages. By addressing these questions, the significance of ageing issues and urban space priorities might be determined from a viewpoint informed by evidence-based research, for future studies of environmental gerontology in Türkiye and other developing countries. Successful aging and the idea of ageing-in-place are dependent on planning, designing, adjusting, and optimizing the residential areas and built environment for a better relationship between elderly individuals and their sociospatial environment.

Keywords: Environmental Gerontology, Urban Space, Neighborhood, Age-Friendly, Active Ageing, Case Study

INTRODUCTION

In the twenty-first century, demographic aging and urbanization become integrated worldwide phenomena with substantial consequences for human progress including urban space, societies, and economies around the world. While the population of older residents is simultaneously boosting as well as urbanization, the expected life expectancy is also increasing much higher. Population aging is a significant global

trend that is one of the most significant demographic megatrends having social consequences for all parts of society. All nations throughout the world are experiencing population aging, albeit at varying intensities. In 2020, for the first time in history, the number of people aged 60 or older outnumbered the number of children under the age of five. In OECD nations, the percentage of the population aged 65 and over has ascended from 7.7% in 1950 to 17.8% in 2010 and is projected to reach 25% by 2050 (OECD, 2015). The number of the world's population aged 60 and older will have doubled from 11% in 2006 to 22% in 2050. There will be more elderly people than youngsters (ages 0–14) in the population. Developing countries are aging at a much faster rate than developed countries: by 2050, 79% of the world's older people will be living in those countries (United Nations, 2017; WHO, 2018). As an example of a developing country, the population in Türkiye aged 65 and over increased by 22.5% between 2015 and 2020. The proportion of the elderly population in the total population increased from 8.2% to 9.5% in five years. According to population projections, it is predicted that the elderly population will be 11.0% in 2025, 12.9% in 2030, 16.3% in 2040, and 22.6% in 2060 (TÜİK, 2021)[2]. So, the ageing in Türkiye follows the developed countries only a decade behind in population projections.

Gerontology, the study of aging and elderly people, has developed as life expectancy has increased. As individuals age, they demand increasingly specialized and resource-intensive services (Steels, 2015). Researches in this field include various expertises in physiology, social science, psychology, public health, and policy, among others. Gerontology is a comprehensive field of research including the processes associated with bodily changes from middle age through old age, social changes caused by an aging population, and the applications of this knowledge into policy and program, which requires multidisciplinary studies embarrassing the humanities (e.g., history, philosophy, literature) through economics. However, the process of aging cannot be simplified to a set

2 TÜİK (2021). İstatistiklerle Yaşlılar, 2020. https://data.tuik.gov.tr/Bulten/Index?p=Istatistiklerle-Yaslilar-2020-37227#:~:text=T%C3%9C%C4%B0K%20Kurumsal&text=Ya%C5%9Fl%C4%B1%20n%C3%BCfus%20 olarak %20kabul%20 edilen,9%2C5%27e%20y%C3%BCkseldi. Last Accessed: 08.12.2022

of individual markers, such as health status, physical and cognitive performance, and demographics. As some scholars failed to acknowledge, successful aging also depends on the residential and urban settings and caring arrangements of older individuals. Gerontologists who study the environment have long emphasized that individuals do not age in a situational or contextual vacuum. Their ability to remain their active and engaged lifestyles and maintain their optimum physical and mental health routines is contingent upon their residing in states/provinces, communities, neighborhoods, buildings, and rooms that provide appropriate and supporting physical and social settings (Golant, 2014).

The increasing ageing population is not only a health or elderly care issue; all policies, services, urban environments, and mechanisms that enable people to age actively must consider vigorously (Scott, 2021). Creating age-friendly cities and communities has emerged as a popular agenda of urban space. However, identifying the relationship between the aging of the population and urban space is still a novel major area of research. This period of growth has required alternative approaches in domains such as housing, neighborhood design, and planning, among many others. Nevertheless, as highlighted by Dixon (2021), many countries all around the world are not properly prepared for the consequences of the age shift and have not taken the necessary actions to ensure that people may age well. As the population ages and the number of elderly individuals "aging in place" increases, cities will witness new opportunities and challenges in addressing the preferences and requirements of this demographic group (Feldman and Oberlink, 2003).

Historically, the planning and development of contemporary cities focused primarily on supporting productive capacity (van Vliet, 2011), while ignoring the needs of different groups of urban dwellers, what we call as vulnerable ones today, especially elderly residents. As Chiu (2021, p.467) stated: "*Planning and design for age-friendly cities could be seen as re-shaping urbanism for the betterment of the older citizens who are less able to combat the ills of the environment.*" If urban areas are developed with particular groups in mind, mostly adults of working age, either as producers or consumers, then the question arises as to how other groups are destined for in terms of inclusion or segregation, as well as their signifi-

cance to the overall urban life project. Age and generation are important in this context because they give a longitudinal component to the use of urban space that reflects personal life course time (Biggs and Carr, 2015). Elderly individuals are a highly diverse group in terms of income, housing, resources, physical capacities, and their experiences intersect with existing inequalities and disadvantages based on race, gender, disability, etc. (Scott, 2021). Urban planners and policymakers are becoming increasingly conscious of the need for age-friendly cities. Planning and place design can have significant effects on public health and wellness, including for the elderly (Giles-Corti et al., 2015; Lowe et al., 2014).

The World Health Organization (WHO) created the Global Age-Friendly Cities Guide (WHO, 2007b) and a companion "Checklist of Essential Features of Age-Friendly Cities" (WHO, 2007a) to encourage and help cities in becoming more "age-friendly". WHO determined the characteristics of age-friendly cities in eight domains of urban life in collaboration with partners in 35 cities from developed and developing countries. Additionally, in the 2002 Madrid International Plan of Action on Aging, the United Nations recognized the building of supportive and enabling environments as one of three key directions. Cities must assure full inclusion by access of older people to urban areas, structures, and services to leverage the potential of older people for continuing human development (United Nations, 2002).

The majority of published research on ageing focuses on urban settings in the developed world. A few research focused on age-friendly initiatives in the developing world that showed broadly similar ageing challenges, but with fewer resources to address them. In addition, it was noticeable that cultural and socioeconomic factors might impact the efficacy of age-friendly remedies in developing nations (Steels, 2015). Although economic factors affect the efficiency and the scale of interventions in urban settings, the sociocultural differences must be also highlighted in terms of what ageing means for these societies, their socio-spatial characteristics, and behavioral and perceptual settings in urban environments to prosper more actively aging programs. Although the migration from rural to urban areas, and the rise of female professionals in the workforce have diminished the number of traditional family

caregivers all around the world, cultural factors, particularly paternal loyalty, need to be taken into account while considering ageing issues in Türkiye. While more elders prefer to be age-in-place, establishing age-friendly environments and services to ensure that both the elder user and their family are supported throughout the process becomes much more important.

As a consequence of mentioned above, the ageing-friendly criteria in urban spaces should be determined in the context of Turkish cities and culture. Since the ageing and age-friendly cities are a new field of research in the country, there are not any national guides on cities. In addition, although there are abundant theoretical studies in the field, there are limited evidence-based studies on ageing requirements in urban cities. While the urban space is re-conceptualized according to age, the emphasis should also include the sociospatial dimension as well as the physical one and should be discussed simultaneously. Considering the increasing ageing population trend follows a decade behind, the emergent issues could be formulated and performed by defining some priorities in the field. To do so, what aspects of the urban neighborhood are perceived differently by comparing the elders to other age groups could be a good starting point.

In defining an age-friendly community or city, although each study differently developed a list of characteristics from their perspectives, the lists of indicators were remarkably similar. They highlighted the significance of proximity to quality health facilities, a satisfactory public transportation system, a variety of housing types including affordability, a safe and secure environment, access to shopping, a physical environment that encourages walking (walkability), and recreational and cultural opportunities. The most recognized approaches in urban design, as well-known community-based projects, are also very similar to each other, and difficult to distinguish from. These approaches can be listed as new urbanism, sustainable or smart growth cities, universal design, and walkable neighborhoods. So, these planning and development strategies frequently aim for physically compact, mixed-use residential neighborhoods that make walking simpler, more attractive, and safer and could also provide senior citizens with a range of benefits.

This chapter examines the urban neighborhood in terms of its socio-spatial elements, such as transportation, walkability, social infrastructure, and shopping opportunities for daily needs as well as including neighborliness, and activities with neighbors in terms of community relations, and attachment, safety and security, and satisfaction in terms of the desire for staying in residence and neighborhood in future in terms of psychosocial elements of the built environment. The main question is whether there is a difference in these neighborhood criteria between the elderly and other age groups and which criteria vary with age or whether is it the same for people of all ages. By addressing these questions, the significance of ageing issues and the priorities in urban space could be discovered with an evidence-based perspective for future studies in environmental gerontology, both in Türkiye and other developing countries.

A Brief Review of Elderly Studies in Urban Spaces

Since the mid-2000s, there has been a major increase in interest in age-friendly issues, with a special focus on the challenges faced by older people in various types of urban environments. Establishing age-friendly cities and communities has become a critical feature of policies aiming at enhancing the quality of life for older people in cities. The 'age-friendly' concept was initially established by the World Health Organization via an assessment of the experiences of older persons living in urban environments (WHO, 2007b, 2015). This work produced a handbook that identifies the essential criteria of an age-friendly community in terms of service provision (e.g., health services, transportation), the physical environment (e.g., housing, outdoor spaces, and buildings), and social elements (e.g., civic and social engagement). This guide has subsequently become one of the most often utilized instruments for evaluating the age-friendliness of cities and communities.

More recently, the United Nations General Assembly declared 2021-2030 the "Decade of Healthy Ageing"[3] to encourage worldwide action and a whole-of-society approach to improving the lives of older persons,

3 https://www.decadeofhealthyageing.org, (E.T: 8.12.2022)

their families, and communities, both during and after the COVID-19 epidemic (United Nations, 2020). The Covid-19 pandemic vividly illustrated pre-existing sociospatial inequalities within the cities and served as a reminder that society's solution to an aging population has frequently been segregation by default – residential care units, retirement villages, nursing homes – resulting in the isolation of many older people during various lockdowns and restrictions (Scott, 2020). The 2030 Agenda for Sustainable Development of the United Nations advocates for?? leaving no one behind and ensuring that the Sustainable Development Goals are realized for all segments of society, at all ages, with a particular emphasis on the most vulnerable, notably older individuals.

The World Health Organization and The United Nations have been particularly influential in promoting the age-friendly agenda. However, long before these guides, ageing was focused on the studies in gerontology. The environmental context of aging has grown to play a major part in gerontological theory, research, and practice during the past six decades. Environmental gerontology, which is concerned with the description, explanation, and modification or optimization of the relationship between aged people and their sociospatial environment, has evolved as a distinct subfield. There are evidence-based studies on housing design to institutional living, from the micro level of home modifications to the macro level of suggestions for "age-friendly" communities, and even countries (Wahl and Weisman, 2003).

Today, the literature on aging shows that several terms are used to describe and characterize the age-friendly environment. These terms include "age-friendly" often accompanied by city or community, "ageing-in- place", "healthy ageing", "livable city", and "active aging" (Steels, 2015). Although there are slight differences in these terms, it is possible to read this variety as actually one answer to the question: how to provide financially viable, administratively justifiable, spatially accessible, and livable home and urban environments to the elder adults.

The age-friendly trend has contributed to the development of many initiatives and models, both on an international and national scale. Although there are many models for age-friendliness, certain frameworks may be cited in the literature as pioneers for age-friendly cities and com-

munities. First, the guide developed by WHO is based on the idea of active ageing (WHO, 2007b). The guide and its approach are built on the principle that older adults may stay independent and healthy for as long as possible if they get assistance in all aspects of life. The model proposes eight categories concerning the issues that cities will confront and the necessary measures. These eight categories consist of outdoor spaces and buildings, transportation, housing, social participation, respect and social inclusion, civic participation and employment, communication and information, and community support and health services.

Second, the study conducted by Hanson and Emlet (2006) highlights an elder-friendly community model developed by The Advantage Initiative, explores how it was used to identify community assets and areas for development, and explains how this evaluation is guiding measures to improve the quality of life for older persons. It addresses four domains: *1. basic needs* (safety at home and neighborhood, useful information about available services), *2. physical and mental health and well-being* (healthy behaviors, community activities, access to preventive health services, access to medical, social, and palliative services), *3. social and civil engagement* (meaningful connections with family, neighbors, and friends, active engagement to community life, opportunities for meaningful paid and voluntary work, aging issues a community-wide priority), and *4. maximizing the independence for frail and disabled* (resources to facilitate "living at home", accessible transportation, supports for family and other caregivers).

Third, the evaluation guide for livable communities is developed by the American Association of Retired Persons (AARP). The AARP identifies the characteristics of a livable community with eight sections: transportation; walking; safety and security; shopping; housing; health services; recreation and culture; and caring and mutual support. "Livable Communities Evaluation Guide" is intended to inspire us to consider a new perspective on current communities or neighborhoods. Although the guide is prepared from the perspective of older individuals, the highlighted features and services improve livability for individuals of all ages and abilities. The guide includes several questions for community surveys. However, as AARP (2005) indicated, the purpose is not to 'sco-

re' or rate communities, but rather to assist citizens in identifying areas where they may focus their efforts to make their neighborhood more livable for others.

Since this research is conducted in the context of Turkish culture and cities, the studies in the national context should be also mentioned to project the level of academic and theory dimensions that would lead to political and implementation phases in the future. There are many valuable studies in Türkiye on ageing issues. Unfortunately, the majority of these studies only develop a theoretical perspective, and the number of papers offering evidence-based research is fairly limited. There are several scales to aging-in-place from housing to urban space city-wide. The studies on the analysis of the use of urban spaces and/or urban public spaces by elderly individuals (Azak and Belir, 2020; Çelen Öztürk and Turan Kızıldoğan, 2017; Düzenli and Alpak, 2017; Sonmez Turel et al., 2007), and accessibility analysis in the urban area and activities (Bozdağ et al., 2017; Şenol et al., 2022) are valuable for both the elders and the national literature. Another insight is that the majority of an elder's day is enormously spent at home which is a confirmed fact that has been consistently proven in many studies (Baltes et al., 1990). So, the studies on creating elder-friendly home interiors are very important for age-in-place, as well as meeting their expectations and requirements (Cilasun et al., 2020; Eyüboğlu and Zorlu, 2021; Özer Baş, 2020, 2021).

Another worth mentioning issue is the gray literature on the subject of elderliness, especially in graduate and post-graduate studies. Although they have their own challenges, they also have potential contributions and can be considered a precursor to establishing expertise in the field. A recent study focuses on the transformation of the ageing concept via social and spatial studies in post-graduate studies in Türkiye provides valuable insight for conjuncture (Özer Baş, 2022). The first aging-related thesis was written in 1991, and then the ageing wasn't addressed at the graduate level until 2004 (except for a 1997-research). While just 6 studies were prepared for the following 10 years, 24 theses were completed in the past decade. Considering gerontology's 60-year history, the studies in Türkiye have gained momentum just in the last decade, indicating that much work has to be done at the regional and national levels.

Furthermore, the review of the spatial terminology keywords for this research reveals that the focus on spatial typologies is in nursing homes (8 studies), houses (7 studies), environments (6 studies), and parks (and gardens) (5 studies). So, it is reasonable to believe that theoretical studies have not yet succeeded in raising awareness of concepts like active aging, aging in place, and healthy aging, since the major focus was institutionalized facilities. Additionally, terminologically, the shift from "rest home" (yaşlı yurdu) and "sheltered housing" (huzurevi) to "nursing home" (bakım evi) can be traced back to preconceived notions of the Turkish family structure and negative views of these environments. Meanwhile, spatial terminology has evolved as a result of social effects and altered conceptions of the built environment. Hopefully, the use of the terms will also affect the perception positively (Özer Baş, 2022).

The Conceptual Framework for Age-Friendly Research

The most influential concept is "active ageing" among many guiding concepts, which is not limited to being physically active, but rather emphasizes that older people should be able to continue to participate in social, cultural, spiritual, economic, and civic aspects of a city to maximize opportunities for health, participation, and security to improve the well-being of older people. In this respect, the criteria for ageing in urban neighborhoods are determined as transportation, walkability, social infrastructure, and shopping opportunities for daily needs as physical elements; and neighborliness, and activities with neighbors in terms of community relations. Attachment, safety and security, and satisfaction in terms of the desire for staying in residence and neighborhood in the future are the indicators of perceptual elements in the built environment. In this study, institutionalized facilities are excluded since it is not able to be based on the idea of age-in-place, and based on the need for special care medically.

The pentagon model was applied to assess the socio-spatial environment in comparison to different age groups since it gives a novel viewpoint on human-environment relations as well as embracing the community context (Akcali and Cahantimur, 2022). Although the model is developed for social sustainability; it can be adapted?? adopted for the urban space for elders since its main focus is on socio-spatial

aspects of the built environment. The pentagon model provides five dimensions: person, place, people, perception, and process. The "person" with its demographic and household characteristics is one of the model's primary dimensions. By identifying the distinct effects of individual variables on place, people, perception, and process dimensions, urban policy, and planning strategies may be developed more diversely and equitably by integrating them with participation tools, as focused in the aging agenda. Therefore, integrating the person as a dimension of urban space may meet the requirements and expectations of various users and social groups, as well as older people. Since the primary focus is the age variable in this study, the approach in person dimension corresponds with the model's perspective.

The "place" dimension is the most influential factor in the pentagon model since it is strongly connected to design and planning tools and has a significant impact on the other three dimensions, people, perception, and process. Considering the ageing issue in the neighborhood, the place dimension includes the variables for urban spaces such as transportation, walkability, social infrastructure (social, cultural, and recreational facilities), and shopping. The indicators of people, perception, and process may be called a perceptual and social reaction in which urban space plays a vital role in constructing it. By so, the people dimension includes neighborliness, and activities with neighbors. Attachment, satisfaction with home and neighborhood, and safety and security are the components of the "perception" dimension. Lastly, the participation of the citizens in the processes relating to urban space can be assessed with the process dimension (Figure 1).

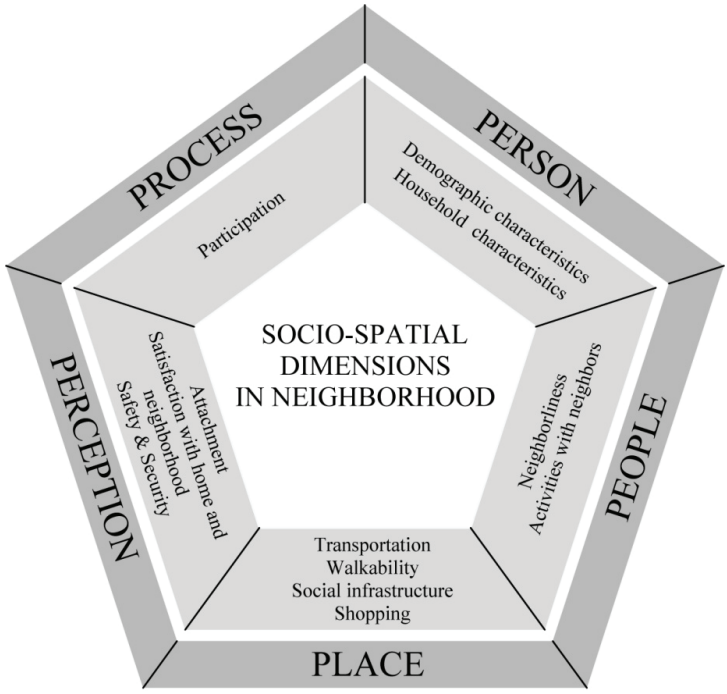

Figure 1: The Socio-Spatial Dimensions in the Neighborhood For an Ageing Population Methodology

In searching for the evidence-based differences in residential neighborhoods between elderly people and others, a questionnaire survey is conducted in three neighborhoods in Karsiyaka, Izmir. Izmir, currently the third largest city in Türkiye, is located in the country's western region and host to about 4 million people. As one of the oldest cities in Anatolia, Izmir's urban growth is based on its natural port structure, which is unique to its geography. Due to the rapid growth of coastal usage as a commercial area, Izmir, a small coastal town in the 17th century, has become a significant population center (Martal, 1999). During the pre-industrial and post-industrial times, its geographical characteristics and geography had a significant influence on its urbanization. Izmir was chosen for the study because its capability of representing both Türkiye and a modern city in a developing country. Karsiyaka, one of the city's major districts around the gulf, is located in the northern part of the metropolitan region. Karsiyaka

did not see major urban development until the middle of the nineteenth century, despite Izmir's regional and economic prosperity (Gündüz and Kiray, 2006). Karsiyaka was chosen as a research location because its urban area reflects 20th-century urbanization patterns in Türkiye.

The research area was chosen from neighborhoods in Karsiyaka, Izmir, which are located in the central city, and reflect the features and dynamism of a contemporary urban area. The neighborhoods were chosen as study locations based on a variety of factors, including planned urban development, the provision of social infrastructure in a variety of typologies, open spaces, and the provision of daily operations to comprise all the indicators in the framework. The questionnaire was developed based on previous discussions, as two parts. The first section contains questions addressing the participants' demographic characteristics. The second section comprises questions regarding socio-spatial indicators of urban space, as shown in Figure 1. Respondents were requested to score each indicator-related statement on a 5-point Likert scale. A spatially stratified random sample was used to choose participants to ensure that there were representatives from a wider range of neighborhoods and building types and floors. Based on 300 samples, a total of 288 valid questionnaires were analyzed, yielding a validity rate of 96%.

The Comparison of Socio-spatial Elements between +60 Ages and Other Age Groups

The questionnaire data were analyzed using Version 24 of the Statistical Package for the Social Sciences (SPSS). The reliability analysis was conducted to evaluate the internal consistencies of the indicators. The Cronbach's alpha (α) value was 0.927, which was acceptable for the present sample (Nunnally and Bernstein, 1994). First, the two age groups were analyzed with a chi-square test of independence for the differences in terms of the demographic variables. Second, the data were analyzed with independent t-tests in comparing +60 ages and the other age groups in terms of their score of each subcomponent.

The demographic variables of the participants are shown in Table 1. The characteristics such as marital status and number of children are

significantly different, as expected since the life course of different age groups. However, the differentiation in education level, and home ownership status between age groups indicates two results: First, the increase in demand for elderly-friendly housing and an age-friendly living environment is not the only result of awareness of aging or increasing population, but as Chiu (2021) stated, the demands are also expected to be increasingly heterogeneous as the elders are better educated. Since Türkiye follows the increasing aging population trend a decade behind, it will face the demands of well-educated elders in recent future. The second result is that homeownership is much higher in the +60 age group comparing the others, as well as higher than the house ownership average of the country which is %61,1 (OECD, 2019)[4]. More specifically, 79.2% of elder participants are homeowners whereas 51.1% of the other age group were homeowners.

Table 1: Person Dimension: Demographic Characteristics of Participants

		+60 ages		Other age groups		
Demographic Variables		n	%	n	%	p
Gender	Female	46	42,6%	101	56,1%	0,000*
	Male	62	57,4%	79	43,9%	
Marital Status	Single	4	3,7%	55	30,6%	0,000*
	Married	66	61,1%	109	60,6%	
	Divorced	6	5,6%	9	5,0%	
	Widow	32	29,6%	7	3,9%	
Number of Children	None	4	3,7%	68	37,8%	0,000*
	Only child	26	24,1%	58	32,2%	
	Two children	62	57,4%	47	26,1%	
	Three children and above	16	14,8%	7	3,9%	

4 OECD (2019). OECD Statistics. https://stats.oecd.org, (E.T: 8.12.2022)

Education Level	Literate	2	1,9%	1	0,6%	0,010*
	Primary school	12	11,1%	4	2,2%	
	Secondary School	8	7,4%	6	3,3%	
	High School	28	25,9%	53	29,4%	
	Bachelor's degree	52	48,1%	100	55,6%	
	Post-graduate	6	5,6%	16	8,9%	
Homeownership status	Owner	84	79,2%	92	51,1%	0,000*
	Tenant	18	17,0%	69	38,3%	
	Public lodgement	2	1,9%	5	2,8%	
	Owned by a family member	2	1,9%	14	7,8%	

***Significance level is 0.95**

The two groups were then compared using independent t-tests to determine whether the scores of sociospatial indicators differed statistically or not. For a more comprehensive analysis, each subcomponent was analyzed independently to determine its influence rather than averaging of the main indicator. There are significantly different scores in the subcomponents such as walkability (Table 2), attachment, satisfaction with home and neighborhood (Table 3), and activities with neighbors (Table 4) ($p<0.05$). Surprisingly, there is no statistical difference between the +60 age and the other age groups in the indicators of transportation, social infrastructure, shopping, security and safety, neighborliness, and participation.

For the place dimension of the pentagon model, transportation, walkability, social infrastructure (social, cultural, and recreational facilities), and shopping opportunities were questioned (Table 2). The age group over 60 had a significantly lower score than the other age groups for subcomponents for walkability, except for the health services. Although +60 ages are satisfied as much as the other groups in terms of

the provision of social infrastructure and shopping opportunities in the neighborhoods, they are not satisfied with their proximity and accessibility by walking (Figure 2). As Chiu (2021) states, regardless of the extent of the provision, the physical accessibility of the facilities and amenities is critical for older people. This result is also echoed by the city-wide study on elders who preferred to age-in-place, specifically 89% of respondents, identified accessible elderly care and support services, medical services, social and recreational facilities and activities, and the accessibility of the neighborhood itself as significant determinants for ageing in place (Chiu et al., 2015). In addition access to facilities, opportunities for social and physical activities, especially proximity to public spaces in good conditions and green spaces, have a positive effect on the health and longevity of older people (de Vries et al., 2003; Takano et al., 2002), and is associated with slower rates of cognitive decline over time (Clarke et al., 2015).

Table 2: Place Dimension: Comparing +60 Ages and Other Age Groups

	Indicators	**+60 ages** Mean (Std. dev.)	**Other age groups** Mean (Std. dev.)	t	p
Transportation	Walking opportunities	4,22 (,71)	4,24 (,73)	-,188	,851
	Connection to the wider neighborhood	4,28 (,68)	4,24 (,78)	,367	,714
	Public transport	4,28 (,75)	4,34 (,71)	-,751	,454
	Biking	3,40 (1,16)	3,23 (1,17)	1,138	,256

Walkability	Sidewalks	3,41 (1,20)	3,66 (1,06)	-1,826	,069**
	Proximity to shopping	4,11 (,76)	4,28 (,66)	-2,014	,045*
	Proximity to health services	3,72 (,994)	3,68 (1,019)	,331	,741
	Proximity to recreational activities	2,69 (1,12)	3,58 (1,07)	-6,566	,000*
	Proximity to cultural activities	2,92 (1,24)	3,73 (,96)	-6,077	,000*
Social infrastructure	Health facilities	3,89 (1,05)	3,77 (1,11)	,888	,375
	Cultural facilities	2,96 (1,18)	3,08 (1,09)	-,867	,387
	Performing art facilities	3,37 (1,03)	3,52 (1,00)	-1,174	,242
	Sports facilities	3,61 (1,03)	3,57 (1,01)	,342	,733
Shopping	Food and beverage facilities	4,49 (,53)	4,53 (,68)	-,553	,581
	Open spaces	3,76 (1,07)	3,88 (,93)	-1,021	,308
	Retails	4,56 (,56)	4,48 (,59)	1,015	,311
	Daily shopping (grocery, market, etc.)	4,70 (,49)	4,64 (,52)	,946	,345
	Finance activity options (banks, ATMs, etc.)	4,50 (,66)	4,42 (,74)	,933	,351

***Significance level is 0.95, ** Significance level is 0.90**

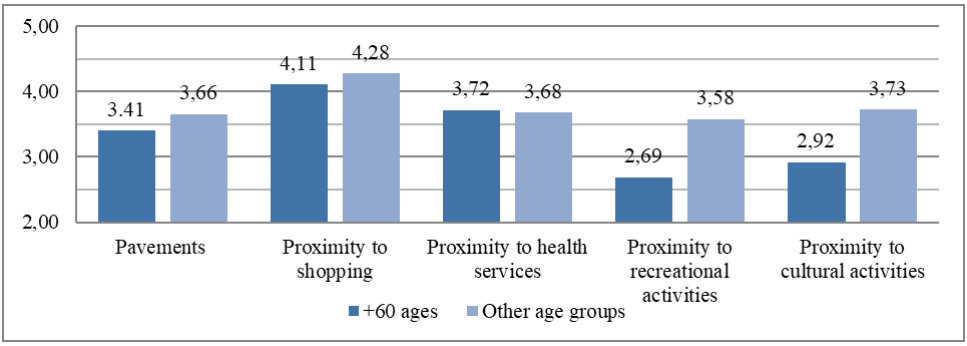

Figure 2: The Differences in Walkability between +60 Ages and Other Age Groups

Walking is the oldest mode of transportation, and sidewalks are the basic components of a pedestrian network. Sidewalks are an essential resource for older people to remain active and engage with others. Unfortunately, in too many cities, the transportation system was designed with the automobile in consideration, with little regard for the requirements and preferences of pedestrians. The absence of sidewalks, their poor design, and their lack of maintenance might discourage and prevent people who may walk for reaching their destinations (AARP, 2005). In addition, there is a recreational aspect of walking beyond its significance as a mode of transportation. However, there are many challenges for pedestrians, such as weather, discontinuous and disjointed routes, traffic conflicts, difficulty in crossing streets, personal security, and obstructions. Reconstructing the existing infrastructure for closer proximity is not a realistic or practical solution. However, the sidewalks could be reconstructed for safer, more enjoyable, and more adequate pedestrian systems. Further research is needed to discover the strategies for how long distances can be perceived much closer than it is in the reality, by considering the declining physical capabilities of the elderly.

For the perception dimension of the pentagon model for sociospatial aspects, attachment, satisfaction with home and neighborhood, and safety and security were questioned (Table 3). As a result of the different approaches and theoretical formulations of the studies on place attachment, there are different concepts in expressing the spatial emotional

bond in the literature such as place attachment (Gerson et al., 1977), place identity (Proshansky, 1978), and place dependence (Stokols and Shumaker, 1981). The age group over 60 had a significantly higher score than the other age groups for subcomponents for attachment, except place dependence. So, the elderly are attached to their neighborhoods and perceive them as a reflection of their identity, whereas they are not dependent on it. In addition, the +60 age ones want to stay in the same house and same neighborhood in the future, whereas the other age group below 60 is more willing to move to another house and neighborhood in the future compared to the +60 age ones (Figure 3). This result is echoed in many studies about the preferences of many elders in ageing in place (AARP, 2000; Alidoust and Bosman, 2016; Baldwin et al., 2020). Their reasons include familiarity with the home and neighborhood social interactions with surrounding friends and neighbors, the memories and life experiences they have associated with their home. The older adults frequently attempt to remain in or near the same neighborhood (AARP, 2005).

Table 3: Perception Dimension: Comparing +60 Ages and Other Age Groups

	Indicators	**+60 ages** Mean (Std. dev.)	**Other Age Groups** Mean (Std. Dev.)	t	p
Attachment	Attachment to neighborhood	4,07 (,98)	3,84 (,97)	1,931	,054**
	Place dependence	3,91 (,90)	3,85 (,92)	,505	,614
	Reflection of self	4,02 (,99)	3,77 (,99)	2,036	,043*
Satisfaction with home and neighborhood	The desire for staying in the neighborhood	3,94 (1,24)	3,20 (1,36)	4,585	,000*
	The desire for staying in the house	3,59 (1,44)	2,81 (1,38)	4,510	,000*

Safety and Security	Car traffic	3,39 (1,27)	3,36 (1,18)	,224	,823
	Safety at daylight	4,24 (,88)	4,29 (,69)	-,574	,567
	Safety at night	3,93 (1,14)	4,03 (,95)	-,856	,393
	Safety of children	4,00 (,93)	4,07 (,86)	-,663	,508
	Safety compared to city	4,15 (,79)	4,29 (,77)	-1,415	,158
	Safety for properties	3,94 (,85)	4,02 (,90)	-,737	,462

***Significance level is 0.95, ** Significance level is 0.90**

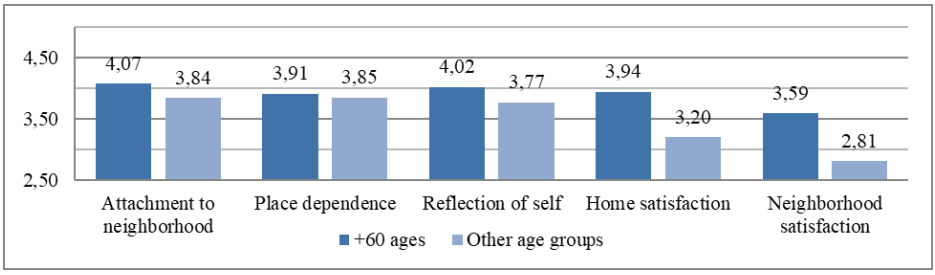

Figure 3: Differences in Attachment and Satisfaction between +60 Ages and Other Age Groups

In the context of the people dimension, the neighborliness and activities with neighbors were compared (Table 4). Although there is not any statistical difference between the +60 age and other age groups in terms of the sense of neighborliness, there are many differences in the activities with neighbors. The elders are more active with their neighbor relations, they salute and chat when they meet, visit each other in their homes, and go shopping or parks together. However, visiting café/ restaurants and attending cultural activities such as theater or cinema are the lowest-scored activities among others for both groups (Figure 4). Activities with neighbors are vital for elder individuals. As shown in focus group discussions, good neighborhood interactions and a familiar environment enhanced a sense of security and improved neighborhood attachment (Chiu, 2021)

Table 4: People Dimension: Comparing +60 Ages and Other Age Groups

	Indicators	**+60 ages** Mean (Std. dev.)	**Other Age Groups** Mean (Std. Dev.)	t	p
Neighborliness	Kinship in neighborhood	3,33 (1,07)	3,36 (1,09)	-,219	,827
	Recognizing neighbors	3,59 (1,01)	3,53 (1,08)	,504	,614
	Sense of neighborliness	3,59 (1,08)	3,48 (1,12)	,810	,418
	Attendance in neighbor activities	3,94 (,89)	3,80 (1,04)	1,165	,245
Activities with neighbors	Saluting	4,57 (,53)	4,24 (,83)	3,671	,000*
	Chatting	4,19 (,69)	3,89 (,99)	2,668	,008*
	Visiting in home	3,09 (1,32)	2,77 (1,28)	2,026	,044*
	Going shopping	2,87 (1,22)	2,61 (1,31)	1,699	,090**
	Going to parks	3,02 (1,36)	2,73 (1,29)	1,811	,071**
	Going to café/ restaurants	2,57 (1,36)	2,61 (1,36)	-,190	,850
	Going to the cinema/theater	2,04 (1,12)	2,08 (1,24)	-,316	,752

***Significance level is 0.95, ** Significance level is 0.90**

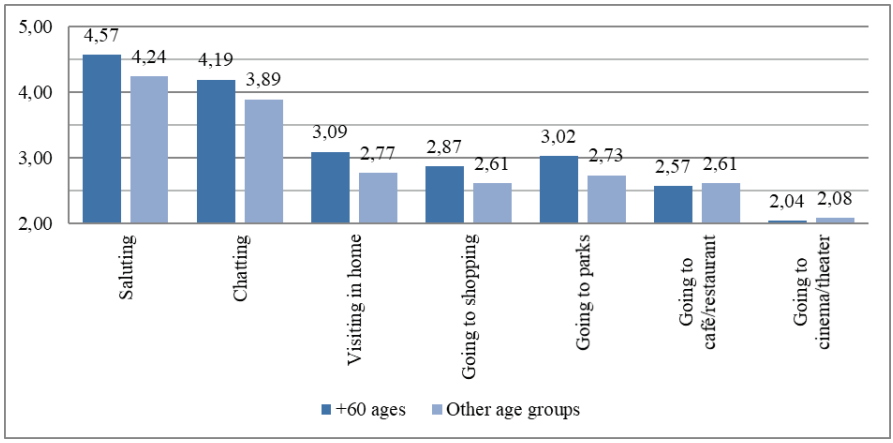

Figure 4: Differences in Activities with Neighbors between +60 Ages and Other Age Groups

Many studies and guides emphasize the value of the participation of elders. A debate including the active involvement of elders may begin to highlight the characteristics of the community that make it livable and identifies the difficulties and concerns and adequately reflects their interests and concerns (AARP, 2005). However, there is not any statistical difference between age groups that would indicate that elders are more willing to participate (Table 5). Buffel et al. (2012) explain it as a 'paradox of neighborhood participation' that also applies to older adults. Elderly individuals tend to spend a considerable amount of time in their neighborhood (being a part of the city), yet they are frequently the last to be included in decision-making processes within their neighborhood (taking part in the city).

Table 5: Process Dimension: Comparing +60 Ages and Other Age Groups

	Indicators	**+60 ages** Mean (Std. dev.)	**Other Age Groups** Mean (Std. dev.)	t	p
Partici-pation	Voluntary asso-ciations	3,61 (1,13)	3,63 (1,09)	-,117	,907
	Non-govern-mental organiza-tions	3,32 (1,04)	3,56 (1,10)	-1,623	,106
	Local decisions	3,68 (1,19)	3,79 (1,01)	-,786	,432
	Planning deci-sions	3,43 (1,16)	3,49 (1,11)	-,393	,695

CONCLUSION

In the following decades, many countries are likely to face many pressures across the cities as growing ageing populations. Remedying ageing issues in urban spaces requires a tremendous combination of knowledge from a variety of disciplines, including urban sociology, urban economics, design, and planning. It necessitates transdisciplinary thinking and the implementation of policies to address the socio-cultural and sociospatial determinants of healthy ageing, such as housing, transportation, leisure, and the design of the urban environment. The worldwide aging of urban populations requires the implementation of more age-friendly policies in urban areas. National and local governments, corporations, and community organizations should acknowledge the significance of aging, especially in urban spaces. The urban environment is a multi-faceted setting for promoting the well-being and contributions of older persons in both the developed and developing worlds. The initiatives of international organizations such as WHO and the UN, have urged cities to take an approach to urban interventions that are age-friendly. Türkiye, as a developing country, should include age-friendly policies in urban (re)development, regeneration, management, and governance to ensure that the needs of all ages are satisfied.

The age-friendly approach may establish preventing or reducing the inequities related to urban life, particularly in terms of their influence on the neighborhoods where individuals may have spent the majority of their lives. Hopefully, the findings of this study will guide the design of future urban areas, not just in developing cities like Izmir, but also in developed cities. It is possible to develop solutions for future communities by analyzing the factors that affect elder individuals in the urban context. Using the pentagon model, this study investigated the socio-spatial features of urban space that have a different impact on the elder's perspective compared to other age groups. First, the dimensions of the socio-spatial context of the neighborhood are determined as person (demographic and household characteristics), place (transportation, walkability, social infrastructure, and shopping), people (neighborliness, and activities with neighbors), perception (attachment, satisfaction with home and neighborhood, and safety and security), and process (participation). Then, by conducting a questionnaire survey in Karsiyaka, Izmir, the indicators are compared based on a threshold of age. The results show that +60 ages and other age groups had considerably differing scores in the indicators such as walkability, attachment, satisfaction with home and neighborhood, and activities with neighbors. The socio-spatial aspects of urban space can influence how older people age in the urban setting, determining whether they live independently or as dependent. To better comprehend the issues faced in the developing world, further study and discussions are required on how to manage an aging population in a situation with limited or scarce resources. As a result of this study, the emergent issues may be listed as walkability, the proximity of goods and services, and opportunities for neighborly activities, with a high priority on ageing in place as much as possible.

The findings provide governments, legislators, urban academics, planners, and architects with valuable information to assist them design and implementing initiatives to make cities more age-friendly. However, there are some methodological limitations, including its dependence on self-reported data, which may be vulnerable to reporting bias despite efforts to reduce it. In addition, further research in environmental gerontology is also recommended to investigate the perception of proximity in

elder individuals, and how to increase walkability through design elements such as street furniture, landmarks, etc, to make longer distances seem closer and be traveled more conveniently. Lastly, there are also important results on place attachment of elders, and homeownership compared to others. The place attachment in elders should be further investigated whether it is a result of homeownership and length of residence, and whether other latent variables exist. The questionnaire addressed how the level of various indicators changes according to age but failed to investigate the reasoning behind some differences. Another suggestion is about affordable housing which is emphasized in many studies and guides. The enormous difference in homeownership in age groups could indicate that the elders cannot financially afford to stay in these neighborhoods as a tenant. Further studies should determine whether the financial vulnerability of elders causes this differentiation, or it is a result of housing subsidies of governmental policies and housing loans in different periods. Since the majority of evidence-based elder studies prefer focus groups to identify their problems and expectations, the questionnaire also should be enhanced with focus group discussions.

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