

Implementation Science Hub

TO END HIV

ADDRESSING THE KNOWLEDGE GAPS IN THE PREVENTION OF HIV TRANSMISSION FROM MOTHER TO NEWBORN IN TRIPOLI UNIVERSITY HOSPITAL, LIBYA: AN IMPLEMENTATION RESEARCH STUDY

By

Dr. Akram R. Alhibeeshi

Cohort-01

2022 – 24

Under the Guidance of

Professor **Dr. Neetu Purohit**

IIHMR University

Professor **Dr. Monira A Dakheel**

Tripoli university

ABSTRACT

Mother-to-child transmission (MTCT) of HIV remains a significant public health challenge, especially in regions affected by political instability and conflict. This study aims to identify gaps in the prevention of HIV transmission between mothers and newborns at Tripoli University Hospital in Libya. This country has faced considerable disruption in its healthcare services due to ongoing internal conflicts. Despite global efforts to reduce MTCT rates, the prevalence of HIV among children remains alarmingly high, particularly in settings where healthcare infrastructure is compromised.

The objectives of this study were to assess mothers' knowledge regarding HIV transmission, design and implement a targeted training strategy, and evaluate the impact of this intervention on their knowledge and behavior. The study was conducted in three stages: a pre-intervention assessment, an intervention phase, and a post-intervention evaluation. The pre-intervention assessment involved a questionnaire administered to two groups of mothers those attending the Pediatrics Infectious Diseases Department and those visiting the Obstetrics and Gynecology Department at Tripoli University Hospital. A total of 300 mothers participated, including both HIV-positive and HIV-negative individuals

The findings revealed that the majority of mothers (52%) were between 20-30 years old and had moderate educational levels, with 56% unaware of the basic definition of HIV. However, 67.3% of participants were aware of the causes of HIV, and 58.7% demonstrated a satisfactory level of knowledge overall. The study also found significant relationships between knowledge levels and factors such as age, education, employment status, and access to antenatal care.

An intervention program was implemented, comprising educational sessions and awareness campaigns, which resulted in a marked improvement in the participants' knowledge about HIV transmission, as evidenced by pretest and posttest evaluations.

This research highlights the critical need for ongoing education and awareness programs to reduce the MTCT of HIV in Libya, particularly in conflict-affected regions. The findings underscore the importance of integrating HIV prevention into maternal healthcare and suggest that targeted interventions can significantly enhance knowledge and practices, contributing to the broader goal of controlling the HIV epidemic in the country.

Keywords: Mother-to-child transmission (MTCT), HIV, Libya, Public Health Implementation Science, Training Strategy, Prevention of HIV, Maternal healthcare, Tripoli University Hospital.

Chapter One

Introduction



INTRODUCTION

- THIS CHAPTER PRESENTS A BRIEF INTRODUCTION TO THE MAIN STUDY. IN PARTICULAR, THE CHAPTER FOCUSES ON THE STUDY'S IMPORTANCE, THE STUDY, THE THEORETICAL FRAMEWORK OF THE STUDY, THE STUDY QUESTIONS, AND THE STUDY'S AIMS.

BACKGROUND

Transmission of HIV occurs from mother to child, or vertical transmission of HIV occurs when the virus is passed from a mother to her child during pregnancy, childbirth (labor and delivery), or breastfeeding (breast milk)

According to the (annual reports, of UNAIDS, in 2021), 1.7 million children under the age of 15 are infected with HIV. According to reports (World Health Organization, 2023), mother-to-child transmission represents more than 90% of these infections among children, given that about 1.3 million pregnant women and girls infected with HIV give birth to children with a transmission rate ranging from 15% to 45%. in the absence of prevention intervention.

According to reports (UNICEF, 2023), which indicated a significant decrease of 52% in new HIV infections among children between the ages of 0 and 9 years since 2010, however, the statistical figures indicating transmission of infection are still large and frightening. Cohen et al., (2011) indicated that mother-to-child transmission of HIV is the main source of HIV infection in children.

The human immunodeficiency virus (HIV) is a serious health problem, especially in many developing countries, and military conflicts and political instability are reasons for the increase HIV problem (Sallam, et al, 2022).

Libya is considered the second largest country in Africa and has the longest coastline in the Mediterranean basin. Since 2011, it has witnessed a major devastating armed conflict, which has caused the continuous interruption of health care services and the internal displacement of large numbers of the population. The number of internally displaced people was approximately 1.5 million people in Libya Out of a total population of 6 million people.

In the period from 1998 to 2007, Libya witnessed one of the largest cases of HIV infection in children as a result of the involvement of five Bulgarian nurses and a Palestinian doctor who were working at Al-Fateh Children's Hospital in the city of Benghazi. They were accused of injecting more than 400 Libyan children with blood contaminated with the AIDS virus. (Maartens G, et al , 2014). The epidemic spread is associated with segments of society of high risk, such as prisoners and drug users. (Daw, 2016).

Many studies, including a study (Salha, et al, 2024) indicated that pregnant women have a low level of knowledge about HIV, so it is necessary to develop programs and studies that aim to make them aware of the causes of this disease, and how it is transmitted from mother to child, which can enhance their behavioral change.

A study (Najla, et al 2023) concluded that the spread of HIV among Libyan patients is increasing and that ongoing intervention programs for the burden of HIV disease and efforts to evaluate and work to eliminate the factors causing HIV infection are important and necessary elements in the effective response to the HIV epidemic in Libya.

Through this, we realize that public health programs in Libya should pay great attention to developing awareness programs for mothers about the danger of HIV infection. Hence, it is important to conduct this current study.

Given the ongoing internal conflicts in Libya, this study serves as a crucial intervention to raise awareness among pregnant mothers about the life-threatening risks of HIV transmission.

Drawing from previous clinical experience in public health research, HIV testing for pregnant women and all HIV-exposed infants within six weeks of birth has been recommended for over a decade. However, there remains a significant lack of knowledge regarding the transmission of HIV from mothers to newborns and the grave danger this poses to children's lives.



AIMS OF THE STUDY



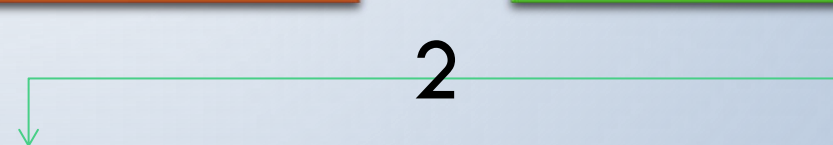
1- Assess the mother's knowledge of HIV transmission from mother to newborn.

1



2- Design a training module for HIV-infected mothers and examined pregnant mothers.

2



3- Conduct the new training module

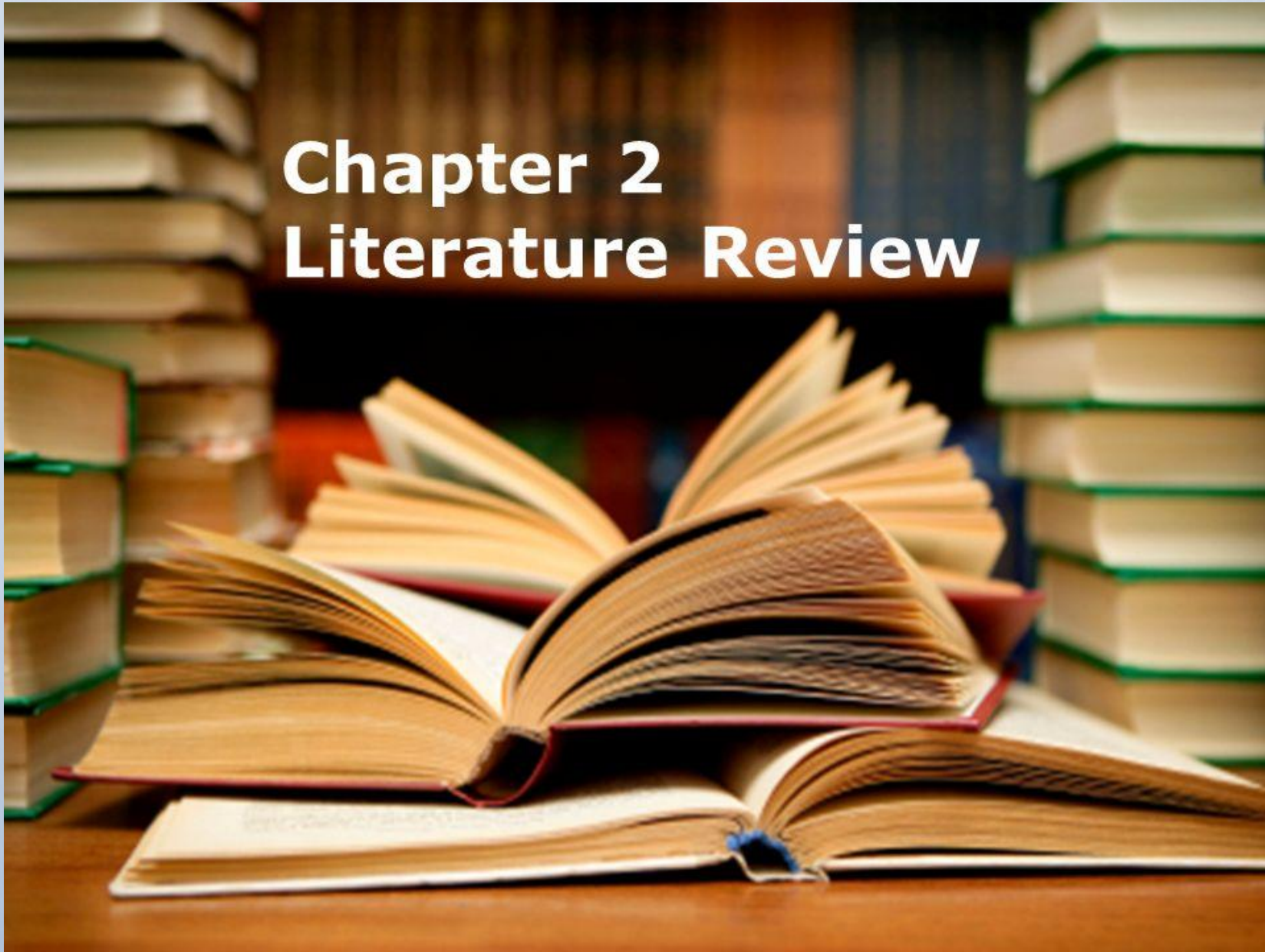
3



4- Evaluate the impact of the new training module on the mother's knowledge of HIV transmission from mother to newborn.

Chapter 2

Literature Review



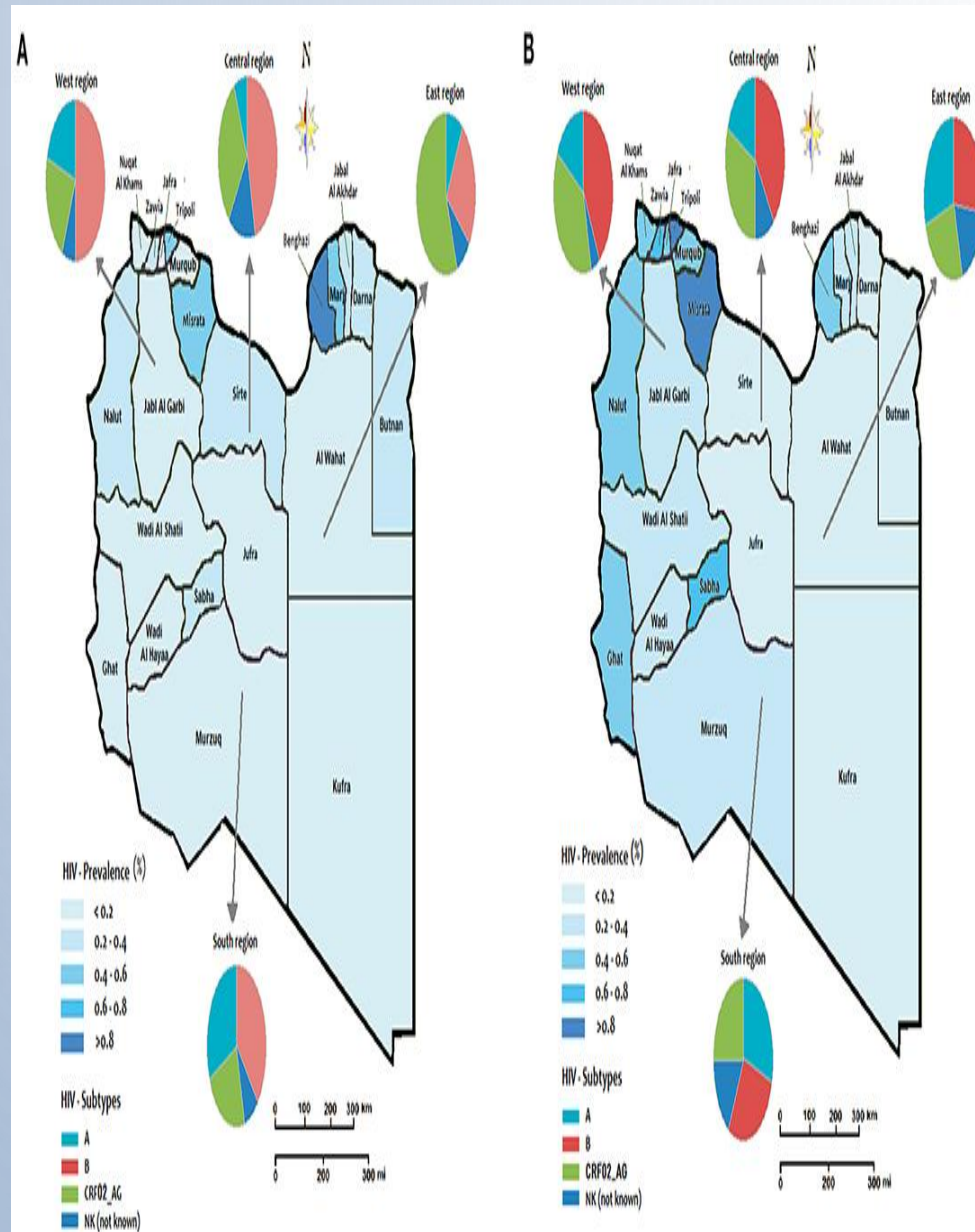
REVIEW OF LITERATURE

The risk of HIV transmission from an untreated mother living with HIV to her child ranges from 15% to 45% depending on the presence and duration of breastfeeding. Three main steps needed to reduce mother-to-child transmission include early identification of HIV-infected pregnant women, treatment of HIV-infected pregnant women with efficacious antiretroviral therapy (ART), and prophylaxis for HIV-exposed infants. A recent study shows that when a collective community effort is focused on these activities, the rate of transmission drops to less than 1%. (Sallame et al, p745)



The proportion of pregnant women living with HIV who received efficacious ART doubled in the 22 priority countries from 37% in 2009 to 77% in 2014. Countries that provided more efficacious regimens had also adopted the 2023 World Health Organization Consolidated Guidelines on the Use of Antiretroviral Drugs for Treatment and Preventing HIV Infections. (World Health Organization Report. 2023).

PREVALENCE AND TRANSMISSION OF HIV IN LIBYA



- THE MIDDLE EAST AND NORTH AFRICA (MENA) REGION HAS THE WORLD'S LOWEST HIV PREVALENCE, UNDER 0.1%. DESPITE THIS, NEW INFECTIONS ARE RISING, WITH AN ESTIMATED 20,000 NEW CASES IN 2019, A 25% INCREASE SINCE 2010. AIDS-RELATED DEATHS IN THE REGION WERE 9,800 IN 2018. (WHO, 2023).
- LIBYA, KNOWN FOR ITS CONSERVATIVE STANCE, WAS INITIALLY THOUGHT TO HAVE NO HIV CASES. EARLY STUDIES, INCLUDING A 1988 REPORT SCREENING 2,064 LIBYANS AND A 1991 STUDY OF 10,000 SPECIMENS, FOUND NO HIV INFECTIONS (UNAIDS, 2014). HOWEVER, BY 1998, HIV BECAME A PUBLIC ISSUE WHEN FIVE BULGARIAN NURSES AND A PALESTINIAN DOCTOR WERE ACCUSED OF DELIBERATELY INFECTING OVER 400 CHILDREN WITH HIV AT A BENGHAZI HOSPITAL, LEADING TO THE ESTABLISHMENT OF THE NATIONAL AIDS PROGRAMME (NAP) IN 2002. (WHO, 2023).
- DESPITE EFFORTS SUPPORTED BY AN EIGHT MILLION EURO GRANT AND CONSULTANCY FROM THE LIVERPOOL SCHOOL OF TROPICAL MEDICINE, THE DEVELOPMENT OF A NATIONAL STRATEGY HAS BEEN DELAYED DUE TO THE 2011 LIBYAN CIVIL WAR. ALTHOUGH A TEMPORARY PEACE WAS ACHIEVED, ONGOING POLITICAL INSTABILITY HAS CONTINUED TO HINDER HIV RESPONSE EFFORTS. THE 2015 COUNTRY PROGRESS REPORT NOTED MINIMAL PROGRESS AND OUTDATED DATA. (YAH, 2019).
- RECENT RESEARCH INDICATES THAT HIV PREVALENCE IN LIBYA HAS BEEN LOW BUT INCREASING. STUDIES FROM 2004 TO 2020 SHOW A RISE IN PREVALENCE FROM 0.13% IN 2004 TO 0.2% IN 2019 (ELGALIB ET AL., 2021). REGISTERED CASES ALSO FLUCTUATED: 10,557 IN 2000, 10,700 IN 2002, AND 10,450 IN 2007, WITH A TOTAL OF 8,486 CASES REPORTED FROM 1993 TO 2017. (KURTAY ET AL., 2022).

The number of Women Living with HIV (WLWH) has steadily increased. From 1993 to 1997, 22.3% of 975 cases were female, and from 2013 to 2017, 22.3% of 2,147 cases were female (Oraby, 2021).



Data collection remains challenging due to limited and outdated reports. Discrepancies in case numbers are noted, with varying reports stating 6,000 to 12,000 cases over the years (Alavian, 2016; Musarandega et al., 2017). By 2018, HIV cases reportedly rose to around 10,000, with women comprising 25-30% of the cases. In November 2020, the number was approximately 6,000, with women making up 35-40%. (WHO, 2023).



AIDS-related mortality data are also scarce. The 2022 Libya Country Report revealed a near doubling of AIDS-related deaths from 2016 to 2019 ($n = 121$), attributed to the conflict's impact on the health system and antiretroviral medicine shortages. (Elsheikh et al., 2023).

LIBYAN POLICY ON PREVENTION OF MOTHER-TO-CHILD TRANSMISSION OF HIV (PMTCT)

Libya's approach to preventing mother-to-child transmission (PMTCT) of HIV has been shaped by international guidelines, primarily those issued by the World Health Organization (WHO). However, political instability and ongoing conflicts have posed significant challenges to the consistent implementation of national PMTCT programs.

Currently, the Ministry of Health in Libya, in collaboration with international organizations, has adopted the following key strategies to prevent MTCT:

i. Antenatal HIV Testing and Counseling: Pregnant women are encouraged to undergo HIV testing as part of their routine antenatal care. Counseling services are provided to those who test positive, ensuring they understand the importance of treatment and the available options for preventing transmission to their child. (WHO, (2021). Consolidated guidelines on HIV prevention, diagnosis, treatment, and care for key populations), (

ii. Provision of Antiretroviral Therapy (ART): HIV-positive pregnant women are provided with ART throughout their pregnancy, during labor, and while breastfeeding. ART has been proven to reduce the risk of transmission from mother to child to less than 5% when administered correctly. (Libyan Ministry of Health. (2023). National Policy for Prevention of Mother-to-Child Transmission of HIV), (UNAIDS. (2023).

iii. Safe Delivery Practices: HIV-positive women are offered guidance on safe delivery options, including the possibility of cesarean delivery, which can reduce the risk of HIV transmission during childbirth. (Libyan Ministry of Health. (2023). National Policy for Prevention of Mother-to-Child Transmission of HIV), (UNAIDS. (2023). Global HIV & AIDS statistics — Fact sheet)



iv. Infant Prophylaxis and Safe Feeding Practices: HIV-exposed infants are given prophylactic ART for a defined period after birth to reduce the risk of infection further. Mothers are counseled on safe infant feeding practices, with breastfeeding recommendations depending on access to clean water and alternative nutrition options. (Libyan Ministry of Health. (2023). National Policy for Prevention of Mother-to-Child Transmission of HIV), (UNAIDS. (2023). Global HIV & AIDS statistics — Fact sheet)



v. Capacity Building for Healthcare Workers: Continuous training and capacity building for healthcare providers, particularly those working in maternal and child healthcare settings, have been emphasized to ensure the effective delivery of PMTCT services.

MANDATORY HIV TESTING POLICIES

In Libya, HIV testing is mandated for several key situations to ensure public health and safety. The following are the primary contexts in which HIV testing is required:

i. **Marriage Certificate:** An HIV test is compulsory before issuing a marriage certificate, aimed at informing both partners of their HIV status and preventing transmission.

ii. **Driving Licenses:** Individuals must undergo HIV testing as part of the application process for driving licenses to maintain public health standards.

iii. **Hospital Admissions:** HIV testing is required for individuals seeking admission to hospitals, ensuring that health care providers are aware of patients' HIV status for appropriate care and infection control.

iv. **Antenatal Care (ANC):** Pregnant women are required to undergo HIV testing as part of routine antenatal care to prevent mother-to-child transmission and to facilitate early intervention if needed.

v. Prison Admissions: HIV testing is mandatory for individuals entering the prison system, aiming to manage and prevent the spread of HIV within correctional facilities.



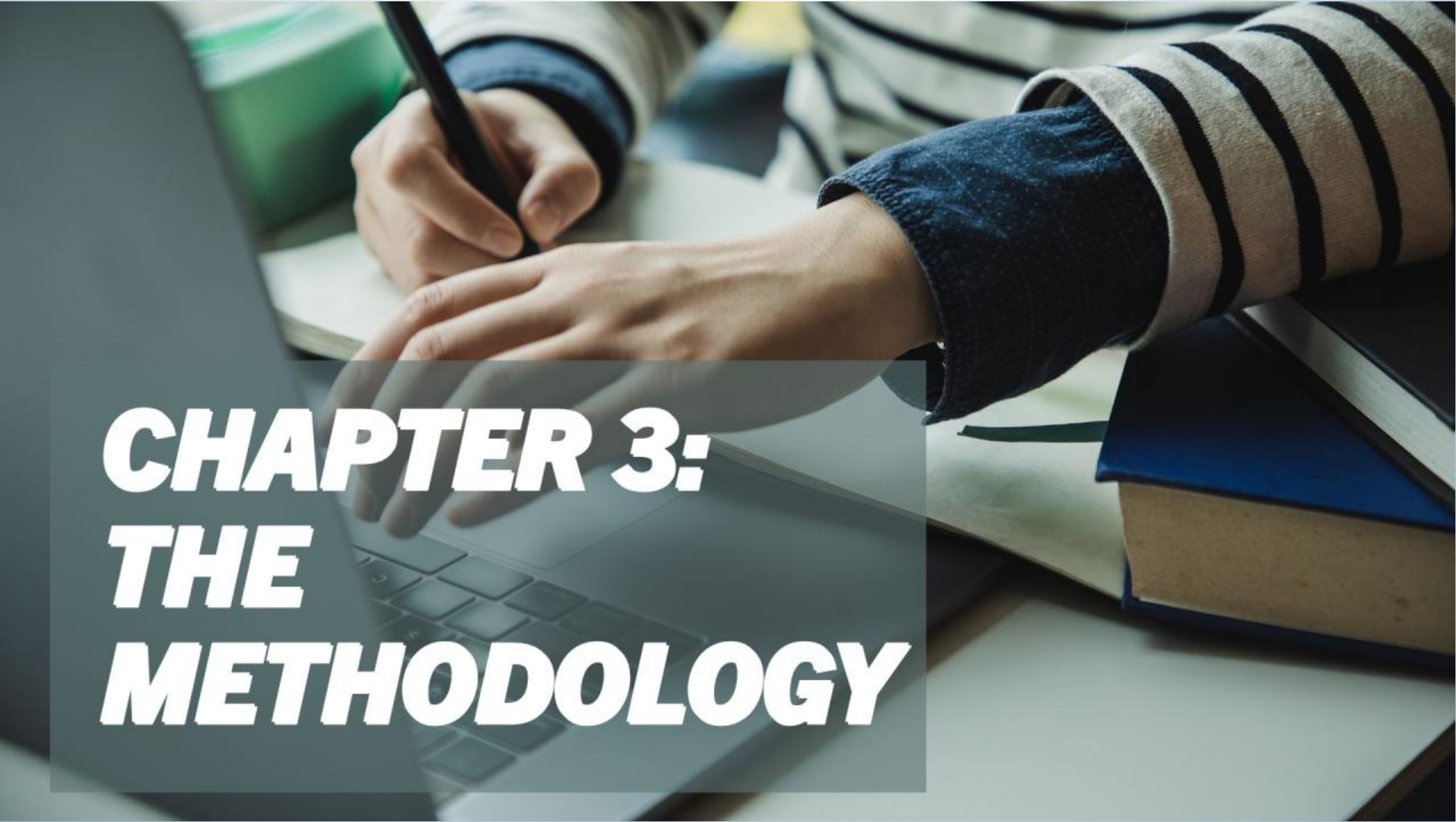
vi. Employment: Prospective employees must complete an HIV test before securing employment, helping to ensure workplace health and safety.



vii. Foreign Workers: Foreign nationals applying for work in Libya must undergo HIV testing as part of their work permit process, aligning with national health regulations.

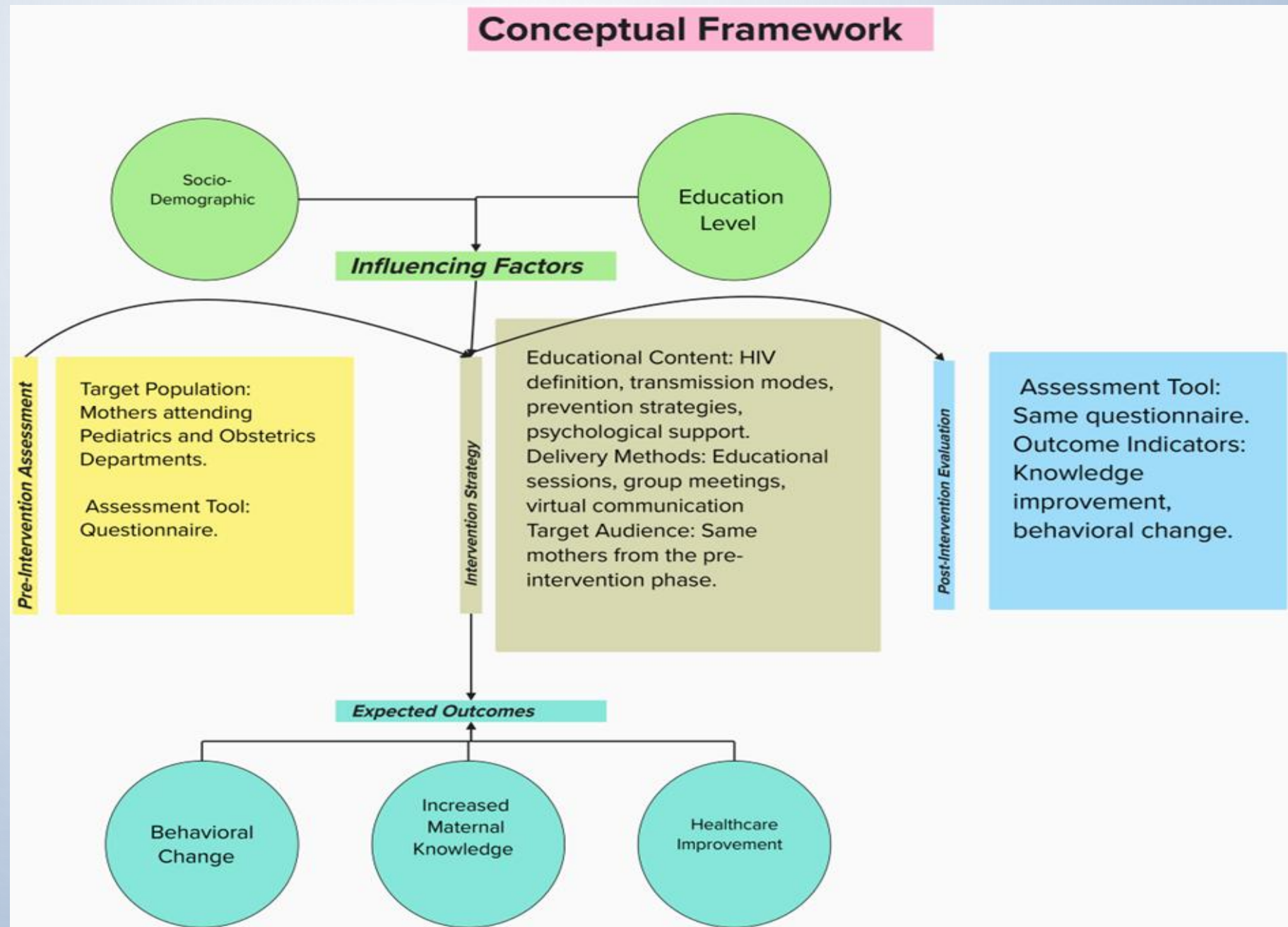


viii. Healthcare Worker Clearance: All healthcare workers are required to undergo HIV testing to protect both patients and staff, ensuring a safe healthcare environment.

A close-up photograph of a person's hands working at a desk. The person is wearing a blue and white striped long-sleeved shirt. Their right hand is holding a black pen and writing on a white notebook. Their left hand is resting on a laptop keyboard. To the right of the laptop, there is a stack of books, with the top one having a blue cover. The background is slightly blurred, showing more of the desk and the person's arm.

CHAPTER 3: THE METHODOLOGY

DIAGRAM OF
CONCEPTUAL
FRAMEWORK
(SELF-
DEVELOPED
MODEL)



SETTING

This study was conducted at the University Hospital in Tripoli, Libya

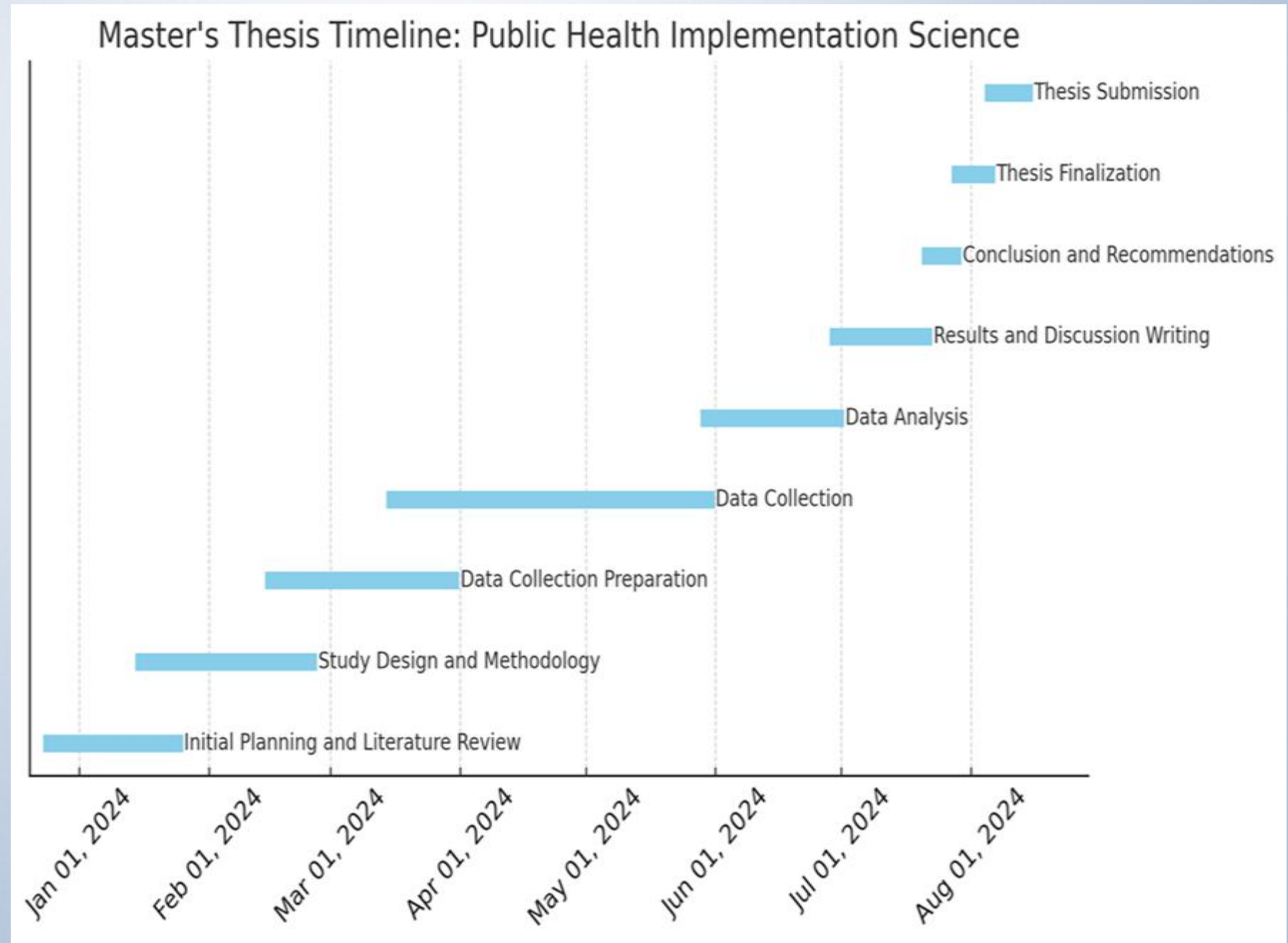
The University Hospital in Tripoli, Libya, formerly known as “Tripoli Medical Center (TMC)”, is one of the largest and most prominent healthcare institutions in the country. Established in the 1970s, it has served as a key medical facility in Libya, providing a wide range of healthcare services to the population.

Located in the capital city of Tripoli, the hospital is equipped with various specialized departments, including surgery, internal medicine, pediatrics, obstetrics and gynecology, and emergency care. It also hosts advanced diagnostic and treatment facilities, making it a central hub for medical care in the region.

In addition to its role as a healthcare provider, the hospital is affiliated with the University of Tripoli, serving as a primary teaching hospital for medical students, residents, and healthcare professionals. This academic connection enhances its role in medical education and research, contributing to the development of the healthcare sector in Libya.

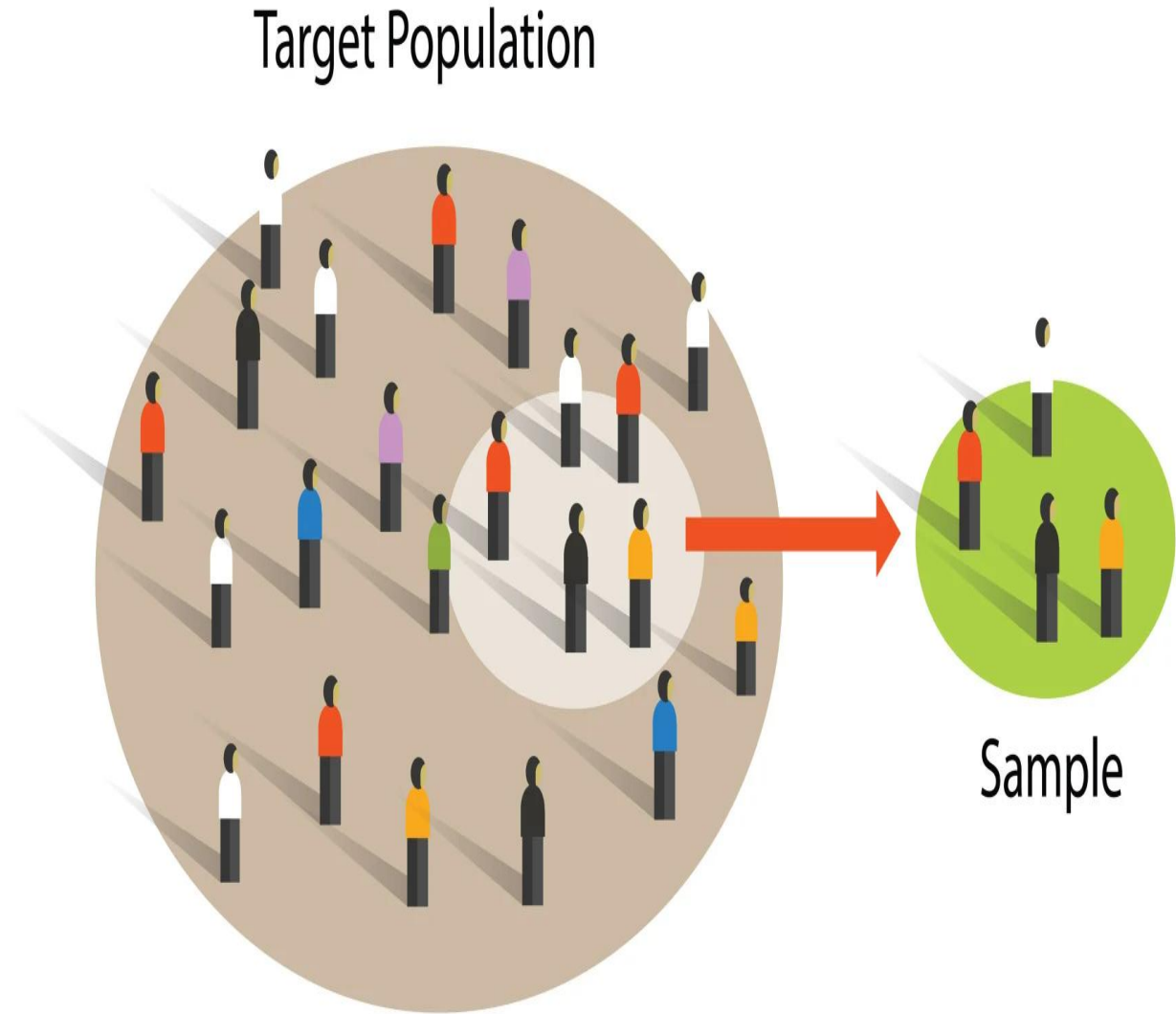
Over the years, the hospital has faced challenges, particularly due to the political instability and conflict in Libya. Despite these difficulties, it remains a crucial institution for healthcare delivery in the country, continuing to operate and serve patients under challenging circumstances. The hospital's commitment to providing medical care and training the next generation of healthcare professionals underscores its importance in Libya's healthcare landscape.

TIMELINE FOR THE STUDY.

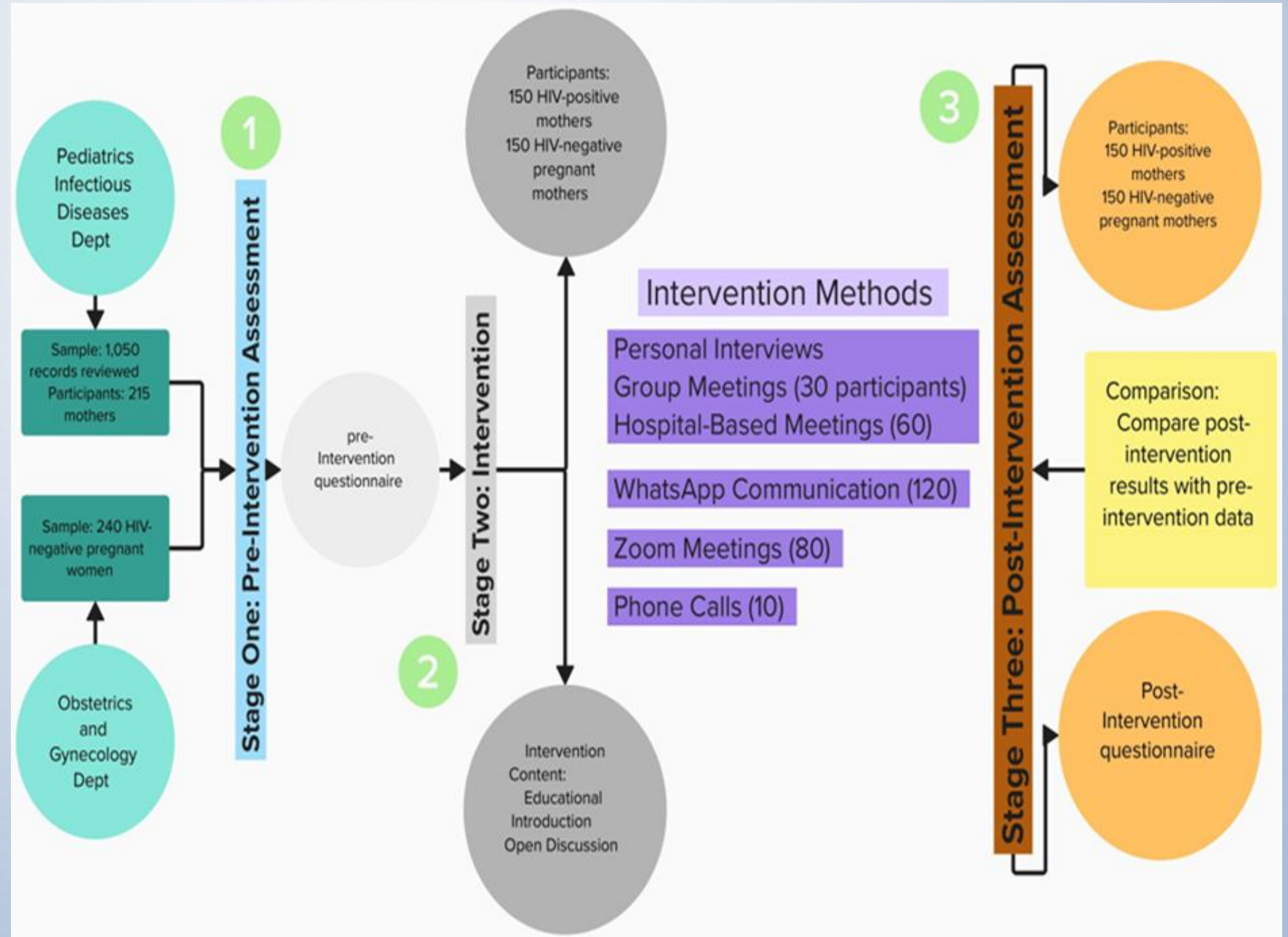


SAMPLE

- ALL AVAILABLE PREGNANT WOMEN WHO VISIT THE OBSTETRICS AND GYNECOLOGY DEPARTMENT AT THE UNIVERSITY HOSPITAL - TRIPOLI TO FOLLOW UP ON THEIR PREGNANCY, WOMEN WITH HIV INFECTION WHO VISIT THE INFECTIONS DISEASES DEPARTMENT AT UNIVERSITY HOSPITAL - TRIPOLI TO FOLLOW UP ON THEIR CONDITION, OR WOMEN WHO HAVE CHILDREN INFECTED WITH HIV AND ARE REGISTERED IN THE INFECTIONS DISEASES DEPARTMENT AT UNIVERSITY HOSPITAL - TRIPOLI WERE INCLUDED IN THIS STUDY

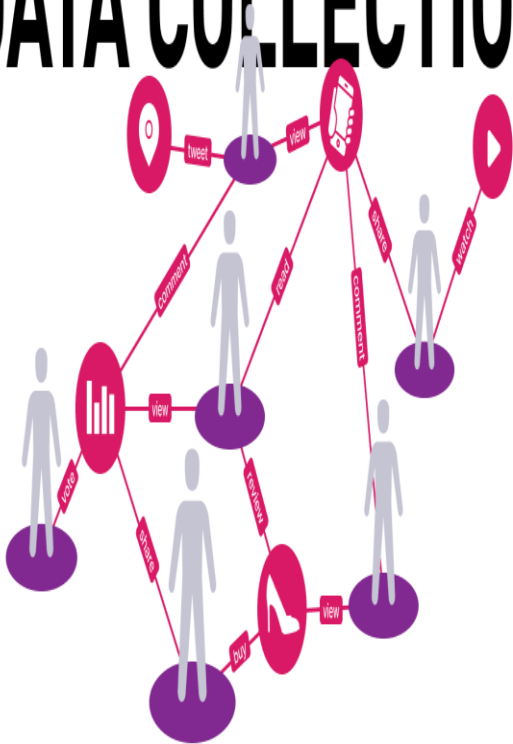


STUDY OVERVIEW AND STAGES



TOOLS OF DATA COLLECTION

DATA COLLECTION



- DATA WAS COLLECTED USING THE FOLLOWING:

STUDY DESIGN: PUBLIC HEALTH (OPERATIONS) RESEARCH- INTERVENTIONAL STUDY- PRETEST- POSTTEST DESIGN.

- O1 X O2

I. O1: A PRE-DESIGNED QUESTIONNAIRE DESIGNED AND WAS WRITTEN IN THE ARABIC LANGUAGE TO COLLECT DATA REGARDING THE FOLLOWING:

- CHARACTERISTICS OF THE STUDIED MOTHERS: AGE, EDUCATION, PREVIOUS PREGNANCY, ETC.
- MOTHER'S KNOWLEDGE RELATED TO HIV: THIS INCLUDES DEFINITION, CAUSES, CLINICAL MANIFESTATIONS, COMPLICATIONS, AND MANAGEMENT.

QUESTIONS WERE IN THE FORM OF MULTIPLE CHOICES. THE RESEARCHER'S TIME TO FILL IN THE QUESTIONNAIRE FOR EACH MOTHER WAS 15-20 MINUTES. EACH QUESTIONNAIRE SHEET WAS FILLED IN ON THE SPOT INDIVIDUALLY. THE TOTAL SCORE LEVEL FOR THE QUESTIONNAIRE SHEET WAS "100" MARKS.

THE MOTHER'S ANSWERS ARE CATEGORIZED AS FOLLOWS:

- A SCORE < 60 REFERRED TO UNSATISFACTORY KNOWLEDGE.
- A SCORE FROM 60 - 100 REFERRED TO SATISFACTORY KNOWLEDGE.

II. X: THE STUDY INTERVENTION INCLUDED A NEW TRAINING STRATEGY THAT FOCUSED ON BEHAVIORAL CHANGES AND INCLUDED THEORETICAL AND PRACTICAL TRAINING FOR THE MOTHER.

III. O2: POST-DESIGNED QUESTIONNAIRE ASSESSMENT OF MOTHERS' KNOWLEDGE AND SKILLS GAINED AFTER THE INTERVENTION.

STATISTICAL DESIGN

- DATA COLLECTED FROM THE STUDIED SAMPLE WAS REVISED, CODED, AND ENTIRE AND TABULATED USING PC. DATA ENTRY AND STATISTICAL ANALYSIS WERE FULFILLED USING THE STATISTICAL PACKAGE FOR SOCIAL SCIENCES (SPSS) VERSION 22.





Source of funding Personal by the investigator



Ethical considerations

All the included mothers were treated according to the Helsinki Declaration of Biomedical Ethics. Verbal consent from each mother was obtained after proper orientation of the mother regarding the study's objectives, the data confidentiality, and the impact of the study given according to their level of understanding, and physical and mental readiness to gain cooperation.

SOURCE OF FUNDING & ETHICAL CONSIDERATIONS

Chapter 4



RESULTS

- THE RESULTS OF THE STUDY WERE PRESENTED IN THE FOLLOWING PARTS:
 - I. PART I: CHARACTERISTICS OF THE STUDIED MOTHERS.
 - II. PART II: KNOWLEDGE OF THE STUDIED MOTHERS ABOUT THE PREVENTION OF HIV TRANSMISSION BETWEEN MOTHER AND NEWBORN IN TRIPOLI UNIVERSITY HOSPITAL.
 - III. PART III: RELATION BETWEEN STUDIED MOTHERS' CHARACTERISTICS AND THEIR KNOWLEDGE ABOUT THE PREVENTION OF HIV TRANSMISSION BETWEEN MOTHERS AND NEWBORNS IN TRIPOLI UNIVERSITY HOSPITAL.
 - IV. ASSESSMENT OF THE INTERVENTION PROGRAM'S EFFECT ON THE PREVENTION OF HIV TRANSMISSION BETWEEN MOTHER AND NEWBORN



A black and white photograph showing two hands, an adult's and a child's, cupped together in a protective gesture. The adult's hand is larger and positioned behind the child's hand, which is smaller and more delicate. The fingers are spread out, creating a bowl-like shape. The background is dark and out of focus.

**PART I:
CHARACTERISTICS
OF THE STUDIED
MOTHERS**

TABLE 1
NUMBER AND
PERCENTAGE
DISTRIBUTION
OF STUDIED
MOTHERS
ACCORDING
TO THEIR
CHARACTERISTI
CS (N=300)

Mother's Characteristics (n=300)					
	HIV (n=150)		Non-HIV (n=150)		Total % (N=300)
	Number	%	Number	%	
Age in years					
Below 20 Year	9	6%	21	4.6%	10%
20-30 Year	83	55.3%	73	48.6%	52%
30-40 Year	36	24%	41	27.3%	25.6%
Above 40 Year	22	14.6%	15	3.3%	12.3%
Level of education					
Illiterate	37	24.6%	1	0.6%	12.6%
Primary Education	31	20.6%	7	4.6%	12.6%
Moderate Education	64	42.6%	100	66.6%	54.6%
Highly Educated	18	12%	42	28%	20%
Working state					
Work	58	38.6%	112	74.6%	56.7%

TABLE 2
DISTRIBUTION
OF THE
STUDIED
MOTHERS
ACCORDING
TO THEIR
PREVIOUS
HISTORY OF
PREGNANCY
(N=300)

Previous history of pregnancy (n=300)					
	HIV (n=150)		non-HIV (n=150)		Total % (n=300)
	Number	%	Number	%	
Frequency of Pregnancies					
One	67	44.6%	12	8%	34.3%
Two	43	28.6%	51	34%	28.3%
Three	35	23.3%	65	42%	33.3%
Four and more	5	3.3%	22	14.6%	9.9%
Antenatal care					
Gets A.C	98	65.3%	144	96%	80.6%
Problems during pregnancy					
Suffered	119	79.3%	100	66.6%	73%
Previous children mortality					
Had	38	25.3%	7	4.6%	15%

TABLE 3
NUMBER AND
PERCENT
DISTRIBUTION
OF THE
PROBLEMS
DURING
FOLLOW-UP
ON ANTENATAL
CARE

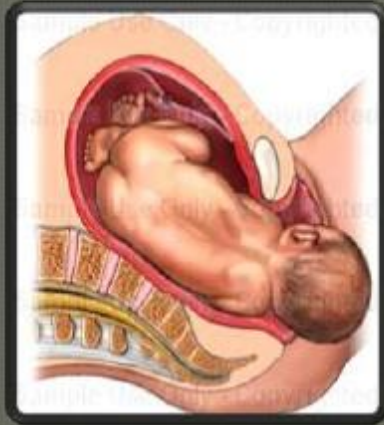
Problems during follow-up	HIV (n=150)		non-HIV (n=150)		Total % (n=300)
	Number	%	Number	%	
Diabetes	44	29.4%	32	21.4%	25.30%
Anemia	102	68%	110	73.4%	70.60%
High blood pressure	78	52%	56	37.4%	44.60%
Prepartum haemorrhage	14	9.4%	9	6%	7.60%
Preeclampsia	7	4.6%	2	1.4%	3%
Heavy vaginal discharge	99	66%	89	59.4%	62.60%
Cat disease	3	2%	0	0.0%	1%
Others	48	32%	23	15.4%	23.60%

**TABLE 4 NUMBER
AND
PERCENTAGE
DISTRIBUTION OF
THE STUDIED
MOTHERS
ACCORDING TO
THEIR CHILDREN`S
CHARACTERISTICS
(N=300)**

Children's Characteristics (n=300)					
	HIV (n=150)		non-HIV (n=150)		Total % (n=300)
	Number	%	Number	%	
Child ranking					
First	67	44.6%	12	8%	26.3%
Second	55	36.6%	13	8.6%	22.6%
Third	21	14%	89	59.4%	36.6%
Fourth or more	7	4.6%	36	24%	14.3%
Child caregivers					
Relatives	31	20.6%	46	30.6%	25.6%
Nursery school	24	16%	83	55.4%	35.6%
Mother herself	95	63.4%	21	14%	38.6%

Mother to child transmission

- Mothers with HIV can transmit virus to their infants during pregnancy, childbirth and breast feeding.



PART II: KNOWLEDGE OF THE
STUDIED MOTHERS ABOUT
PREVENTION OF HIV
TRANSMISSION BETWEEN
MOTHER AND NEWBORN IN
TRIPOLI UNIVERSITY HOSPITAL

TABLE 5 NUMBER
AND PERCENTAGE
DISTRIBUTION OF
STUDIED MOTHERS
ACCORDING TO
THEIR
KNOWLEDGE OF
PREVENTION OF
HIV
TRANSMISSION
(N=300)

KNOWLEDGE OF HIV TRANSMISSION (N=300)					
	HIV (n=150)		non-HIV (n=150)		Total %
	Number	%	Number	%	(n=300)
Definition of HIV Known	69	46%	63	42%	44%
Causes of HIV Known	99	66%	103	68.6%	67.3%
Signs and symptoms of HIV Known	81	54%	74	49.4%	51.6%
Early complications of HIV Known	101	67.4%	47	31.4%	49.3%

TABLE 6
CROSS-
TABULATION
"EDUCATION
LEVEL BY
KNOWLEDGE"

Education level by knowledge of prevention of HIV transmission (n=300)		
Definition of HIV Known		
Education Level	Number	Total %
Illiterate	17	5.7%
Primary Education	17	5.7%
Moderate Education	72	24%
Highly Educated	26	8.7%
Causes of HIV known		
Illiterate	26	8.7%
Primary Education	26	8.7%
Moderate Education	110	36.7%
Highly Educated	40	13.3%
Signs and Symptoms of HIV known		
Illiterate	20	6.7%
Primary Education	20	6.7%
Moderate Education	85	28.3%
Highly Educated	30	10%
Early Complications of HIV known		
Illiterate	19	6.3%
Primary Education	19	6.3%
Moderate Education	81	27%
Highly Educated	29	9.7%

TABLE 7 NUMBER
AND
PERCENTAGE
DISTRIBUTION OF
THE STUDIED
MOTHERS
ACCORDING TO
THEIR
KNOWLEDGE OF
SAMPLING OF
HIV (N=300)

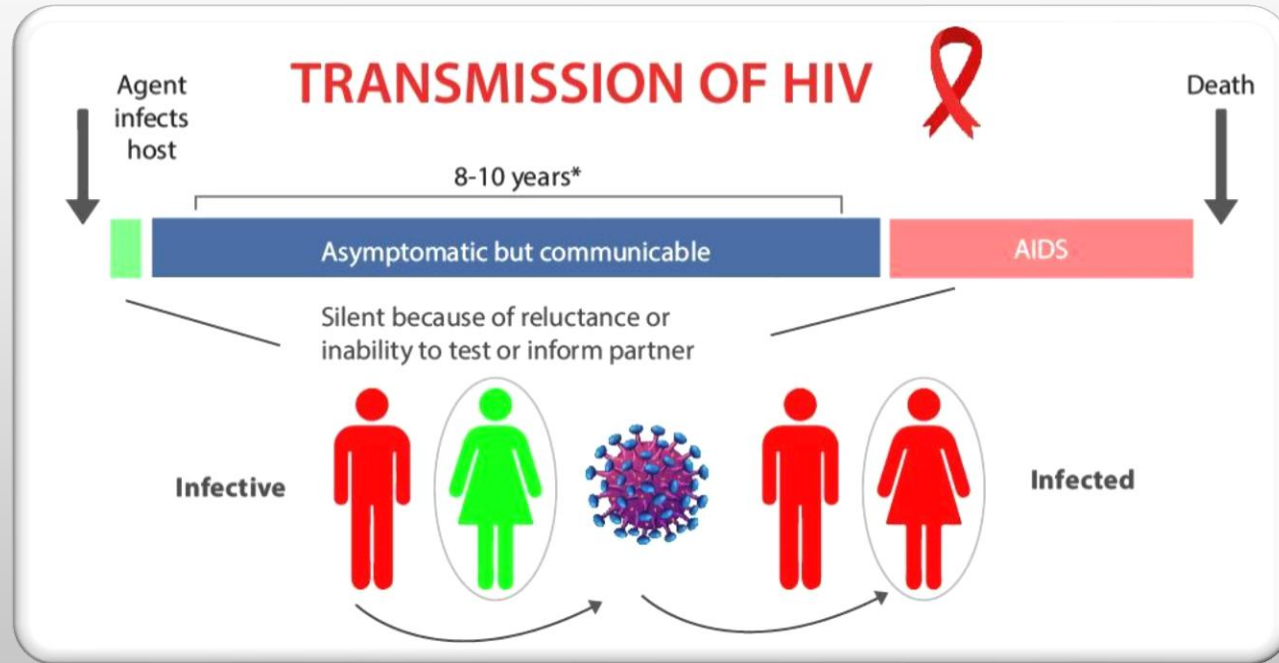
knowledge of sampling of HIV (n=300)					
Items	HIV (n=150)		non-HIV (n=150)		Total % (n=300)
	Number	%	Number	%	
Sampling Known	14	9.4%	21	14%	11.6%
Sampling important known	53	35.4%	69	46%	40.6%
Sampling time Known	32	21.4%	18	12%	16.6%
Methods of Investigations Known	100	66.6%	78	52%	59.3%
Follow up Known	87	58%	112	74.6%	66.3%

TABLE 8 NUMBER
AND PERCENTAGE
DISTRIBUTION OF
THE STUDIED
MOTHER
ACCORDING TO
THEIR
KNOWLEDGE OF
TREATMENT AND
PREVENTION
METHODS

Mother's knowledge	HIV (n=150)		non-HIV (n=150)		Total % (n=300)
	Number	%	Number	%	
Know about the treatment	144	96%	81	54%	75%
Know Prevention methods	115	76.6%	99	66%	71.3%

TABLE 9 NUMBER
AND
PERCENTAGE
DISTRIBUTION OF
THE STUDIED
MOTHERS
ACCORDING TO
THEIR TOTAL
KNOWLEDGE
LEVELS (N=300)

Total knowledge levels (n=300)					
Score of Knowledge					
	HIV (n=150)		non-HIV (n=150)		Total % (n=300)
	Number	%	Number	%	
Satisfy	91	60.6%	85	56.6%	58.70%



PART III: RELATION BETWEEN MOTHER'S CHARACTERISTICS AND THEIR KNOWLEDGE OF HIV

TABLE 10
RELATION
BETWEEN
MOTHERS' AGE
AND THEIR
KNOWLEDGE
OF HIV

Age	Knowledge				X2	P-value
	Satisfied		Unsatisfied			
	Total Number	Total %	Total Number	Total %	8.87	>0.032
<20years	20	6.60%	10	3.30%		
20-30 years	99	33%	57	19%		
30-40 years	42	14%	35	11.60%		
Above 40	15	5%	22	7.30%		

TABLE 11
RELATION
BETWEEN
MOTHERS' LEVEL
OF EDUCATION
AND THEIR
KNOWLEDGE IN
THE PREVENTION
OF HIV
TRANSMISSION
BETWEEN MOTHER
AND NEWBORN

Level of Education	Knowledge				X2	P- value
	Satisfy		Unsatisfied		63.3	**<0.0002
	Total Number	Total %	Total Number	Total %		
Illiterate	8	2.60%	30	10%		
Read and write	12	4%	26	8.60%		
Moderate Education	101	33.6	63	21%		
Highly education	55	10%	5	1.60%		

TABLE 12
RELATION
BETWEEN
MOTHERS'
WORKING STATE
AND THEIR
KNOWLEDGE IN
THE PREVENTION
OF HIV
TRANSMISSION
BETWEEN MOTHER
AND NEWBORN

Working State	knowledge				X2	P-value
	Satisfied		Unsatisfied		29.4	<0.0001
	Total Number	Total %	Total Number	Total %		
Working	123	41%	47	15.6%		

**TABLE 13 RELATION
BETWEEN MOTHERS'
KNOWLEDGE IN THE
PREVENTION OF HIV
TRANSMISSION
BETWEEN MOTHER
AND NEWBORN
AND THEIR PREVIOUS
PREGNANCIES**

Items	Knowledge				X2	P-value
	Satisfy		Unsatisfied		12.5	<0.014
	Total Number	Total %	Total Number	Total %		
Pregnancy frequency						
One	45	15%	34	11.3%		
Two	54	18%	40	13.3%		
Three	68	22.6%	32	10.6%		
Four or more	9	3%	18	6%		
Antenatal care						
Yes	154	51.3%	88	29.3%		
No	22	7.3%	36	12%		
Problem during pregnancy					6.37	*<0.012
Yes	138	46%	81	27%		
No	38	12.6%	43	14.3%		

TABLE 14 RELATION
BETWEEN MOTHERS'
KNOWLEDGE IN THE
PREVENTION OF HIV
TRANSMISSION
BETWEEN MOTHER
AND NEWBORN
AND PREVIOUS
CHILDREN'S
MORTALITY

Items	Knowledge				X2	P-value
	Satisfied		Unsatisfied			
	Total Number	Total %	Total Number	Total %		
Previous children mortality					2.08	0.149
Yes	22	7.3%	23	7.6%		



Protect your own health
and **lower your risk** of
passing HIV to your baby
by taking HIV meds.

TABLE 15
KNOWLEDGE
PERCENT
SCORES IN THE
PRETEST AND
POST-TEST
AMONG THE
FOCUSED
GROUP

Knowledge items	Pre-test (P1)				Post-test (P3)				P values	
	HIV		non-HIV		HIV		non-HIV			
	Median	IQR	Median	IQR	Median	IQR	Median	IQR	P1	P3
Definition of HIV	68.1	(36.4-100)	75	(50.2-100)	99	(98-100)	89	(75.0-100)	<0.04	0.001
Causes of HIV	43.8	(12.4-100)	67	(34.3-100)	98	(96-100)	92.1	(76.9-100)	<0.03	0.002
Signs and symptoms of HIV	46.2	(25.8-66.6)	33.3	(12.3-66.6)	66.6	(33.6-100)	76	(66.6-100)	<0.007	0.03
Early complications of HIV	70.1	(40.2-77)	55.2	(10.0-65)	80	(60.0-80)	80	(60.0-80)	<0.05	0.009
Methods of investigations	66.6	(33.2-100)	74	(48.6-100)	96.9	(66.6-100)	91.4	(66.6-100)	<0.009	0.06

TABLE 16
COMPARISON
OF TOTAL
KNOWLEDGE
PRE-
INTERVENTION
AND POST-
INTERVENTION
AMONG (HIV
AND NON-HIV)

HIV Status	Total Knowledge (Pre-Intervention)	Total Knowledge (Post-Intervention)	% Change
HIV- Negative (non-HIV)	Mean: 53.2 ± SD: 2.8	Mean: 76.1 ± SD: 9.3	43.05%
HIV- Positive (HIV)	Mean: 44.2 ± SD: 2.1	Mean: 66.4 ± SD: 11.3	50.23%



CONTEXT ANALYSIS

The political and economic instability in Libya has had a profound impact on the health sector, particularly concerning HIV/AIDS prevention and treatment. The ongoing conflict has led to the disruption of healthcare services, shortages of essential medicines, and a breakdown in the healthcare infrastructure. This environment has exacerbated the challenges faced by HIV patients, including stigmatization, inadequate access to antiretroviral therapy (ART), and limited public health awareness.

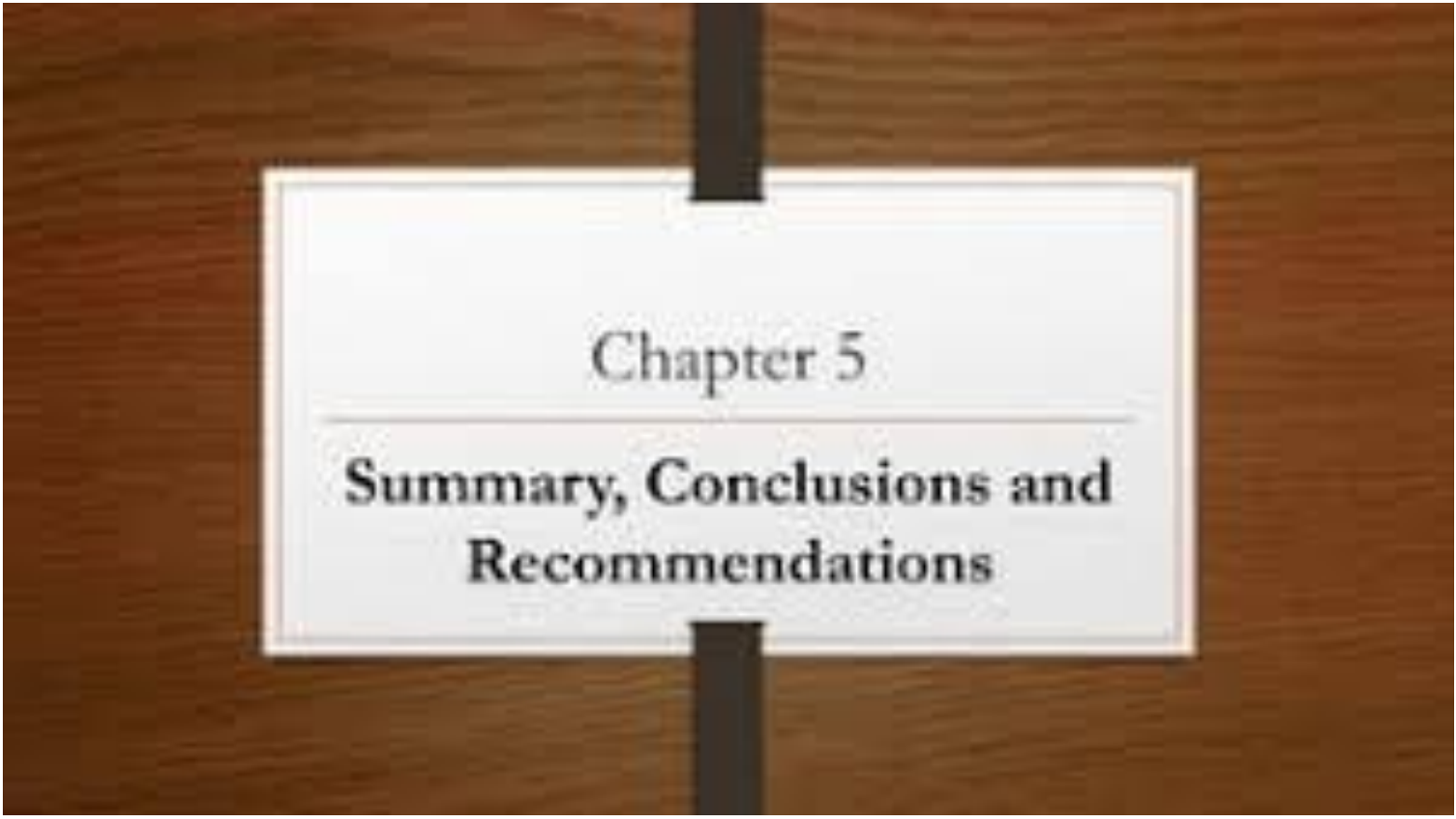
Stigma remains a significant barrier to accessing HIV services. Fear of discrimination prevents many individuals from seeking testing, treatment, and counseling. The lack of resources and trained healthcare professionals further complicates the situation, leading to insufficient care for pregnant women and inadequate prevention of mother-to-child transmission (PMTCT) of HIV.

Drug abuse and the spread of sexually transmitted infections (STIs) are also critical issues in Libya, contributing to the increasing HIV prevalence. The migration and displacement of populations due to conflict have disrupted social and healthcare networks, making it difficult to reach vulnerable groups with necessary interventions.

STAKEHOLDER MAPPING



stakeholder	Role	Interest	Influence Level
Ministry of Health (Libya)	Policymaking, regulation, and oversight of healthcare services.	Ensuring effective HIV prevention and improving maternal and child health.	High
Tripoli University Hospital	Primary healthcare provider for the study's subjects.	Improving patient outcomes, particularly in HIV-related care.	High
Healthcare Professionals	Providers of care, education, and support to patients.	Enhancing capacity to prevent and manage HIV transmission.	Medium
Non-Governmental Organizations (NGOs)	Support and advocacy for HIV patients, providing resources, education, and outreach.	Reducing stigma, improving access to treatment, and supporting vulnerable populations.	Medium to High
International Health Organizations (WHO, UNICEF, UNAIDS)	Provide guidelines, funding, and technical assistance.	Achieving global health goals, such as reducing mother-to-child HIV transmission.	High
Patients and Their Families	Beneficiaries of healthcare services.	Access to quality care, reduction of stigma, and health protection.	Low
Community Leaders and Religious Figures	Influence community norms and attitudes.	Promoting health within cultural and religious frameworks.	Medium to High



Chapter 5

Summary, Conclusions and Recommendations



DISCUSSION

- THIS STUDY AIMED TO ASSESS THE KNOWLEDGE AND AWARENESS OF HIV TRANSMISSION PREVENTION BETWEEN MOTHERS AND NEWBORNS AT TRIPOLI UNIVERSITY HOSPITAL IN LIBYA. THE FINDINGS PROVIDE VALUABLE INSIGHTS INTO THE CURRENT STATE OF MATERNAL KNOWLEDGE ON THIS CRITICAL PUBLIC HEALTH ISSUE AND HIGHLIGHT THE EFFECTIVENESS OF TARGETED INTERVENTIONS. ADDITIONALLY, THE RESULTS OF THIS STUDY ALIGN WITH AND EXPAND UPON FINDINGS FROM PREVIOUS RESEARCH CONDUCTED IN SIMILAR CONTEXTS, EMPHASIZING THE GLOBAL IMPORTANCE OF MATERNAL EDUCATION IN PREVENTING MOTHER-TO-CHILD TRANSMISSION (MTCT) OF HIV

CHARACTERISTICS OF THE STUDIED MOTHERS

- THE DEMOGRAPHIC PROFILE OF THE MOTHERS IN THIS STUDY REVEALED THAT THE MAJORITY WERE BETWEEN 20-30 YEARS OLD, WITH A MODERATE LEVEL OF EDUCATION. THIS AGE GROUP ALSO SHOWED THE HIGHEST LEVEL OF AWARENESS REGARDING HIV TRANSMISSION PREVENTION. SIMILAR FINDINGS HAVE BEEN REPORTED IN STUDIES CONDUCTED IN OTHER LOW- AND MIDDLE-INCOME COUNTRIES. FOR INSTANCE, A STUDY CONDUCTED IN ETHIOPIA BY ABTEW ET AL. (2016) FOUND THAT YOUNGER MOTHERS WITH HIGHER LEVELS OF EDUCATION WERE MORE LIKELY TO HAVE ACCURATE KNOWLEDGE ABOUT HIV TRANSMISSION AND PREVENTION STRATEGIES. THIS SUGGESTS A CONSISTENT TREND ACROSS DIFFERENT REGIONS, WHERE EDUCATIONAL ATTAINMENT PLAYS A CRUCIAL ROLE IN ENHANCING HEALTH LITERACY AMONG MOTHERS.

SHARE THE FACTS ABOUT HIV

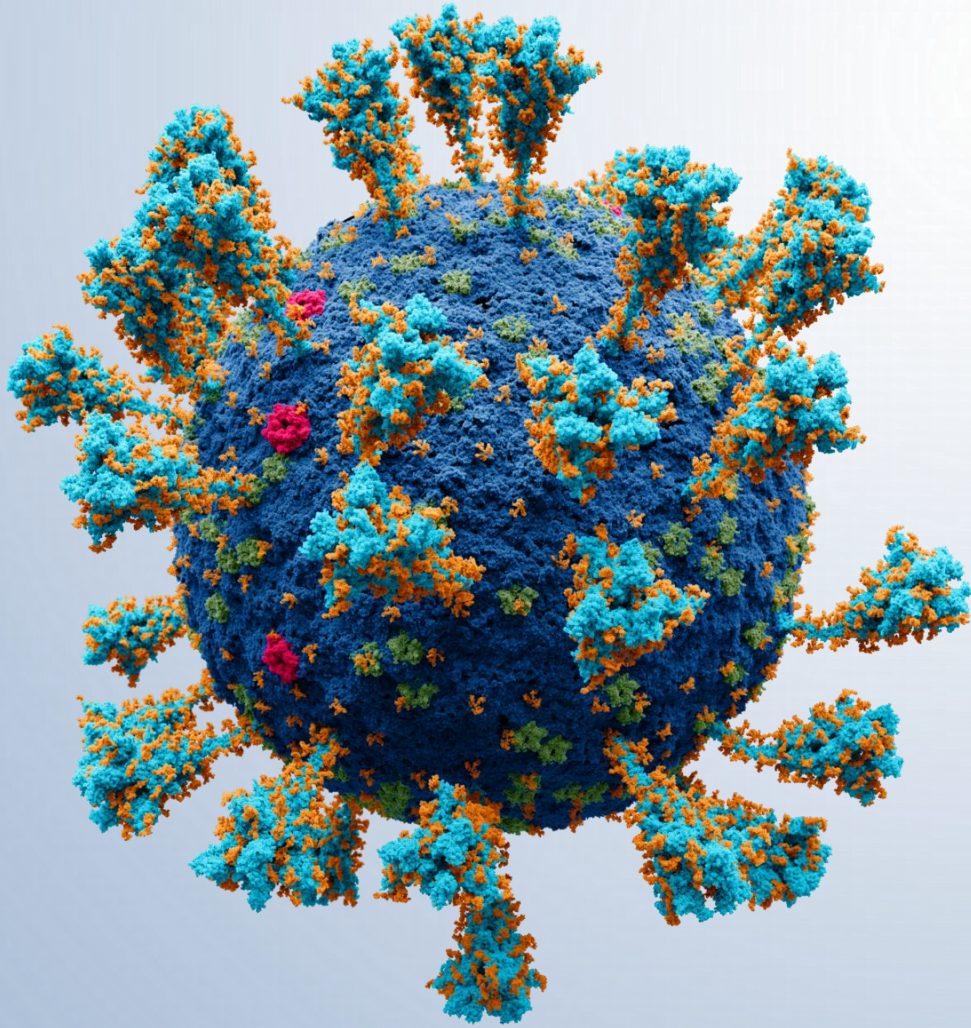
Talk about testing, prevention, and treatment. Information helps stop stigma.

You can make a difference.



KNOWLEDGE OF HIV TRANSMISSION PREVENTION

- THE STUDY FOUND THAT MORE THAN HALF OF THE MOTHERS LACKED A BASIC UNDERSTANDING OF HIV, WITH 56% UNAWARE OF THE DEFINITION OF THE VIRUS. THIS FINDING IS CONSISTENT WITH RESEARCH CONDUCTED IN OTHER PARTS OF AFRICA. FOR EXAMPLE, A STUDY IN NIGERIA BY IJADUNOLA ET AL. (2017) REPORTED THAT A SIGNIFICANT PROPORTION OF PREGNANT WOMEN LACKED ADEQUATE KNOWLEDGE ABOUT HIV AND ITS TRANSMISSION, WHICH COULD IMPEDE EFFORTS TO PREVENT MTCT. MOREOVER, THE STUDY HIGHLIGHTED GAPS IN AWARENESS REGARDING THE SYMPTOMS AND EARLY COMPLICATIONS OF HIV, A CONCERN ALSO NOTED IN RESEARCH CONDUCTED IN TANZANIA BY MSUYA ET AL. (2018). THE TANZANIAN STUDY EMPHASIZED THE NEED FOR COMPREHENSIVE EDUCATION ON THE CLINICAL ASPECTS OF HIV, AS UNDERSTANDING SYMPTOMS AND COMPLICATIONS IS ESSENTIAL FOR EARLY DETECTION AND MANAGEMENT.



RELATION BETWEEN MOTHERS' CHARACTERISTICS AND KNOWLEDGE

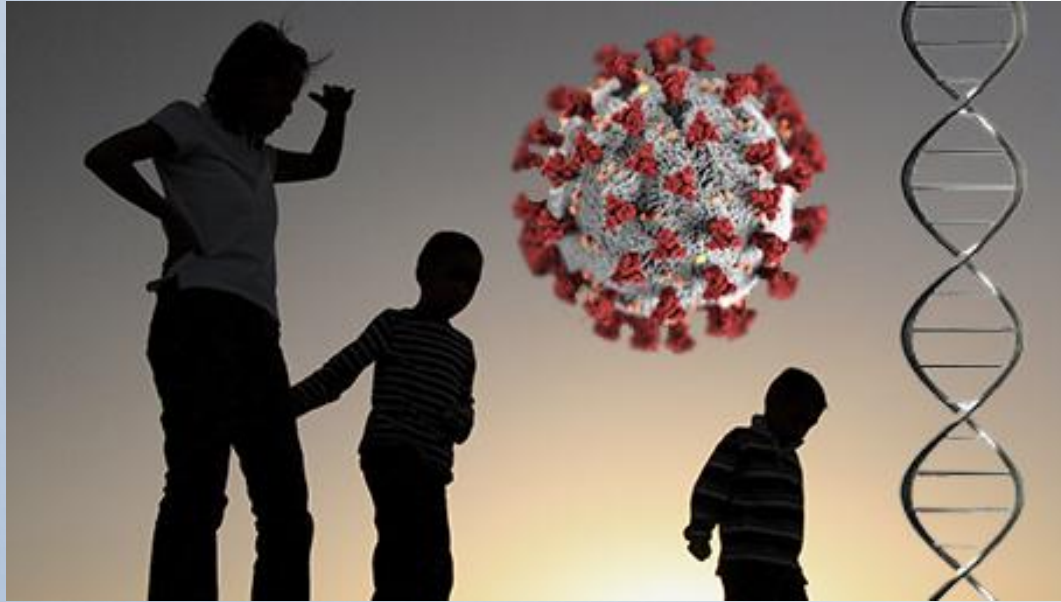
- A SIGNIFICANT RELATIONSHIP WAS FOUND BETWEEN THE MOTHERS' AGE, EDUCATION LEVEL, AND WORKING STATUS WITH THEIR KNOWLEDGE ABOUT HIV TRANSMISSION. YOUNGER MOTHERS (20-30 YEARS) WITH MODERATE EDUCATION LEVELS EXHIBITED THE HIGHEST LEVELS OF KNOWLEDGE, WHILE THOSE WHO WERE ILLITERATE OR HAD ONLY PRIMARY EDUCATION WERE LESS INFORMED. THIS FINDING IS SUPPORTED BY A STUDY CONDUCTED IN SOUTH AFRICA BY PELTZER ET AL. (2015), WHICH FOUND THAT MATERNAL KNOWLEDGE ABOUT HIV WAS STRONGLY ASSOCIATED WITH HIGHER LEVELS OF EDUCATION AND EMPLOYMENT STATUS. THE SOUTH AFRICAN STUDY ALSO HIGHLIGHTED THE ROLE OF SOCIOECONOMIC FACTORS IN SHAPING HEALTH KNOWLEDGE, UNDERSCORING THE NEED FOR PUBLIC HEALTH INTERVENTIONS TO ADDRESS THESE DISPARITIES.

EFFECTIVENESS OF THE INTERVENTION PROGRAM



- THE INTERVENTION PROGRAM DEMONSTRATED A SIGNIFICANT IMPROVEMENT IN THE MOTHERS' KNOWLEDGE ABOUT HIV TRANSMISSION PREVENTION. THE POST-INTERVENTION ASSESSMENTS REVEALED SUBSTANTIAL GAINS IN UNDERSTANDING, PARTICULARLY IN DEFINING HIV, RECOGNIZING ITS CAUSES, AND UNDERSTANDING THE IMPORTANCE OF EARLY DIAGNOSIS AND FOLLOW-UP CARE. THIS ALIGNS WITH FINDINGS FROM A STUDY CONDUCTED IN UGANDA BY BAJUNIRWE AND MUZOORA (2005), WHERE AN EDUCATIONAL INTERVENTION SIGNIFICANTLY INCREASED THE KNOWLEDGE OF HIV AMONG PREGNANT WOMEN, LEADING TO IMPROVED HEALTH-SEEKING BEHAVIORS AND A REDUCTION IN MTCT RATES. THE SUCCESS OF THE INTERVENTION IN THIS STUDY FURTHER VALIDATES THE EFFECTIVENESS OF TARGETED EDUCATIONAL PROGRAMS IN ENHANCING MATERNAL KNOWLEDGE AND REDUCING THE RISK OF HIV TRANSMISSION TO NEWBORNS.

IMPLICATIONS FOR PUBLIC HEALTH PRACTICE



- THE FINDINGS OF THIS STUDY HAVE IMPORTANT IMPLICATIONS FOR PUBLIC HEALTH STRATEGIES AIMED AT REDUCING THE MTCT OF HIV IN LIBYA. THE CLEAR ASSOCIATION BETWEEN EDUCATION, EMPLOYMENT, AND HIV KNOWLEDGE UNDERSCORES THE NEED FOR TARGETED EDUCATIONAL PROGRAMS THAT CATER TO THE MOST VULNERABLE GROUPS, PARTICULARLY YOUNGER AND LESS EDUCATED MOTHERS. THE CONSISTENCY OF THESE FINDINGS WITH PREVIOUS STUDIES CONDUCTED IN OTHER REGIONS HIGHLIGHTS THE UNIVERSAL IMPORTANCE OF MATERNAL EDUCATION IN PREVENTING MTCT. FURTHERMORE, THE SUCCESS OF THE INTERVENTION PROGRAM SUGGESTS THAT SIMILAR APPROACHES COULD BE SCALED UP ACROSS OTHER REGIONS TO ENHANCE MATERNAL KNOWLEDGE AND REDUCE THE RISK OF HIV TRANSMISSION TO NEWBORNS.

**DON'T LIMIT YOUR
CHALLENGES
CHALLENGE
YOUR LIMITS**

CHALLENGES AND LIMITATIONS

- DESPITE THE POSITIVE OUTCOMES, THE STUDY FACED SEVERAL CHALLENGES. THE ONGOING POLITICAL INSTABILITY IN LIBYA HAS SEVERELY IMPACTED THE HEALTHCARE INFRASTRUCTURE, MAKING IT DIFFICULT TO REACH ALL POTENTIAL PARTICIPANTS AND DELIVER CONSISTENT INTERVENTIONS. ADDITIONALLY, THE STIGMA ASSOCIATED WITH HIV REMAINS A SIGNIFICANT BARRIER TO ACCESSING HEALTHCARE SERVICES, WHICH MAY HAVE INFLUENCED THE WILLINGNESS OF SOME MOTHERS TO PARTICIPATE FULLY IN THE STUDY. SIMILAR CHALLENGES WERE REPORTED IN A STUDY CONDUCTED IN KENYA BY WEKESA AND COAST (2014), WHICH FOUND THAT STIGMA AND HEALTHCARE ACCESS ISSUES SIGNIFICANTLY HINDERED THE EFFECTIVENESS OF HIV PREVENTION PROGRAMS. FUTURE PROGRAMS SHOULD CONSIDER THESE CHALLENGES AND WORK TOWARDS CREATING A MORE SUPPORTIVE ENVIRONMENT FOR MOTHERS AFFECTED BY OR AT RISK OF HIV.

Conclusion

A magnifying glass with a black handle and a silver rim is positioned over the word 'Conclusion'. The lens of the magnifying glass is centered over the letters 'clu', making them appear larger and more prominent than the rest of the word. The background is a plain, light-colored surface.

THIS STUDY UNDERSCORES THE CRITICAL NEED FOR IMPROVED HEALTH EDUCATION AMONG MOTHERS IN LIBYA, PARTICULARLY IN THE CONTEXT OF HIV TRANSMISSION PREVENTION. THE FINDINGS SUGGEST THAT TARGETED EDUCATIONAL INTERVENTIONS CAN SIGNIFICANTLY ENHANCE MATERNAL KNOWLEDGE AND CONTRIBUTE TO THE REDUCTION OF MTCT OF HIV. THE CONSISTENCY OF THESE FINDINGS WITH PREVIOUS RESEARCH CONDUCTED IN OTHER REGIONS EMPHASIZES THE GLOBAL IMPORTANCE OF MATERNAL EDUCATION IN PREVENTING HIV TRANSMISSION. PUBLIC HEALTH EFFORTS SHOULD CONTINUE TO FOCUS ON INCREASING AWARENESS AND PROVIDING ACCESSIBLE INFORMATION TO ALL MOTHERS, WITH PARTICULAR ATTENTION TO THOSE IN LOWER SOCIOECONOMIC GROUPS. BY ADDRESSING THESE KNOWLEDGE GAPS, LIBYA CAN MAKE SIGNIFICANT STRIDES IN CONTROLLING THE HIV EPIDEMIC AND IMPROVING MATERNAL AND CHILD HEALTH OUTCOMES.

Recommendations



- BASED ON THE FINDINGS OF THE CURRENT STUDY, THE FOLLOWING RECOMMENDATIONS ARE SUGGESTED:

1) STRENGTHEN HIV EDUCATION AND AWARENESS PROGRAMS:

- DEVELOP AND IMPLEMENT TARGETED EDUCATIONAL PROGRAMS THAT FOCUS ON THE CAUSES, SYMPTOMS, AND PREVENTION METHODS OF HIV, TAILORED TO DIFFERENT EDUCATIONAL LEVELS.
- INCORPORATE PRACTICAL TRAINING SESSIONS WITHIN ANTENATAL CARE VISITS TO ENSURE MOTHERS UNDERSTAND HOW TO PREVENT HIV TRANSMISSION EFFECTIVELY.

2) SUPPORT FOR WORKING MOTHERS:

- COLLABORATE WITH WORKPLACES TO INTEGRATE HIV PREVENTION EDUCATION INTO THEIR HEALTH PROGRAMS, REACHING MOTHERS WHO MIGHT OTHERWISE MISS OUT DUE TO WORK COMMITMENTS.
- PROVIDE FLEXIBLE SCHEDULING OPTIONS FOR WORKING MOTHERS TO ATTEND EDUCATIONAL SESSIONS AND ANTENATAL CARE APPOINTMENTS.

3) FOCUS ON EARLY CHILDHOOD CARE:

- OFFER TRAINING FOR CAREGIVERS WHO ARE RESPONSIBLE FOR CHILDREN, INCLUDING RELATIVES AND NURSERY SCHOOL STAFF, TO PREVENT HIV TRANSMISSION AND ENSURE BETTER CARE PRACTICES.

4) ADDRESS KNOWLEDGE GAPS IN HIV SAMPLING AND DIAGNOSIS:

- LAUNCH AWARENESS CAMPAIGNS SPECIFICALLY ADDRESSING THE IMPORTANCE OF HIV SAMPLING, THE METHODS USED FOR DIAGNOSIS, AND THE FOLLOW-UP PROCEDURES.

5) DEVELOP EDUCATIONAL MATERIALS:

- CREATE EDUCATIONAL MATERIALS TAILORED TO DIFFERENT EDUCATION LEVELS, INCLUDING PAMPHLETS, POSTERS, AND DIGITAL RESOURCES THAT ARE EASY TO UNDERSTAND AND WIDELY ACCESSIBLE.
- DISTRIBUTE THESE MATERIALS THROUGH COMMUNITY CENTERS, HEALTHCARE FACILITIES, AND ONLINE PLATFORMS TO REACH A BROADER AUDIENCE.

6) CONDUCT FURTHER RESEARCH:

- CONDUCT LARGER STUDIES TO GENERALIZE THE FINDINGS AND GAIN A MORE COMPREHENSIVE UNDERSTANDING OF THE FACTORS INFLUENCING HIV KNOWLEDGE AND PREVENTION PRACTICES AMONG MOTHERS IN LIBYA.
- EXPLORE THE LONG-TERM IMPACT OF THE INTERVENTION PROGRAM ON HIV TRANSMISSION RATES AND MATERNAL AND CHILD HEALTH OUTCOMES.

7) LIMITATIONS AND CONSIDERATIONS:

- GENERALIZABILITY: THE FINDINGS OF THIS STUDY MAY NOT BE FULLY GENERALIZABLE TO OTHER POPULATIONS OR REGIONS WITH DIFFERENT CULTURAL, SOCIAL, AND ECONOMIC CONTEXTS. FURTHER RESEARCH IS NEEDED TO ASSESS THE APPLICABILITY OF THESE RECOMMENDATIONS IN DIVERSE SETTINGS
- . SAMPLE SIZE: WHILE THE STUDY INCLUDED A REASONABLE SAMPLE SIZE, A LARGER STUDY COULD PROVIDE MORE ROBUST EVIDENCE AND ENHANCE THE GENERALIZABILITY OF THE FINDINGS.
- STUDY DESIGN: THE STUDY DESIGN COULD BE STRENGTHENED BY INCORPORATING A CONTROL GROUP TO ISOLATE THE SPECIFIC IMPACT OF THE INTERVENTION PROGRAM.

Acknowledgment



I would like to express my profound gratitude to all those who have contributed to the completion of this thesis. First, I sincerely thank my supervisor, Dr. Neetu Purohit, for her continuous support, valuable insights, and unwavering guidance throughout this research. Her expertise and dedication were instrumental in shaping this work.



I am also deeply thankful to Dr. Monira Ali Dakheel, whose encouragement and thoughtful feedback have been invaluable. Her commitment to public health has been a source of inspiration throughout this journey.



Special thanks to the staff and patients of Tripoli University Hospital, their cooperation and willingness to participate in this study were essential to its success.



Furthermore, I am grateful to my family and friends for their unwavering support, understanding, and encouragement throughout this challenging process. Their patience and belief in me have been my strength.



Finally, A special acknowledgment is extended to IIHMR University and TDR for providing me with the academic foundation and resources necessary to pursue this research. The knowledge and skills I acquired during my time at IIHMR University have been crucial in conducting this study.

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DR. AKRAM R. ALHIBEESHI

MPH-IS

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