

**The Role of the Internet in Providing Reproductive Health Information to Female
Youths in the Middle East**

by

Fattaneh Pahlavan

MSc, Midwifery, Tarbiat Modares University, Iran, 2017

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We acknowledge and respect the Lək'wəḡən (Songhees and Xwəpsəm/Esquimalt) Peoples on
whose territory the university stands, and the Lək'wəḡən and W̱SÁNEĆ Peoples whose
historical relationships with the land continue to this day.

Supervisory Committee

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Supervisory Committee

Dr. Doris Kakuru (School of Child and Youth Care)

Supervisor

Dr. Jennifer White (School of Child and Youth Care)

Co-Supervisor

Abstract

This systematic review aims to identify the role of the Internet in providing reproductive health information to female youths in the Middle East, utilizing the “Cyberfeminism” framework and the Transtheoretical model of change. I imported 27 eligible studies (from 2005 to 2024) into the Covidence platform, extracted data, and analyzed them using Reflexive Thematic Analysis.

My research questions are as follows: How does the Internet affect female youths’ access to reproductive health information in the Middle East? What are the internet-related barriers to female youths’ access to reproductive health information? How can female youths’ access to reproductive health information be improved? I found some themes that helped me to answer research questions: The first theme was “The effect of the Internet on access to reproductive health”. It shows that the Internet and social media are useful tools for providing female youths with reproductive health services and information in the Middle East. However, I found other themes as barriers that prevent female youths from accessing reproductive health information using the Internet and social media, including trust issues, technical barriers, governments, and low digital literacy. Based on my findings, accessible resources and a safe online space, education, high digital literacy, and female youths’ empowerment would be facilitators that could help female youths access reproductive health information in the Middle East. In conclusion, the Internet and social media positively affect female youths’ reproductive health information in the Middle East. While some barriers prevent female youths from accessing that information, we can utilize facilitators to enhance their reproductive health information using the Internet and social media.

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Chapter 1- Introduction

This research endeavor aims to identify the role of the Internet in providing reproductive health information to female youths in the Middle East. Youth is defined as a period of transition from childhood to adolescence, ranging from 15 to 24 years old (Ninsiima et al., 2021; United Nations, 1985, para. 1). They are sexually active and make up a large portion of the population (Uka et al., 2024). Early sexual activity is a social and public health issue, especially in low-and middle-income countries, and increases the risk of unexpected pregnancy and Sexually Transmitted Diseases (STDs) among female youths (Ferede et al., 2023). Hence, we should help them understand and access their reproductive health rights. In this thesis, the study population was cisgender females, ranging from 14 to 24 years old.

The term reproductive health has been defined by the World Health Organization (WHO) as “a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity, in all matters relating to the reproductive system and its functions and processes.” (World Health Organization, 2022, para. 1). The main concepts of reproductive health rights are as follows: being able to build a family and have a satisfying and safe relationship without any discrimination or violence, choosing to get married or not, having access to family planning services, making decisions about childbearing, having sex without any discrimination or violence, and having access to health information and education (World Health Organization, 2018).

Reproductive health rights are for all people worldwide (Fathalla et al., 2006). In this sense, the United Nations (UN) has proposed a new joint UN Statement last year, emphasizing the global effort to help everybody access reproductive health rights and services (United Nations, 2024). However, female youths do not have access to reproductive health services and information in some regions of the world, such as the Global South (Griffin, 2006). For example, a recent study shows that there is a lack of sufficient sexual and reproductive health (SRHR) information and services in Uganda. In addition, this study found

a critical gap in female youths' sexual and reproductive health (SRHR) information and services in different areas, such as Bulamagi Sub-County, Iganga District, Kawempe Division, and Kampala. Female youths mainly gather that information from their mothers and might not have access to SRHR products like sanitary pads. Most of the female youths' pregnancies were the result of defilement, rape, coercion, or transactional sex since girls do not have access to reliable and sufficient SRHR information and services in those areas (Kakuru et al., 2024). They suggested female youth-friendly, rights-based SRHR services and comprehensive SRHR education (Kakuru et al., 2024). Therefore, it is crucial to explore factors that prevent female youths from accessing reproductive health information. In addition, we need to utilize new tools and technology, such as the Internet and social media, that could help female youths access reproductive health information in those regions.

In the realm of reproductive health, some countries might not have access to reproductive health information and services. As Griffin (2006) stated: "sexual and reproductive health (SRH) and access to services are heavily influenced, often negatively, by socio-cultural and political factors in the local and international context" (Griffin, 2006, p. 2). In this sense, I argue that some factors, such as family, society (Pillai & Gupta, 2011) culture, ethnicity, religion, geopolitical conditions (Alomair et al., 2020; Kyilleh et al., 2018), and national and international policies affect female youths' reproductive health. For example, a recent systematic review conducted in sub-Saharan Africa states that, while the WHO has published a global standard to improve reproductive health services for youths, they may not receive sufficient reproductive health information and adequate services due to cultural, governmental, and financial policies (Ninsiima et al., 2021).

In addition, certain powerful countries, such as the United States of America (USA) and the United Kingdom (UK), have a significant impact on the Global South, particularly regarding policies related to family planning and abortion in the Global South (Griffin, 2006).

For example, the Sustainable Development Goals aimed to continue reducing the Maternal Mortality Rate (MMR), with a global average target of < 70 per 100,000 live births by 2030. In this context, the U.S. Agency for International Development (USAID) provided family planning services worldwide and funded almost \$600 million for contraceptive services in poor countries, particularly in Africa. However, USAID fired many employees recently, and several people in poor countries were affected since they do not have access to reproductive health services and alternative treatments. If this suspension remains, millions of women and girls will face unwanted pregnancies and maternal death (Sasser, 2024).

Female youths in poor countries need to have access to reproductive health information and services that are accessible, acceptable, equitable, appropriate, effective, and gender-equitable (El Fakahany & Ibrahim, 2024). The inadequate access to these services highlights the need for new and alternative ways for female youths to access reproductive health information and services in the Global South. In this digital world, people can utilize the Internet to improve access to reproductive health information and services, as it serves as a platform for networking, communication, and information gathering (Baldock, 2016). Female youth have utilized digital technology to gather reproductive health information within the last decade in remote areas and urban resource-constrained settings (Goh et al., 2022). However, I have explored some controversies surrounding the role of the Internet and social media in providing reproductive health information to female youths in some countries of the Middle East. For example, some countries in the Middle East suffer from governmental and political issues, Eurocentric policies, and war (De Carvalho et al., 2021; Kolaee & Mirgaloyebayat, 2023). Therefore, people might not have access to high-speed internet because those governments overcontrol the Internet (Sinpeng, 2019). To investigate the exact effect of the Internet on female youths' reproductive health information, I focused on a group of countries in the Middle East that share some common characteristics, political issues, and

geopolitical situations, among others. Therefore, my research question was “What is the role of the Internet in providing reproductive health information to female youths in the Middle East?”. The objectives were as follows:

- 1) To explore the effects of the Internet and social media on female youths' reproductive health information in the Middle East.
- 2) To find internet-related barriers to female youths' access to reproductive health information.
- 3) To identify factors that can help female youths improve their access to reproductive health information using the Internet.

Theoretical Framework

To achieve my objectives, I utilized the “Cyberfeminism” framework in my research. Cyberfeminism emerged as a means of female emancipation, enabling women to access their rights and information in the changing and digital world (Mohanty & Samantaray, 2017). Sadie Plant, the director of the Cybernetic Culture Research Unit at the University of Warwick in the United Kingdom, proposed the concept of Cyberfeminism in 1994. The movement of Cyberfeminism emerged after the third wave of feminism, theorizing and integrating the Internet, cyberspace, and social media in feminism (Consalvo, 2012). Subsequently, scholars used the term Cyberfeminism in *A Cyberfeminist Manifesto for the 21st Century* in 1991 (Couey, 2003; Paasonen, 2005).

Cyberfeminism is a combination of technology and feminism. It focuses on the dissemination of the content of feminism and its ideology, sharing information, providing technology, and supporting a marginalized group of women. In this sense, women can utilize the Internet to make content by themselves, raise views, participate, discuss, and obtain information (Rai, 2017). Donna Haraway, a professor in the History of Consciousness

program at the University of California at Santa Cruz, argued that women need to be familiar with technology and engage with the “informatics of domination” (Consalvo, 2012, para. 3).

According to Mohanty and Samantaray (2017), women need information to utilize opportunities and careers, meet their health needs and sexual rights, and prevent violence and injustice. However, gender discrimination might prevent them from accessing that information completely. They stated that the masculinization of the computer culture would be the reason that women might have less access to technology, the Internet, and information. In addition, men are involved in the design and production of technology and information, spending more time online and practicing computer and Internet skills (Mohanty & Samantaray, 2017). Therefore, Haraway agreed that women should be savvy, literate, and informed. The empowerment of women and gender equity are the main principles of Cyberfeminism (Consalvo, 2012; Multani, 2023).

Cyberfeminism arose as a response to the lack of sufficient participation of women in activities related to technology and the Internet (Milford, 2015). Nowadays, due to the influence of Cyberfeminism, women communicate with others using technology. Cyberfeminism helps the liberation of women. By promoting digital inclusion and challenging patriarchal norms, cyberfeminism contributes to women’s liberation and freedom from subordination (Lasari & Dewi, 2023).

Women and girls face challenges, limitations, and constraints. Both cyberfeminism and non-cyberfeminism theoretical perspectives aim to address them. Cyberfeminism focuses on the use of virtual technology to reduce potential constraints upon women and girls, leading to their liberation and girls’ agency. The goal of Cyberfeminism is to increase gender equality and prevent patriarchal patterns in societies using technology and the Internet (Milford, 2015; Multani, 2023).

Like feminism, Cyberfeminism critiques social norms and constructs. It tries to address these challenges and solve injustice and oppression against women. Cyberfeminism is making and doing feminism online (Mustafa, 2024). Females can utilize blogging, tweeting, using hashtags, and distributing feminist texts to resist hegemonic and anti-feminist discourses. Mustafa (2024) considers these activities as the three main functions of the cyberfeminism movement, including mobilization, education, and documentation.

In this sense, Molina (2021), for example, stated that:

“We recognize our role as feminists and Internet rights advocates in securing a safe, healthy, and informative Internet for children and young people. This includes promoting digital and social safety practices. At the same time, we acknowledge children’s rights to healthy development, which includes access to positive information about sexuality at critical times in their development. We believe in including the voices and experiences of young people in the decisions made about harmful content.” (Molina, 2021, para. 21).

Therefore, the Internet and Cyberfeminism have a tremendous effect on children and young females. Using this lens, I could explore the effects of the Internet and social media on female youths' reproductive health information in the Middle East.

Motivations for this Research

Positionality

I am a 35-year-old Persian woman who was born in Iran. My father passed away when I was seven years old. My mother, who was a midwife, nurtured me and my two sisters. I decided to study midwifery to continue my mother's occupation. In addition, I aimed to help women in terms of mother and child care, reproductive health, and gynecology. My goal is to help girls and women during my lifespan.

I am an independent, able-bodied, neurotypical, cisgender, heterosexual, divorced woman and survivor of marital abuse. I have previously worked as a researcher in the field of

reproductive health. As part of my job, I wrote and developed project proposals, performed research, gathered and analyzed data, and prepared manuscripts for publication in research journals as well as textbooks. Furthermore, I presented results at conferences and attended workshops and symposiums. Finally, I decided to study Child, Youth, and Family Care (CYFC) to enhance my knowledge related to female youths and make fundamental changes in the reproductive health status of Iranian female youths.

I traveled to Canada to study CYFC at UVIC and had the opportunity to meet and communicate with scholars, experienced lecturers, and instructors. Moreover, I have privileged access to the latest technology and high-speed Internet in Canada.

Iranians face challenges due to a lack of high-speed Internet. Although the Internet and social media serve as effective tools to improve the dissemination of reproductive health information worldwide, Iranian female youth cannot easily access that information through the Internet and social media (Bakhtiari et al., 2023). With the advantages of high-speed Internet and educational facilities in Canada, I am dedicated to contributing meaningfully to research on reproductive health, a responsibility I embrace as a Persian woman.

Ontology, Epistemology, and Axiology

In the realm of ontology, I should say that my personal life and experiences connect to my research, knowledge, and practice. Health care literature shows a surge in research using realist methodology proposed by Roy Bhaskar (Williams et al., 2016). Therefore, my research is grounded in a critical realist ontology, recognizing the complex interplay between social, cultural, and economic factors influencing female youths' reproductive health in the Middle East (Kouam Arthur William, 2024; Williams et al., 2016). According to Williams (2016), I have to focus on real problems and acknowledge the complexity of the world as a healthcare professional. Hence, I acknowledge the inherent power dynamics and inequalities that shape the experiences of female youths in this region. I believe improving female youths'

reproductive health information in the Middle East enables them to advocate for their reproductive health rights and voice their needs. This perspective allows me to examine how the Internet can be both an empowering tool and a reflection of existing social structures.

My epistemology is rooted in a constructive approach. This approach is a valuable tool that enables me to explore truths about the interactions using the Internet and social media in the Middle East, considering diverse and changing realities of various social and cultural settings. In addition, it could address interaction problems that female youths face on social media platforms while searching for reproductive health information (Schwandt, 1994). This research emphasizes the importance of understanding the subjective experiences and perspectives of female youths in the Middle East. Using a systematic review study, I could understand the role of the Internet and social media in providing reproductive health information to female youths in the Middle East.

Axiologically, I am a Persian woman who aims to help female youths in the Middle East to be empowered, utilizing social justice and human rights. They need accurate and comprehensive reproductive health information. I value their empowerment since it helps them access that information. Using education and transformative knowledge, they could be empowered. I am committed to studying and researching female youths' reproductive health in my country and the Middle East to improve female youths' reproductive health information. I need to prioritize the voices and experiences of female youths in marginalized and remote areas and facilitate their access to reproductive health information in those areas with compassion, respect, and a commitment to transformative change. I will contribute to an inclusive and equitable understanding of their reproductive health needs in the Middle East.

Thesis Organization

This thesis is structured as follows: Chapter One introduces the research topic, motivation, and context, highlighting the reproductive health information gap in the Middle

East and the potential role of the Internet in providing that information. Chapter Two presents a literature review synthesizing existing research and identifying knowledge gaps. In Chapter Three, I present the research methodology detailing the systematic review approach guided by PRISMA and “Reflexive Thematic Analysis”. The subsequent chapters present the research findings, followed by a discussion that addresses my research question, limitations, and strengths of the research.

Chapter Two- Literature Review

The Effects of the Internet on Female Youths' Reproductive Health

Female youth access information, including reproductive health information, using the Internet, around the world. They are increasingly turning to digital technology to find that information because of cultural, religious, and political sensitivities in the Middle East. This literature review explores the effect of the Internet and social media on female youths' reproductive health information in the Middle East, while examining some factors, such as cultural, educational, and religious. In addition, it presents some facilitators, such as digital literacy, trusted sources, and education, that help female youth access reproductive health information in the Middle East. Finally, it discusses gaps in the literature and shows how existing research does not fully answer my research questions.

People use the Internet and social media for several purposes, including chatting, building virtual friendships, playing games, and seeking information for academic and health purposes (Al-Shdayfat et al., 2019). Female youths use the Internet for communication (personal, professional, and networking) and information gathering. Moreover, they obtain information on female youths' rights, health, and religion via the Internet (Choudhury, 2009). Choudhury (2009) states, "I would like to be optimistic here and believe that the Internet has the potential to show them ways to be empowered" (p. 362). However, I need to focus on the countries in the Middle East, considering the objectives of this study. Al-Shdayfat et al. (2019) conducted a community-based qualitative study in Jordan to explore Jordanian female youths' perspectives on using the Internet and social media to find reproductive health information. They concluded that female youths often access the Internet and social media to find reproductive health information in that region. However, the information on the Internet and social media might not be accurate (Vizheh et al., 2024).

Vizheh et al. (2024) note that while the Internet and social media in Iran may contain inaccurate reproductive health information, they play a crucial role in filling the knowledge gap due to female youths' limited access to reproductive health information. Because of the conservative context of Iran, the silence in reproductive and sexual health education, and some taboos related to sexual health, female youths have insufficient access to reproductive and sexual health information. The Internet and social media can be useful tools for improving female youths' reproductive health information, although they may disseminate misleading information (Vizheh et al., 2024).

In Iran, female youths often rely on the Internet and social media for reproductive and sexual health information due to the lack of official education on these topics, despite potential inaccuracies (Rakhshae et al., 2020). According to Rakhshae et al., female youths' ability to search online and explore reproductive and sexual health information facilitates their access to that information. Therefore, female youths need to find valid, trustworthy, and credible reproductive and sexual health information. Rakhshae et al. (2020) state:

“Women did not trust some of the information that was received from the Internet, pornographic movies, experiences of acquaintances, and inexpert individuals; they mostly trusted information received from physicians, midwives, and books. They also considered the information received from scientific and specialized websites as valid” (p.7).

The more women are familiar with the Internet and social media, the more they are empowered and obtain accurate reproductive health information (Meherali et al., 2021).

Although the Internet and social media are useful tools for accessing reproductive and sexual health information in Iran, the preferences of men and women are different (Rahimi-Naghani et al., 2016). By way of illustration, while men prefer to obtain information about puberty and sexuality using the Internet, women prefer to receive puberty, reproductive system, and sexual information from teachers, doctors and specialists, and their mothers

(Rahimi-Naghani et al., 2016). This study emphasizes the importance of female youths' digital literacy.

According to Gilster's definition, digital literacy is "the ability to understand and use information in multiple formats from a wide variety of sources when it is presented via computers" and, particularly, through the medium of the Internet (Pangrazio et al., 2020). Digital literacy could enhance female youths' reproductive health information. Meherali et al. (2021) examined the impact of digital literacy on female youths' reproductive health information in low- and middle-income countries. They employed 35 eligible studies and concluded that the Internet, websites, social media, mobile applications and games, mobile phones, and reproductive health education using the Internet have positive effects on female youths' reproductive health information in those countries. Therefore, digital literacy plays a key role in female youths' reproductive health information.

While digital literacy and access to the Internet might help female youth find reproductive health information, it could also hurt them. In this context, Karabulutlu and Aydın (2024) conducted a cross-sectional study on 200 pregnant female youths in Turkey to find the effect of the Internet on pregnant female youths. They found that while pregnant women access pregnancy-related information on the Internet, too much information had a significant negative effect on their fear of childbirth (Karabulutlu & Aydın, 2024). By contrast, another study revealed that Turkish pregnant female youths receive pregnancy-related information from the Internet, and it decreases most pregnant female youths' fear of childbirth (Serçekuş et al., 2021).

Another recent study conducted in Iran has indicated no consensus on the effect of the Internet on the fear of childbirth. Mousavi et al. (2022) conducted a randomized controlled trial on pregnant female youths in Iran. They delivered reproductive health information via the social media platform 'Telegram' and in-person sessions for three pregnant groups. This

study showed non-significant differences between the three groups in terms of pregnancy experience and fear of childbirth (Mousavi et al., 2022). Unlike Mousavi et al. (2022), Javanmardi et al. (2018) concluded that the Internet reduces anxiety and increases confidence in pregnant female youths. They conducted a systematic review of 16 related publications worldwide and found the positive effect of the Internet on female youths (Javanmardi et al., 2018). How is it possible that female youths in the Middle East have struggled to use the Internet or find accurate reproductive health information? My first research question will fill this gap by focusing exclusively on the effect of the Internet on female youths' reproductive health information in the Middle East. In the next part, I review barriers and factors that prevent female youths from accessing that information.

Barriers

Young people face barriers accessing sexual and reproductive health information, including health provider bias and fear of stigma, refusal, and embarrassment in seeking information and services in the world, either in the Global North or Global South (L'Engle et al., 2016). However, these barriers may be slightly different in the Global South. For example, Fatemi et al. (2023) state that some barriers, such as a conservative approach in the educational system, public media, or families, prevent female youths from accessing reproductive and sexual health information in Iran. This contextual difference mentions that we need a culturally sensitive approach to help female youth access reproductive health information in the Global South.

Because of the mentioned barriers, female youth utilize the Internet and social media to access sexual and reproductive health information worldwide. L'Engle et al. (2016) conducted a systematic review of 35 eligible publications worldwide. They state that 15- to 24-year-olds are more likely than older age groups to use the Internet and mobile applications to access reproductive health and sexual health information, as they have technology and

knowledge. They use the Internet and mobile applications to find accurate, timely, and engaging sexual and reproductive health information since they are inexpensive, portable, and accessible (L'Engle et al., 2016). However, in some regions of the Middle East, female youths do not have easy access to the Internet and mobile applications.

Farahani et al. (2020) announced that easy access to sexual and reproductive health information might not be accepted in some regions of the Middle East. They conducted a conceptual review of 43 eligible publications from 2001 to 2019 and state that easy access to reproductive health and sexual information might motivate youths to get involved in premarital sex in some regions in which premarital sex is not accepted by society and its culture, such as Iran (Farahani, 2020). Conversely, L'Engle et al. (2016) consider the Internet and mobile applications as an opportunity that increased sexual health knowledge and awareness, lowered rates of unprotected sex and higher rates of condom use, and greater sexually transmitted infection (STI) testing. Similarly, a recent study conducted in Malaysia, where the formal religion is Islam, revealed that the Internet is a useful tool for accessing reproductive health information (Qi & Omar, 2020). Qi et al. (2020) explored different sources of reproductive health information among undergraduate students in Malaysia. They used interviews and thematic analysis to compare different sources of that information and students' preferences. According to the results of this study, the Internet was the most desired and frequently used source for providing reproductive health information to students. They state that the Internet is becoming a common way of accessing reproductive health information among students. Therefore, I have to look for factors that prevent female youths from accessing reproductive health information using the Internet.

In this context, Puspita et al. (2021) conducted a descriptive-analytic cohort study aiming to examine the relationship between the Internet and female youths' reproductive health knowledge in Yogyakarta. They recruited 124 male and female students. While they

could not find any relationship between Internet usage and participants' reproductive health knowledge, they mentioned that different factors affect female youths' reproductive health information, including education, mass media, social culture, economy, environment, experience, and age. Hence, these factors could be potential barriers that prevent female youth from accessing reproductive health information (Puspita et al., 2021). However, Yogyakarta is not located in the Middle East region, and the participants of this study were both male and female. To my knowledge, the specific barriers that prevent female youth from accessing sexual and reproductive health information using the Internet in the Middle East have not been explored. This leads to my second research question, which is defined in the issues, challenges, and gaps part.

While certain barriers prevent female youths from accessing reproductive health information, other factors can facilitate and improve their access to that information. For example, Al-Shdayfat et al. (2019) state that female youths can find sexual and health information using the Internet and social media quickly and easily. However, unmonitored Internet access might harm them due to exposure to unreliable and incorrect information. Therefore, a culturally sensitive website could help them access accurate and reliable sexual and reproductive health information (Al-Shdayfat et al., 2019).

In this context, Karamouzian et al. (2017) conducted a cross-sectional study on 742 male and female university students to examine the awareness of and knowledge about STI. They found that the Internet was the main source of youths' sexual health information, and the accessibility and visibility of credible Internet sites were warranted (Karamouzian et al., 2017). The Internet should be available to them everywhere. Similarly, another study considers widespread Internet use a facilitator that helps female youth access reproductive health information in Qatar (Al-Dahshan et al., 2021).

Focusing on resources extracted from the Middle East literature review, education (Ahmadian et al., 2020; Al-Dahshan et al., 2021, 2023; Alomair et al., 2020; Karabulutlu & Aydın, 2024; Nabovati et al., 2023; Sabetghadam et al., 2022), high digital literacy (Al-Dahshan et al., 2021; Alomair et al., 2020; Nabovati et al., 2023) and female youths' empowerment (Al-Dahshan et al., 2021), are some factors that help female youths access sexual and reproductive health using the Internet and social media. However, no systematic literature review has examined them. While Bam and Girase (2015) conducted a systematic review in selected Asian countries to explore the role of information and communication technology in female youths' reproductive health information, it was not related to the Middle East countries. They concluded that information and communication technology can improve reproductive and sexual health in selected countries, including Afghanistan, India, Nepal, and Sri Lanka (Bam & Girase, 2015). Although this study confirms the positive role of the Internet on reproductive health information, it assessed female youths' reproductive health information in four selected countries in Asia. No systematic review has focused on the role of the Internet in providing reproductive health information to female youths in the Middle East.

Defining Issues, Challenges, and Gaps

There is contradictory evidence regarding the usefulness of the Internet in female youths' access to and use of reproductive health information in the Middle East. While some scholars (Al-Shdayfat et al., 2019; Rahimi-Naghani et al., 2016; Rakhshaei et al., 2020; Vizheh et al., 2024) believe that the Internet and social media are valuable platforms to improve female youths' reproductive health information in the Middle East, others (Farahani, 2020; Fatemi et al., 2023; Puspita et al., 2021) disapprove of this claim. Moreover, the findings are inconsistent. This gap underscores the need to examine whether the Internet and social media positively affect female youths' reproductive health information in the Middle

East. Hence, this gap leads to the first question: What are the effects of the Internet and social media on female youths' reproductive health information in the Middle East?

In addition, I need to explore factors that prevent female youths from accessing reproductive health information in the Middle East. While some global research, such as L'Engle et al. (2016), highlights preventive factors, such as stigma and provider bias, Fatemi et al. (2023) and Farahani et al. (2020) emphasize sociocultural factors in the Middle East. Moreover, while the Internet and social media are youth-friendly and accessible tools to find reproductive health information, they are limited and restricted in the Middle East due to some preventive factors. Considering that some Muslim countries, such as Malaysia and Indonesia, offer valuable insight about barriers that prevent people from accessing reproductive health information using the Internet, which could be addressed, they are not transferable to my research due to sociopolitical and geographical differences. This highlights a specific gap in the literature review, and my research assesses complex, region-specific barriers faced by female youth in the Middle East. My second question that will fill this gap would be: What are the Internet-related barriers to female youths' access to reproductive health information? Additionally, I need to find some factors that help female youth access reproductive health information in the Middle East using the Internet and social media, as my third research objective. To my knowledge, no systematic review has analyzed studies that have examined female youths' access to reproductive health information using the Internet and social media in the Middle East. Therefore, conducting a systematic review is crucial to identify concepts, trends, and questions that are repeated, altered, and changed in the literature.

Chapter Three- Methodology

This thesis aimed to understand the role of the Internet in providing reproductive health information to female youths in the Middle East. The main research question was “What is the role of the Internet in providing reproductive health information to female youths in the Middle East?”. In this research, I have used the Cyberfeminism framework. In this chapter, I will expand on the steps of systematic reviews and ethical considerations.

Designing a systematic review instrument, as stated in the PRISMA 2020, comprises a formal, prespecified protocol with explicit, transparent criteria for the inclusion and exclusion of literature, thereby ensuring the completeness of coverage of the available evidence and providing a more objective, replicable, and comprehensive knowledge synthesis (Page et al., 2021). This study, therefore, draws upon the PRISMA lens to synthesize the study data.

Designing a systematic review involves several sequential key steps (Akobeng, 2005). In congruence with the above, Templier and Pare (2015) argued that a systematic literature review instrument followed six steps, including “1) formulating the research question(s), 2) searching the literature, 3) screening for potentially eligible studies, 4) assessing the quality of studies, 5) extracting the data, and 6) analyzing the data” (Kakuru et al., 2023, p. 8).

Guiding Questions

The question guiding this study is: What is known about the role of the Internet in providing reproductive health information to female youth in the Middle East? Drawing insights from the question-framer format, as in a systematic review, the PICO acronym (Population, Intervention, Comparator, and Outcome) (Amir-Behghadami & Janati, 2020), the “Population” of this study is female youths. There is no “Intervention” or “Comparator” in this study, and the “Outcome” here seeks to find the role of the Internet in providing reproductive health information to enhance female youths’ reproductive health information in the Middle East.

Searching the Literature

A thorough literature search is essential to identify all articles related to the research question and to ensure that no relevant article is left out. I have input these search protocols via the Uvic database (MEDLINE, EBSCO Academic Search Complete, and PubMed) (*MH & quot; Internet+";) OR (MH & quot; Sexual Health & quot;;) OR (MH & quot; Social Media";) OR (MH"; Reproductive Health";) OR (MH & quot; Reproductive Health Services+";) OR (MH"; Socioeconomic Disparities in Health";). Then I narrowed it down to the Middle East. Finally, I put my search results in the Covidence platform.*

Covidence is a platform for managing the titles and abstracts of publications and reviewing their full texts in systematic reviews. It is a free-of-charge online tool that is owned by Veritas Health Innovation in Victoria, Australia. Its functions include programming reviewers, importing publications, reference management, removing duplicate publications, making a template for reviewing, recording reviewers' decisions, resolving their conflicts, and exporting data based on reviewers' decisions (Macdonald et al., 2016).

Screening Eligible Studies

Reviewing similar literature, I have developed some inclusion and exclusion criteria for my systematic review. Inclusion criteria were as follows: scholarly studies of the countries of the Middle East, including Iran, Saudi Arabia, Iraq, Syria, Israel, Turkey, Jordan, United Arab Emirates, Kuwait, Yemen Arab Republic, Lebanon, Bahrain, Oman, Qatar, Algeria, Morocco, Egypt, and Tunisia (Kurtzig et al., 1987). Other criteria were publications released between 2005-2024, all resources, including unpublished and published theses, dissertations, reports, books, chapter books, peer-reviewed qualitative or quantitative manuscripts, written in English, and studies that focused on female youths from 14 to 24 years old. Since we had some studies that included 14-year-old participants according to other definitions of female youths, we

considered this age range to avoid missing valuable related publications. I made a template on the Covidence website based on the mentioned inclusion criteria and included relevant publications. I excluded studies that have focused on men's reproductive health information and non-English publications.

Assessing the Quality of Studies

The “Trustworthiness or truth value of qualitative research and transparency of the conduct of the study is crucial to the usefulness and integrity of the findings.” (Connelly, 2016, p. 435). Therefore, I considered the trustworthiness of the study, which means that I ensured the confidence of the data, interpreted them correctly, and used an appropriate method (Connelly, 2016). Hence, I assessed the quality of the studies.

I used the JBI Critical Appraisal Checklist for Qualitative Research to assess the quality of studies (Lockwood et al., 2015). This checklist explores the consistency between the different parts of each study. For example, it shows the congruity between the research questions, methodology, ethics, method, and results of a study. Two appraisers, including Dr Doris Kakuru and I, assessed each study using the checklist. The checklist contains ten questions with Yes, No, and Unclear (Y/N) answers. The questions are as follows (Lockwood et al., 2015):

1. Is there congruity between the stated philosophical perspective and the research methodology?
2. Is there congruity between the research methodology and the research question or objectives?
3. Is there congruity between the research methodology and the methods used to collect data?
4. Is there congruity between the research methodology and the representation and analysis of data?
5. Is there congruity between the research methodology and the interpretation of results?

6. Is there a statement locating the researcher culturally or theoretically?
7. Is the influence of the researcher on the research, and vice versa, addressed?
8. Are participants and their voices adequately represented?
9. Is the research ethical according to current criteria, or, for recent studies, and is there evidence of ethical approval by an appropriate body?
10. Do the conclusions drawn in the research report flow from the analysis or interpretation of the data?

Accordingly, appraisers included or excluded studies from this systematic literature review. I have attached the checklist and related information to interpret the checklist and questions as Appendix 1.

Data Extraction

In this stage, I employed eligible studies for data extraction. I classified data based on the following categories: “Author(s), study aim(s), location of the research, study design and methods, sample size, participant characteristics (e.g., age, gender, and the country of origin), and participants’ socio-demographic information (e.g., education level) (Kakuru et al., 2023, p. 12). In addition, I explored the positive or negative effects of the Internet and social media on female youths’ reproductive health information. Moreover, I identified the factors that facilitate access to reproductive health information and the factors that prevent female youths from accessing reproductive health information. Two reviewers, including Dr Doris Kakuru and I, reviewed the titles and abstracts of the studies and extracted the data from full-text publications on the Covidence platform. In the results part, I will present the PRISMA Figure of my research.

Analyzing the Data

Systematic review studies employ Thematic analysis (TA) to analyze the data. TA emerged to describe phenomena in qualitative studies using careful reading and re-reading of

the data (Fereday & Muir-Cochrane, 2006). Scholars use TA to identify, analyze, and interpret patterns of meaning, known as themes (Braun & Clarke, 2006a).

Researchers find codes that are the smallest units to explore themes and capture relevant features (Braun & Clarke, 2006a). They recognized important moments and encoded them using TA. A code that captures the qualitative richness of the phenomenon is considered good (Fereday & Muir-Cochrane, 2006).

Codes build themes that have the main concepts and the core idea of data, and present a framework to organize and report observations and results (Braun & Clarke, 2006a). Boyatzis (1998) defined a theme as “a pattern in the information that at minimum describes and organizes the possible observations and at maximum interprets aspects of the phenomenon” (p. 161) (as Fereday & Muir-Cochrane, 2006, cited in their study).

There are two types of TA, inductive (data-driven) and deductive (theory-driven) analyses. Inductive analysis uses data to produce new codes, regardless of previous codes and themes. Conversely, deductive analysis utilizes the researcher’s theoretical or analytic interest to explore codes (Braun & Clarke, 2006b).

Braun and Clarke (2006) state that the TA framework has some stages as follows: “familiarizing yourself with your data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, producing the report” (p. 87). Table 1 describes these stages.

Table 1

Phases of Thematic Analysis (Braun & Clarke, 2006b, p. 87)

Phase	Description of the process
1-Familiarizing yourself with your data:	Transcribing data (if necessary), reading and re-reading the data, and noting down initial ideas.
2. Generating initial codes:	Coding interesting features of the data systematically across the entire data set, collating data relevant to each code.
3. Searching for themes:	Collating codes into potential themes, gathering all data relevant to each potential theme.

4. Reviewing themes:	Checking if the themes work about the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic ‘map’ of the analysis.
5. Defining and naming themes:	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
6. Producing the report:	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis

For many years, scholars have used TA in their qualitative research. However, Clarke and Braun (2019) proposed another approach called “Reflexive TA” in qualitative research. They state that TA is not useful if it is used mechanically without thoughtful reflection or theoretical depth. As they state: “Many of the (problematic) uses and interpretations of ‘our’ approach to TA seem to be unknowing, unreflexive and indicative of some degree of conceptual confusion” (Braun & Clarke, 2019, p. 2). Therefore, Clarke and Braun (2019) suggested the Reflexive TA, which could be implemented in a wide variety of contexts and countries. I utilize this approach in my research in the Middle East.

I am a young researcher who was born and raised in the Middle East. According to Clarke and Braun (2019), I need to be thoughtful and use an intentional process in my research with a deep consideration of philosophical and methodological choices. “Assumptions and positionings are always part of qualitative research. Reflexive practice is vital for understanding and unpacking these. It is good practice to reflect on and identify what you’re assuming, and interrogate whether those assumptions hold for any particular project.” (Braun & Clarke, 2019, p. 8). Hence, I should be creative, reflexive, and subjective, utilizing Reflexive TA, rather than just following step-by-step procedures (Braun & Clarke, 2019).

Therefore, I reflected on data collection questions and summarized domains to construct new themes. My themes would be related to a shared topic, and not shared meaning. I generated themes that might not be pre-existing in the data (Braun & Clarke, 2019).

Ethical Considerations

This study follows the ethical considerations of Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (Canada, 2018). As stated in Chapter 2, Section B of TCPS2, the Research Ethics Board (REB) must carefully assess previous relevant literature systematically reviewed and summarized by researchers to ensure that the foreseeable risk is justified by the potential benefits to be gained and appropriately minimized (Canada, 2018). In addition, Boilevin et al. (2019) proposed four ethical expectations for text-based researchers. Following such a paradigm, researchers' social locations or positionality, motivation for research, as well as experiences, should be clearly stated to minimize biases in data extraction and knowledge synthesis (Boilevin et al., 2019).

A systematic review has six ethical considerations, including "1) identifying an appropriate epistemological orientation, 2) identifying an appropriate purpose, 3) searching for relevant literature, 4) evaluating, interpreting, and distilling evidence from selected reports, 5) constructing connected understandings, and 6) communicating with an audience." (Suri, 2019, p. 42). Therefore, we employed this ethical lens in our study and utilized appropriate tools, such as the JBI Critical Appraisal Checklist for Qualitative Research (Lockwood et al., 2015) to check the credibility, dependability, confirmability, and transferability of studies (Connelly, 2016).

In conclusion, this study sought to systematically review relevant literature in line with the factors that prevent female youths in the Middle East from accessing reproductive health care services and information using the Internet. The study followed all the ethical requirements to create knowledge using search strings as question framers, PICO format, and protocols as outlined in the PRISMA for doing systematic reviews.

Chapter 4- Findings and Analysis

The question guiding this research was “What is the role of the Internet in providing reproductive health information to female youths in the Middle East?”. This chapter presents my findings using the PRISMA systematic review protocol. I have organized my conclusions based on the following questions: How does the Internet affect female youths’ access to reproductive health information in the Middle East? What are the Internet-related barriers to female youths’ access to reproductive health information? How can female youths’ access to reproductive health information be improved? Under each of these questions, I have organized my findings into themes that emerged through the analysis.

Figure 1 shows the pathway of my systematic review in the Covidence platform. After searching the databases, we imported 269 publications. Then, the Covidence removed 133 duplicate publications. Two reviewers screened a total of 136 publications and excluded 69 publications using the inclusion and exclusion criteria. After the full-text screening, 40 publications were excluded for the following reasons: Non-English publication, wrong population, not related to the study objectives, and insufficient information about the age of participants. Finally, 27 publications were selected for review.

Eligible studies were conducted in Jordan, Qatar, Iran, Saudi Arabia, Morocco, Turkey, and the United Arab Emirates from 2008 to 2024. Table 2 presents the studies and related information. All studies focus on female youths. However, two of them analyzed websites and digital health initiatives, and we kept them to utilize their valuable information regarding the research questions. I extracted information related to the Internet and social media, as well as their effectiveness on female youths’ reproductive health information, outcomes, facilitators, and barriers, to answer our research questions and introduce some themes. In addition, I utilized the data from those studies to identify new themes. In the next section, I will present them.

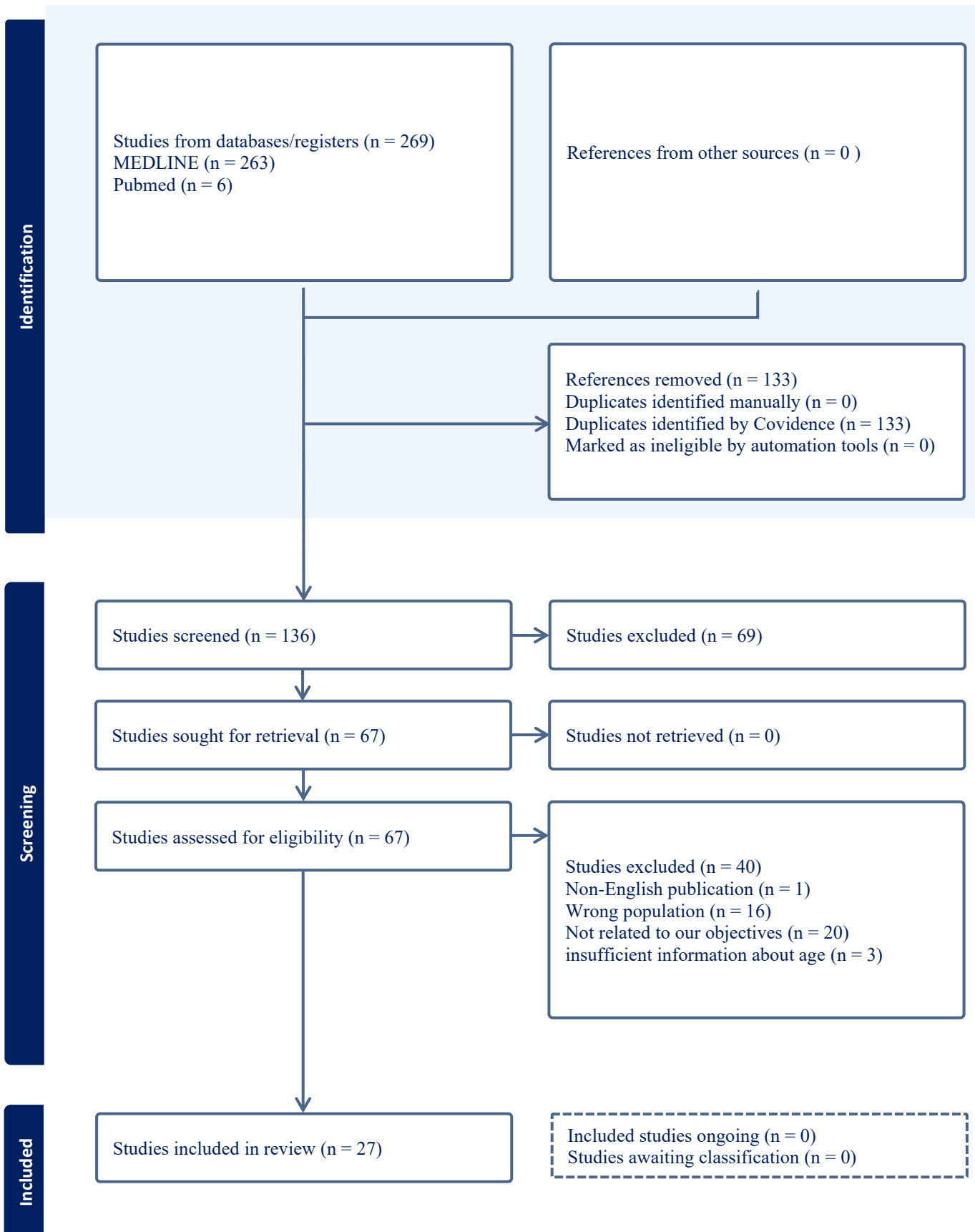
Figure 1*PRISMA figure for the study*

Table 2*Included studies*

Title	The country	Study design	Authors
Adolescents Perspectives Towards Using Social Networking and Internet to Gain Information about Reproductive and Sexual Health in Jordan: A Qualitative-Community Based Study	Jordan	Qualitative research	(Al-Dahshan et al., 2021)
Utilization of the Internet for physical activity and diet information and its influence on pregnant women's lifestyle habits in Qatar.	Qatar	Cross-sectional study	(Al-Dahshan et al., 2023)
Sexual health literacy level and its related factors among married medical sciences college students in an Iranian setting: a web-based cross-sectional study.	Iran	Cross-sectional study	(Nematzadeh et al., 2024)
Sexual and reproductive health knowledge, perceptions and experiences of women in Saudi Arabia: a qualitative study.	Saudi Arabia	Qualitative research	(Alomair et al., 2021)
Perceptions and intervention preferences of Moroccan adolescents, parents, and teachers regarding risks and protective factors for risky sexual behaviors leading to sexually transmitted infections in adolescents: qualitative findings.	Morocco	Qualitative research	(El Kazdouh et al., 2019)
Pattern of Internet use for pregnancy-related information and its predictors among women visiting primary healthcare in Qatar: a cross-sectional study.	Qatar	Cross-sectional study	(Al-Dahshan et al., 2021)
Knowledge, attitudes, and practices related to the prevention of adverse pregnancy outcomes among samples of females in Al-Suwaira city, Wasit Governorate, Iraq.	Iraq	Cross-sectional study	(Dawood Salim et al., 2024)
Determination of risky sexual behaviors and associated factors of Turkish young women.	Turkey	Cross-sectional study	(Bilge et al., 2023)
Knowledge and misconceptions of Saudi women about sexually transmitted infections.	Saudi Arabia	Cross-sectional study (descriptive study)	(Balbeesi & Mohizea, 2017)
Knowledge and attitude of reproductive-aged women towards planned oocyte cryopreservation in the United Arab Emirates.	United Arab Emirates	Cross-sectional study	(Sayegh et al., 2023)

Evaluation of reproductive health and sexual behaviors of university students: case study from Istanbul.	Turkey	Case study (Descriptive)	(Rathfisch et al., 2012)
The Role of Social Media in Promoting Women's Health Education in Saudi Arabia.	Saudi Arabia	Qualitative	(Bahkali, Almainan Ahmad, et al., 2015))
Evaluation of education and counseling using social media tools after discharge in women who underwent episiotomy.	Turkey	Randomized controlled trial	(Öz & Güloğlu, 2023)
Comparing the effect of childbirth preparation courses delivered both in-person and via social media on pregnancy experience, fear of childbirth, birth preference and mode of birth in pregnant Iranian women: A quasi-experimental study.	Iran	Randomized controlled trial	(Mousavi et al., 2022)
Maternal Health Literacy, Health information-seeking Behavior and Pregnancy Outcomes Among Iranian Pregnant Women: A Cross-Sectional Study.	Iran	Cross-sectional study	(Sabetghadam et al., 2022)
Internet use by pregnant women seeking childbirth information.	Turkey	Cross-sectional study	(Serçekuş et al., 2021)
Use of the Internet by pregnant women to seek information about pregnancy and childbirth.	Iran	Cross-sectional study	(Ahmadian et al., 2020)
The relationship between Internet addiction and fear of childbirth in pregnant women.	Turkey	Cross-sectional study	(Karabulutlu & Aydın, 2024)
Sexual health knowledge and influencing factors among health science students at a state university in Turkey.	Turkey	Cross-sectional study	(Uğurlu & Karahan, 2021)
Sexual attitudes, behaviour changes and opinions of interns in Izmir, Turkey.	Turkey	Cross-sectional study	(Ozan et al., 2010)
Pregnant women's use and attitude toward Mobile phone features for self-management.	Iran	Cross-sectional study	(Nabovati et al., 2023)
Personal data governance and privacy in digital reproductive, maternal, newborn, and child health initiatives in Palestine and Jordan: a mapping exercise.	Jordan	Mapping exercise	(Nemer et al., 2023)
Perceptions Toward the Use of Digital Technology for Enhancing Family Planning Services: Focus Group Discussion With Beneficiaries and Key Informative Interview With Midwives.	Jordan	Qualitative research	(Yousef et al., 2021a)
Efficacy of mobile-based educational intervention using Instructional Systems Design in promoting preventive behaviors for sexually transmitted	Iran	Randomized controlled trial	(Juyani et al., 2024)

infections among Iranian women: a randomized controlled trial.			
Awareness of and Knowledge About STIs Among Nonmedical Students in Iran.	Iran	Cross-sectional study	(Karamouzian et al., 2017)
Accuracy and coverage of reproductive health information on the Internet accessed in English and Persian from Iran.	Iran	Other: Descriptive	(Rahnavardi et al., 2008)
A mobile-based educational intervention on STI-related preventive behavior among Iranian women.	Iran	Randomized controlled trial	(Kazemi et al., 2021)

Themes

The Effect of the Internet on Access to Reproductive Health

This theme includes two sub-themes, “reproductive health services” and “female youths’ reproductive health information”. I explained them in the following sections.

Reproductive Health Services

All 27 studies revealed that participants utilize the Internet to find reproductive health information or reproductive health services. In terms of reproductive health services, a recent study shows that pregnant female youths like to receive prenatal care services using the Internet and mobile applications in Iran. They use the Internet and mobile applications to book prenatal appointments and access the results of paramedical examinations, such as ultrasound examinations or laboratory test results (Nabovati et al., 2023). Similarly, Serçekuş et al. (2021) state that the Internet-based interventions could be a new prenatal care model in Turkey since pregnant female youths like to utilize the technology-based intervention during their prenatal period. However, the rate of Internet usage among pregnant female youths should be supervised by medical staff (Serçekuş et al., 2021). They are responsible for identifying the negative effects of the Internet on pregnant female youths, such as the fear of childbirth. In this sense, Karabulutlu and Aydın (2024) suggested that midwives and nurses should provide prenatal health services using the Internet and social media in Turkey, while

educating, following up pregnant female youths, and preventing any harm, such as Internet addiction and fear of childbirth (Karabulutlu & Aydın, 2024).

Since reproductive health services are challenging and create a responsibility for medical staff, we need more research and clinical trials to determine how effective and safe online services are. Mousavi et al. (2022) conducted a randomized controlled trial in Iran. They compared the effectiveness of in-person and online courses in childbirth preparation. They did not find any significant differences between the fear of childbearing in the two groups of pregnant female youths. Therefore, online prenatal care might be an option for pregnant female youths, particularly in remote or marginal areas in the Middle East. For example, digital health is becoming a part of reproductive health services in Jordan and Palestine. Their health system has utilized digital technology to provide productive, maternal, newborn, and child health (RMNCH). They use the Internet for booking appointments, consultations, and education (Nemer et al., 2023). Similarly, Al-Shdayfat et al. (2019) conducted a qualitative study in Jordan to assess the effect of digital health on enhancing family planning services. They interviewed 17 midwives and concluded that digital health is a feasible, cost-effective, well-accepted, and useful tool for improving family planning services.

Hence, the Internet and social media have a positive effect on female youths' reproductive health information in the Middle East and could be a useful tool for providing reproductive health services, provided that the healthcare system and medical staff of those countries manage that information and services.

Female Youths' Reproductive Health Information

To find the exact effect of the Internet and social media on female youths' reproductive health knowledge, I extracted the outcomes of some interventions, such as using the Internet and social media to improve that information. The positive effects of the Internet on female youths' reproductive health knowledge were as follows:

Pregnancy-related Information: The findings of the study show that female youths use the Internet and social media to extract pregnancy-related information in the Middle East. Al-Dahshan et al. (2021) conducted a cross-sectional study at the six antenatal clinics of Qatar, and recruited 385 pregnant female youth (18–25 years old: 18.5%) in a cross-sectional study. It showed that pregnant female youths utilized the Internet and social media to find information related to fetal development, management of health problems, personal care, preparation for delivery, infant care, infant feeding, and intimacy (Al-Dahshan et al., 2021). Similarly, Dawood Salim et al. (2024) conducted a cross-sectional study in Iraq. They assessed 118 pregnant female youths and revealed that participants utilized the Internet to learn more about pregnancy-related risk factors (Dawood Salim et al., 2024). In another qualitative study, Bahkali et al. (2015) examined 779 pregnant female youths aged 15-24 in Saudi Arabia. They found that female youth seek pregnancy information and breastfeeding help on the Internet. In addition, they use that for finding gynecology information, such as menstrual period irregularity, polycystic ovarian syndrome, sexual dysfunctions, drug interaction, vaginal discharge, gynecological cosmetic issues, and infertility (Salwa et al., 2015). Since infertility is one of the important problems that female youths face during their reproductive age, the Internet and social media could be a helpful resource for them to obtain that information. For example, Sayegh et al. (2023) examined 422 infertile participants in a cross-sectional study. They state that participants utilize the Internet and social media to find Information related to planned oocyte cryopreservation. These findings highlight the positive effect of the Internet and social media on female youths' related information in the Middle East (Sayegh et al., 2023).

Childbearing and delivery information: In addition to pregnancy-related information, female youth might seek information related to childbearing and the postpartum period. For example, Öz and Güloğlu (2023) conducted a randomized controlled trial in

Turkey. They recruited 60 pregnant female youths who had experienced normal vaginal delivery followed by episiotomy. They concluded that female youths who had online education and counselling using social media had experienced fewer side effects and pain after episiotomy compared with the control group (Öz & Güloğlu, 2023). Another study showed that female youths gather postpartum information using the Internet in Turkey. Serçekuş et al. (2021) studied 162 pregnant female youths in a cross-sectional study, including female youths. They state that the Internet is the main source of participants' childbearing information and decreases their fear of childbearing. Websites and blogs are the most popular online resources for them.

Sexual health information: Al-Shdayfat et al. (2019) carried out a qualitative community-based study in Jordan to find female youths' perspectives on using the Internet and social media to access sexual and reproductive health information. They assessed 48 participants, who were younger than 19 years old, and found that participants prefer to use the Internet and social media to obtain that information. Moreover, in a cross-sectional study, Ozan et al. (2010) examined 220 medical students in Turkey (the mean age was 19.6 (SD = 2.2) for first-year students and 24.6 (SD = 1.0) for interns). They found that while friends were the first source of sexual health information in the first year, the Internet became the main source of that information after six years (Ozan et al., 2010). Additionally, Uğurlu and Karahan (2021) assessed 738 students (aged 17-27 years) in a cross-sectional study in Turkey. They found that 72% of students use the Internet as a first choice to access sexual health information (Uğurlu & Karahan, 2021). Another descriptive study in Turkey that examined 647 university students, including 75% (N = 490) female students and 24.3% (N = 157) male students, confirmed that the Internet is the main source of sexuality information in 69% of youths (Rathfisch et al., 2012). Similarly, Bilge et al. (2023) studied 1430 female youths (aged 18-24 years) in a cross-sectional study in Turkey and found that 80% of them utilize the

Internet and media to access sexual information. However, they had risky behaviors if they lived far from their family (Bilge et al., 2023).

While the Internet has lots of positive effects, El Kazdough et al. (2019) stated that it might affect the sexual behavior of females. They conducted a qualitative study on groups of youths (28 boys and 28 girls, 14–16 years old), 5 groups of parents (21 males and 5 females), and 4 groups of teachers (13 males and 5 females), and had a focus group discussion based on the socio-ecological model in Morocco. They state that some factors, such as risky sexual practices, STI, schools, culture, the Internet, and social media, might affect youths' risky sexual behaviors. There was a perception among participants that the Internet and other media could increase youths' sexually risky behaviors. Most of the participants in the three groups agreed that the Internet and social media hurt youths' sexual behaviour. They claim that the Internet makes it easier for teenagers to engage in risky sexual behavior since it presents characters with multiple emotional and sexual relationships, shows pornographic content, and facilitates communication to find a sexual partner easily (El Kazdough et al., 2019). For example, they mentioned that WhatsApp and Facebook are facilitators that help girls and boys find a sexual partner easily. While the Internet and social media could harm youths if they engage in early sexual activities, this study suggested that governments can help youths protect themselves and improve their sexual health literacy. Media can play a positive role by raising youths' awareness about sexual health and displaying content that does not contradict the national conservative norms (El Kazdough et al., 2019). Sexually Transmitted Infections would be an important risk for female youths who have unprotected sex and low sexual health information.

Sexually Transmitted Disease Information (STI): Balbeesi and Mohizea et al. (2017) conducted a cross-sectional study on 843 women (aged 18–67 years) in Saudi Arabia to examine the participants' knowledge and conception of Sexually Transmitted Infections

(STI). They concluded that while women had various beliefs and levels of STI information, and the Internet could be a good resource for accessing that information, they did not have sufficient and accurate STI information (Balbeesi & Mohizea, 2017). They might utilize tools, such as a mobile application, to access that information easily. For example, Juyani et al. (2024) assessed the efficacy of mobile-based education on improving STI information of Iranian females. They recruited 78 females (18-49 years old) in a randomized control trial and concluded that mobile-based STI education can “increase knowledge, awareness, and preventive behaviors of women regarding STI, as well as reduce the social stigma and barriers associated with the topic” (Juyani et al., 2024, p. 15). Similarly, Kazemi et al. (2021) studied 18- to 35-year-old married Iranian women in a randomized controlled trial. Participants in the case group used a mobile application to obtain STI information. This study found a significant difference between the case and control groups in terms of women’s STI knowledge, vulnerability, prevention self-efficacy, and prevention intentions. Another Iranian Study states that web-based STI training is effective in improving the medical staff’s STI knowledge and information. Nematzadeh et al. (2024) examined 400 Iranian medical students (277 were male, 123 were female, and 39% fell within the 15–25 age bracket) in a cross-sectional study. They concluded that the level of STI information in those who use the Internet to access that information is higher (Nematzadeh et al., 2024). However, another cross-sectional study in Iran states that while the Internet is the main source of STI information (62%) among non-medical female students in Iran, visibility and accessibility of online resources are warranted (Karamouzian et al., 2017). Therefore, the Internet might be a good tool to disseminate STI information.

Diet and Lifestyle: Al-Dahshan et al. (2023) recruited 324 pregnant female youths (18-25 years: 14.8%) in a cross-sectional study in Qatar and found that more than 50% of participants use the Internet to find information related to physical activity, and 72% of them

access diet-related information. Some factors, such as lower age, education, and job, were related to a higher likelihood of Internet use among them. Therefore, they conclude that the Internet has a positive lifestyle change in pregnant female youths (Al-Dahshan et al., 2023). Similarly, Ahmadian et al. (2020) examined 385 pregnant female youths (aged <20 years: 22(6%)) in a cross-sectional study in Iran and found that they searched topics related to nutrition in pregnancy on the Internet. These studies demonstrate the positive impact of the Internet and social media platforms on enhancing the lifestyles of female youths. Therefore, awareness and digital literacy are important.

What Does this Theme Suggest about my Research Questions?

My first sub-question is: How does the Internet affect female youths' access to reproductive health information in the Middle East? Using the above-mentioned theme, I can confirm that the Internet and social media are useful tools for providing female youths with reproductive health information, including family planning, pregnancy-related Information, childbearing and delivery information, sexual health information, sexually transmitted disease information (STI), diet and lifestyle in the Middle East (Ahmadian et al., 2020; Al-Dahshan et al., 2021; Al-Dahshan et al., 2023; Al-Shdayfat et al., 2019; Bahkali et al., 2015; Bilge et al., 2023; Dawood Salim et al., 2024; Karabulutlu & Aydın, 2024; Karamouzian et al., 2017; Kazemi et al., 2021; Mousavi et al., 2022; Nabovati et al., 2023; Nematzadeh et al., 2024; Nemer et al., 2023; Öz & Güloğlu, 2023; Ozan et al., 2010; Rathfisch et al., 2012; Sayegh et al., 2023; Serçekuş et al., 2021; Uğurlu & Karahan, 2021). However, the Internet and social media might increase risky sexual behavior, such as STD, among female youths in some countries of the Middle East (El Kazdough et al., 2019). Therefore, female youth could utilize the Internet and social media to access STI in those areas (Balbeesi & Mohizea, 2017; Juyani et al., 2024; Karamouzian et al., 2017; Kazemi et al., 2021; Nematzadeh et al., 2024). These studies and themes highlighted the positive effect of the Internet and social media on female

youths' sexual and reproductive health information in the Middle East. In the next section, I present some themes related to barriers that prevent female youths from accessing that information using the Internet and social media in the Middle East.

Barriers

This theme includes four sub-themes: the “trust issue”, “ technical barriers,“ governments”, and “low digital literacy”. I explained them in the following subsections.

Trust Issue

Most studies challenged the trustworthiness of reproductive health information on the Internet and social media. Trust in online reproductive health information is important. Alomair et al. (2021) conducted a qualitative study on 28 women (aged 20-50) in Saudi Arabia and stated that female youths face challenges finding correct reproductive health information on the Internet. They might read inaccurate information, and they might worry about the quality of that information. In addition, female youths might not have the ability to evaluate the validity of that information (Alomair et al., 2021). Moreover, Serçekuş et al. (2021) conducted a cross-sectional study in Turkey. They assessed 162 pregnant women who would seek pregnancy-related information on the Internet. They state that 75% of participants thought that this information was partially reliable. In another study, Kazemi et al. (2021) announced that female youths obtain incorrect sexual health information using the Internet in Iran, and the health system needs to provide a reliable source of sexual health information using online applications. Similarly, other scholars argue about this issue in Iran. They discuss the validity and quality of reproductive health information on the Internet (Sabetghadam et al., 2022). For example, Sabetghadam et al. (2022) conducted a cross-sectional study on 337 postpartum female youths (18-25 years old: 29.7%) in Iran. They aimed to assess female youths' Maternal Health Literacy (MHL) and their health information-seeking behavior. They state that “Not all information on the Internet is proper and reliable” in Iran (p.7). Rahnavardi et al. (2008) conducted a descriptive study in Iran to assess the accuracy and coverage of

reproductive health information on Iranian websites. They concluded that comprehensive reproductive health information is difficult to find on those websites. In the discussion section, I present factors that affect the matter of trust in the domain of online reproductive health information in the Middle East.

Technical Barriers

The most important technical issue in finding reproductive health information on the Internet in the Middle East would be access to the Internet. The reasons are different. For example, Ahmadian et al. (2020) state that “expensive Internet cost” would be a barrier that prevents people from accessing reproductive health information in Iran (p.6, Table 3). In addition, Yousef et al. (2021) conducted qualitative research in Jordan. They interviewed 51 Jordanian women of reproductive age, Syrian refugees, and midwives to assess their perception of the use of the Internet for enhancing reproductive health. While they inferred that “incorporating digital technology in FP services can be feasible, cost-effective, well accepted, and potentially beneficial in increasing women’s awareness regarding the FP methods and their side effect” (Yousef et al., 2021b, p. 1), they considered the “technical errors or constant Internet disconnection” a barrier that prevents female youths in Jordan from accessing that information (p.6). Similarly, Nemer et al. (2023) state that “limited infrastructure of the Internet” in Jordan affects female youth since they cannot access reproductive health information using the Internet and social media (p.11). Finally, some governments impose technical barriers to supervising users and their access to that information. By way of illustration, Rahnavardi et al. (2008) state that “filtering” would be a barrier that the government uses to supervise the contents of the Internet in Iran: “Non-specific, word-sensitive, filtering that aims to prevent users accessing obscene or immoral material (p.4). Therefore, technical barriers could be a factor that prevents female youths from accessing reproductive health information in the Middle East.

In addition to the Internet, female youths need a device to access reproductive health information. For example, they need a computer or a smartphone to connect to the Internet. Unless they have a device, they can not access that information. According to Nematzadeh et al. (2024), not all female youths have access to smartphones in Iran (p.8). Moreover, Kazemi et al. (2021) state, “Certain political and legal limitations restricted the development of an Apple iOS-based application” in Iran (p.10). Hence, the Internet and a device are necessary for accessing reproductive health information.

Governments as Barriers

Governments are responsible for preparing correct and accessible reproductive health information on websites. The findings of this review show that some governments do not offer high-quality and valid websites. For example, Rahnavardi et al. (2008) criticize “the poor coverage percentages of the Persian websites” in Iran. They state that “good websites on reproductive health are difficult to find” (p. 5). Similarly, Nemer et al. (2023) present “lack of government commitment”, “lack of skilled professionals and experts”, and “lack of funding” as the main factors that make those websites insufficient in Jordan and Palestine. Moreover, Yousef et al. (2021) consider “Incorrect terminology or unclear sentences, especially those that are translated from one language to another” as a barrier that prevents female youths from accessing reproductive health information on the websites in Jordan (p.5). Therefore, governments would be the most important and effective agents that could prepare useful and accessible websites for female youths to access the information in the Middle East.

Low Digital Literacy as a Barrier

Digital literacy is the ability to gather information using digital health technology (Pangrazio et al., 2020). According to Alyahya et al. (2022), digital health technology has helped to overcome challenges related to the Sustainable Development Goal of “Health for all”. It has improved reproductive, maternal, newborn, and child health using mobile

applications, sensors, wearable devices, and others (Alyahya et al., 2022). It enhances female youths' reproductive health information (Meherali et al., 2021). Therefore, a low level of digital literacy prevents female youths from accessing reproductive health information.

Female youths must access correct reproductive information using the Internet and social media in the Middle East. In this sense, Uğurlu and Karahan (2022) recommend that “An officially structured web-based educational program could be a good alternative for providing sexuality education, to enable young people to access safe information about sexual health in Turkey. They should be guided on how to access reliable information” (p.6). This example shows that digital literacy and the accuracy and reliability of reproductive health information are important in the Middle East countries.

In another study conducted in Iran, Rahnavardi et al. (2008) suggest that “National policymakers may take advantage of the successful technology-assisted frameworks for integrated reproductive health training implemented in some developing countries” (p.5). Therefore, female youth should improve their digital literacy to obtain reproductive health information, and governments should help them enhance their awareness regarding digital literacy in the Middle East.

What Does this Theme Suggest about my Research Questions?

My second research question is: “What are the Internet-related barriers to female youths' access to reproductive health information? ” I found that barriers that prevent female youths from accessing reproductive health information on the Internet in the Middle East are multifaceted, including the issue of trust (Alomair et al., 2021; Kazemi et al., 2021; Rahnavardi et al., 2008; Sabetghadam et al., 2022; Serçekuş et al., 2021), technical barriers (Ahmadian et al., 2020; Kazemi et al., 2021; Nemer et al., 2023; Rahnavardi et al., 2008; Nematzadeh et al., 2024; Yousef et al., 2021), governments (Nemer et al., 2023; Rahnavardi et al., 2008; Yousef et al., 2021), and low digital literacy (Rahnavardi et al., 2008; Uğurlu &

Karahan, 2022). These themes highlight that addressing these challenges and barriers is vital to improving female youths' reproductive health information in the Middle East. In the next section, I present some themes that improve access to reproductive health information using the Internet.

Enhancing Female Youths' Access to RHI

The findings under this theme reveal four subthemes, including “accessible resources and a safe online space”, “education”, “high digital literacy”, and “female youths' empowerment”. I explain them in more detail in the following section.

Accessible Resources and a Safe Online Space

Female youths need accessible sexual and reproductive health information on the Internet and social media to improve their sexual and reproductive health literacy. Nematzadeh et al. (2024) assessed the sexual health literacy level of Iranian students and found related factors that could improve that. They state that “subscriptions to sexual health social media” (p. 6) increases the odds of sexual health literacy. In addition, “students who accessed information through channels and cyberspace” (p. 6) have a higher level of sexual health information. Therefore, governments could facilitate and supervise access to that information using the Internet within a safe cyberspace. For example, Serçekuş et al. (2021) conducted a cross-sectional study on 162 females (aged >18 years) in Turkey. They found that 92.4% of participants use the Internet as a main source of information. They state that the Internet is becoming an inseparable part of people's lives. “The widespread use of the Internet” is another facilitator that helps female youths access reproductive health information in Turkey (Serçekuş et al., 2021, p. 3). Hence, they suggested that health professionals create more reliable reproductive health information on the Internet. Similarly, Karamouzian et al. (2017) state that the Ministry of Health website of Iran has provided sexual health information in Iran that is reliable, safe, and culturally sensitive. Therefore, accessible resources and a safe

online space would be facilitators that could help female youths access reproductive health information in the Middle East.

Education

A higher level of education helps female youth access reproductive health information. For example, Al-Dahshan et al. (2023) state that employment status and tertiary education facilitate female youths' access to reproductive health information in Qatar. Education could address challenges and barriers related to the conceptualization and learning of sexual and reproductive health concepts. In this sense, Alomair et al. (2021) studied 28 females (seven participants aged 20-25) in Saudi Arabia to find their Sexual and Reproductive Health (SRH) knowledge and misconceptions. All married and unmarried participants were interviewed. They found a profound lack of SRH knowledge because of socio-cultural barriers and stated that the Internet could be a useful tool for SRH education.

Similarly, Sabetghadam et al. (2022) state that female youths' education is related to maternal health literacy in Iran. They considered education as a facilitator that improves reproductive health. In another Iranian study, Nabovati et al. (2023) studied 168 Iranian females (52 participants (32.9%) were under 25 years old) in a cross-sectional study. While they stated that pregnant female youths are interested in using the Internet and mobile applications for obtaining reproductive health information, including pregnancy-related information, they found that educational level is a facilitator that improves reproductive health information. In addition, Ahmadian et al. (2020) suggest that Iran needs a high priority in the reproductive health-related educational program since education is a facilitator that helps Iranian female youths access reproductive health information. Similarly, Karabulutlu and Aydın (2024) state that medical staff can train female youth to utilize the Internet to access reproductive health information and encourage midwives and nurses to educate and follow up pregnant female youths in Turkey.

High Digital Literacy

Female youths need digital literacy to access reliable reproductive health information (Nabovati et al., 2023). Nabovati et al. (2023) state that Iranian pregnant female youths need a high level of digital health literacy and should be advised by healthcare providers on utilizing the Internet and social media to improve their reproductive health information, including pregnancy-related information. In addition, they suggested that obstetricians and gynecologists could participate in presenting valid reproductive health resources and creating the content of digital resources, such as websites and smartphone apps. Moreover, age plays an important role in accessing that information online. Female youths could utilize the Internet more easily. Alomair et al. (2021) conducted qualitative semi-structured interviews with Arab female youths in Saudi Arabia. They compared female youths' knowledge about sexual and reproductive health and found that different generations have different levels of sexual and reproductive health knowledge. "The availability of the Internet and technology, and the use of social media were often cited as the main reason for these differences in knowledge across generations" (Alomair et al., 2021, p. 8). Therefore, they concluded that the new generation is better at accessing sexual health information using the Internet. However, female youths need to find reliable and correct information. In this sense, Al-Dahshan et al. (2021) designed a cross-sectional study to find the prevalence of female youths who seek pregnancy-related information on the Internet in Qatar. While they found the Internet as a main resource of that information and younger females could utilize that, they state, "The credibility of this information varies widely among different sources, and it becomes the responsibility of the consumer to navigate, seek, and validate it" (p.5). Therefore, it is necessary to improve the digital literacy of female youths in the Middle East. A high level of digital literacy could help female youths to access reproductive health information using the Internet in the Middle East.

Female Youths' Empowerment

Female youths should be empowered through technology to access reproductive health information easily. According to Al-Dahshan et al. (2023), the Internet has a significant impact on females' empowerment in Qatar. They stated that pregnant female youths could access online resources to be empowered, make informed decisions, and enhance overall maternal and fetal well-being. They need digital technology to be empowered. In this context, Yousef et al. (2021) state that digital technology helps empower female youths and enables them to make better decisions for family planning in Jordan. However, they mentioned concerns regarding digital literacy and the reliability of reproductive health information on the Internet. Hence, they asked health professionals, such as midwives, to help female youths increase their awareness regarding the reliability of that information.

Support from medical staff can help female youths be empowered. In a recent cross-sectional study, Al-Dahshan et al. (2021) found that two-thirds (64.4%) of pregnant female youths recognized their healthcare providers as the main source of pregnancy-related information in Qatar. They state: "Pregnant women are a vulnerable cohort and must be empowered with the proper skills to access online health information and encouraged to discuss this information with their health care providers" (p. 5). They also recommend that medical staff identify and suggest reliable reproductive health resources to pregnant female youths in Qatar. These resources should be comprehensive, user-friendly, and culturally appropriate (Al-Dahshan et al., 2021). Similarly, Nabovati et al. (2023) asked healthcare providers to advise female youth on using technology for accessing reproductive health information in Iran. In this sense, Sabetghadam et al. (2022) suggested that healthcare providers should know females' interests and empower them to find high-quality online reproductive health information in Iran. Using parental education and providing evidence-based information, for example, they can empower pregnant female youths to make informed

decisions (Sabetghadam et al., 2022). In addition, Juyani et al. (2024) mentioned that a mobile application can improve the knowledge, awareness, and preventive behaviors of Iranian female youths regarding STI, resulting in female youths' empowerment. Therefore, female youths have to be empowered to access reliable sexual and reproductive health information using the Internet in the Middle East.

What Does this Theme Suggest about my Research Questions?

My third question is: How can female youths' access to reproductive health information be improved? Based on my findings, accessible resources and a safe online space would be facilitators that could help female youths access reproductive health information in the Middle East (Karamouzian et al., 2017; Nematzadeh et al., 2024; Serçekuş et al., 2021). However, they need skills to utilize the Internet and access that information. A high level of digital literacy is helpful for female youths in the Middle East (Alomair et al., 2021; Al-Dahshan et al., 2021; Nabovati et al., 2023). Besides, education is another factor that helps female youths to access reliable and accurate reproductive health information in that area (Ahmadian et al., 2020; Al-Dahshan et al., 2023; Alomair et al., 2021; Karabulutlu & Aydın, 2024; Nabovati et al., 2023; Sabetghadam et al., 2022). Therefore, both factors help female youths not only to access but also to identify reliable and correct reproductive health information. Hence, it is necessary to improve female youths' digital literacy and their level of education in the Middle East. In addition, female youths' empowerment could help them to access reproductive health information using the Internet in the Middle East (Al-Dahshan et al., 2021; Al-Dahshan et al., 2023; Juyani et al., 2024; Nabovati et al., 2023; Sabetghadam et al., 2022; Yousef et al., 2021).

Chapter Five- Discussion

My research question was “What is the role of the Internet in providing reproductive health information to female youths in the Middle East?”. I could answer my main sub-questions by finding some themes in this literature review. This chapter will discuss these themes and their application to my sub-questions to achieve the research objectives.

1) The Effects of the Internet on Female Youths' Reproductive Health Information

Based on my findings, I can confirm that female youth can have access to reproductive health information using the Internet and social media in the Middle East. All included studies proved that the Internet and social media are useful tools for finding reproductive health information, sexual health information, or reproductive health services in the Middle East. Therefore, the Internet and social media would be good options when that information is not accessible, available, and acceptable in some countries in the Middle East.

Let's take Jordan as an example. Yousef et al. (2021) state that some barriers including “religious opposition, perceived social pressure from family members, language barriers in dealing with local health care providers; availability of services and accessibility barriers include, for example, distance from health care facilities and costs of transport and a doctor’s consultation” prevent female youths from accessing family planning information and service among Syrian refugees in Jordan (p. 2). Therefore, they can utilize digital technology to access that information. According to Yousef et al. (2021), it is “feasible, cost-effective, well-accepted, and potentially beneficial in increasing women’s awareness regarding the family planning methods and their side effects” (p.1). Hence, the Internet and social media positively provide reproductive health information in the Middle East.

Some publications recommend that the Internet and social media are useful tools for accessing reproductive health information in rural areas of the Middle East. For example, Bahkali et al. (2015) state that “Women living in rural areas of Saudi Arabia will benefit from the use of social media to communicate with healthcare professionals about women's

health issues, especially women who are socially disadvantaged in accessing reproductive health information” (p. 4) Therefore, female youths need to access some digital platforms to utilize the Internet and access reproductive health information in the Middle East.

This review revealed that female youths can have access to childbearing, pregnancy-related, and delivery information using the Internet and social media in the Middle East. This result aligns with one reproductive health rights concept: “making decisions about childbearing.” (World Health Organization, 2018). Therefore, the Internet and social media could be available tools for pregnant female youths to obtain pregnancy-related information in the Middle East. However, pregnancy and delivery are sensitive stages for female youths. In this context, Al-Dahshan et al. (2023) state, “ Future research should focus on conducting longitudinal studies to assess the long-term impact of Internet use on pregnancy, dietary behaviors, and maternal and fetal outcomes, providing valuable insights into the sustainability and effectiveness of online interventions during pregnancy” (p.7). Hence, more research is necessary to prove that the Internet and social media are reliable resources for accessing pregnancy-related information in the Middle East.

Another concept of reproductive health rights is “having sex without any discrimination and violence.” (World Health Organization, 2018). Based on our findings, female youth should find sexual health and STD information on the Internet and social media in the Middle East. Therefore, the Internet and social media help female youths achieve their reproductive health rights by providing access to information and resources in that area. However, female youths need to find reliable and correct reproductive health information on the Internet in the Middle East.

Female youths' empowerment and autonomy were other themes that are aligned with “being able to build a family and having a satisfying and safe relationship without any discrimination or violence” and “choosing to get married or not” concepts of reproductive

health rights (World Health Organization, 2018). By focusing on them, we can confirm that the Internet and social media are useful tools that could empower female youths to build their sexual lives by themselves in the Middle East.

In addition, female youths could utilize the Internet and social media to obtain family planning (FP) information or services, which is another important concept of reproductive health rights (World Health Organization, 2018). Yousef et al. (2021) state, “Digital technologies are recommended to address the challenges faced in the health system and to improve both the coverage and quality of FP services and practices” (p. 2). Therefore, the Internet and social media are useful tools that improve family planning information or services in the Middle East.

Moreover, female youth can have access to healthcare systems and healthcare providers using the Internet and social media in the Middle East. “Having access to health information and education” is a women’s reproductive health right (World Health Organization, 2018). In this sense, Yousef et al. (2021) recommend that clients and medical staff link with each other using mobile applications. Similarly, Öz and Güloğlu (2023) state, “Nurses should be expert users of social media, putting the patient-nurse relationship at the center of care (p. 17). Hence, medical staff should have a high level of digital literacy to connect with clients online, build a good relationship with them, and help them. In addition, Internet-based interventions are other developing services of the health system in the Middle East. For example, Serçekuş et al. (2021) suggested a new antenatal care model using the Internet in Turkey. However, they noticed that the potential harm should be carefully considered.

In addition to the concepts of reproductive health, I identified connections between the study's findings and the Sustainable Development Goals (SDGs) (United Nations, 2015). For example, SGD 3 is related to good health and well-being. Target 7 of this goal emphasizes

universal access to sexual and reproductive health, including family planning and education, which is aligned with the first theme of this study. Moreover, target 3.8 asks for universal health coverage that is safe, equal, and affordable for all. As a result, SDG expects to reduce Maternal Mortality Rate (MMR) by less than 70 per 100,000 live births by 2030 (Target 3.1), and to end preventable deaths of newborns and children under 5 years of age (Target 3.2). In addition, target 2.2 puts forward concepts related to nutrition. It asks for ending all forms of malnutrition and addressing the needs and problems of female youths and pregnant women, which is aligned with the first theme of this study (United Nations, 2015). This study confirms that the Internet would be a useful tool for achieving these goals in the Middle East. In the next paragraph, I will discuss how female youths find reliable reproductive health information on the Internet and social media.

2) Internet-Related Barriers to Female Youths' Access to Reproductive Health Information

Trust issue

It seems that the matter of trust in reproductive health information on the Internet and social media is complex and might depend on several factors, such as the type of reproductive health information, resources, and online tools. In this sense, Bahkali et al. (2015) conducted a study entitled "The Role of Social Media in Promoting Women's Health Education in Saudi Arabia". They claimed that "it is difficult to verify the user identities and demographic information using social media." (Bahkali, Ahmad, et al., 2015, p. 4). In addition, Al-Shdayfat et al. (2019) support the recent claim in their qualitative study in Jordan. They revealed that "Unmonitored Internet" might pose a significant risk of unreliable and incorrect reproductive health information (5). However, monitoring and filtering the Internet might cause another barrier, as a technical barrier.

Technical barriers

This study shows that female youth might have a problem using the Internet and devices for accessing reproductive health information in some regions of the Middle East. For example, “expensive Internet cost”, “technical errors or constant Internet disconnection” (Yousef et al., 2021b, p. 6), “limited infrastructure of the Internet” (Al-Dahshan et al., 2023) (Nemer et al., 2023, p. 11), “filtering” (Rahnavardi et al., 2008, p. 4), and “the lack of access to smartphones” (Nematzadeh et al., 2024, p. 8) are barriers that prevent female youths from accessing that information in the Middle East.

According to Consalvo (2012), not all women have access to the Internet and technology. Those who are not from privileged middle-class backgrounds, such as Western (and often white), might have challenges accessing technology, such as high-quality Internet and affordable devices to connect to the Internet. Therefore, we have to be realistic when applying the Cyberfeminism framework in the Middle East. Female youths need the power to utilize technology and achieve their rights, including reproductive health information. One branch of cyberfeminism supports this claim. It argues that women gain authority and power using the new media technology. They are part of the community and the future; hence, they have to engage with technology. This branch declares that “all girls need modems” (Consalvo, 2012).

Governments

This study confirms that governments are responsible for preparing correct and accessible reproductive health information in the Middle East. However, they might not commit to providing correct, high-quality, and reliable reproductive health information in some regions of the Middle East. The reasons are manifold.

First of all, in the Middle East, patriarchal systems and governments might not agree with women’s empowerment due to various factors. These include traditional interpretations

of societies or cultural practices that prioritize male authority, social and family structures that emphasize family honor and male dominance, a lack of legal protections that hinder women's access to education, employment, and healthcare, and entrenched power dynamics that are unwilling to relinquish control or challenge traditional gender roles. According to Multani (2023), cyberfeminism challenges male dominance and patriarchal hegemony in societies. The Internet would be liberating for women in this millennium. Therefore, governments would rather prevent female youth from accessing their rights using the Internet in the Middle East.

In addition, governments filter the Internet because of some political issues in the Middle East. Therefore, female youths might have limited access to the Internet and their rights. For example, governments block social media or monitor the content on the Internet since critical voices or opposition groups use them for protest, exchange of information, and connection. Wagner and Gainous (2013) indicated that the Internet enhances people's political knowledge and participation and hurts trust in governments in the Middle Eastern countries. Therefore, the governments of those countries filter the Internet (Wagner & Gainous, 2013). Consequently, female youth have restricted access to the Internet in the Middle East.

Moreover, some countries in the Middle East hold conservative cultural values. Muslim societies rarely discuss topics related to sexual and reproductive health (Alomair et al., 2020). Alomair et al. designed a systematic review to identify any personal, religious, cultural, or structural barriers to SRH service and education among Muslim women worldwide. They found some themes. For example, they state that religion affects personal beliefs about sexual and reproductive health education in societies of the Middle East. Some women think that religious practice is enough to fight against STI.

In addition, some Muslim societies assume that sexual and reproductive health education is not necessary for unmarried youths. They highlight that sexual and reproductive health education should be tailored based on Muslim women's needs (Alomair et al., 2020).

However, a few leaders disagree with this approach. For example, a religious leader in the Middle East stated: "People who think that sex education isn't permitted in religion are completely wrong, but such knowledge should be taught in a way that informs adolescents about sexuality in a modest and moral manner." (Alomair et al., 2020, p. 6). Therefore, it is important to have an education within the boundaries of Islam and provide culturally and religiously sensitive education in Islamic countries (Alomair et al., 2020).

Another factor that affects societies and governments in the Middle East would be cultural norms. Sexual and reproductive health content might be a cultural taboo in some cultures. Cultural taboos prevent female youths from accessing reproductive health information in some countries of the Middle East (Juyani et al., 2024). By way of illustration, scientific topics related to sexual and reproductive health information might be "Westernization" and could result in cultural erosion in those countries. Therefore, societies and governments prefer to limit sexual and reproductive health information, such as unwanted pregnancy and abortion, violence against women, and STIs/HIV/AIDS in the Middle East (DeJong et al., 2005).

Low Digital literacy

This study shows that low digital literacy is an important factor that prevents female youths from accessing reproductive health information in the Middle East. Digital literacy is an important concept in cyberfeminism. Cyberfeminism refers to the intersection of digital technology and feminism. If female youth suffer from low digital literacy, they cannot promote gender equality and change the patriarchal patterns of society (Issac, 2023).

According to Tilak and Jadhav (2023), social media, as a platform that disseminates feminist

ideology, serves as a tool that helps female youths connect and move toward gender equality and women's empowerment. It transcends geographical boundaries and helps women to actively engage in challenges related to societal norms (Tilak & Jadhav, 2023). Women need digital literacy to utilize different tools and technology. Digital skills and literacy could help them to use electronic devices and navigate digital space (Raihan et al., 2024). In addition, Raihan et al. consider "information navigation literacy" another factor that helps women use a safe cyberspace. In this sense, women with low digital and information navigation literacy cannot use devices, find desired digital services, and navigate safe digital spaces.

Some factors affect digital health literacy. For example, Peng and Yu (2022) conducted research and presented a literature review of students' digital literacy. They concluded that age, gender, family socioeconomic status, and parents' education level are the main factors that affect students' digital literacy (Peng & Yu, 2022). Digital literacy is crucial for female youths to access reproductive health in the Middle East since digital health technology is becoming common in different countries.

For example, a recent scoping review has examined 80 studies using thematic appraisal. It reveals that digital health technology positively helps women access health-care services. In addition, it improves women's empowerment and gender equality (Borges Do Nascimento et al., 2025). This review is in agreement with our findings.

The Global Initiative on Digital Health (GIDH) has emerged to help people all over the world have healthy lives and well-being. WHO has proposed GIDH to manage a network including organizations, institutions, and government technical agencies that are in charge of supporting national digital health transformation. Accordingly, GIDS aims at focusing country-level efforts using national resources, collaborations, and knowledge exchange for country-led digital health transformation (World Health Organization, 2024). The countries in

the Middle East should follow this initiative to achieve their objectives through collaborative efforts.

GIDS should achieve the objectives of the Global Strategy on Digital Health 2020-2025. One of these objectives is aligned with the digital health literacy theme in this study: “This strategic objective advances digital health literacy, gender equality and women’s empowerment and inclusive approaches to adoption and management of digital health technologies.” (World Health Organization, 2021, p. 26) Therefore, the governments of the Middle East and GIDS should follow these objectives and try to address challenges and problems related to the barriers that prevent female youths from accessing reproductive health information in the Middle East, such as low digital literacy. We need more studies to find factors that affect female youths’ digital literacy in the Middle East.

3) Factors that Help Female Youths Improve their Access to Reproductive Health Information

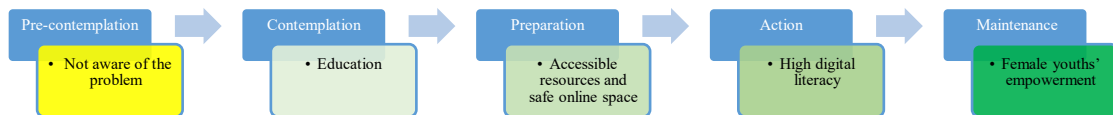
I discussed factors that prevent female youths from accessing reproductive health information in the Middle East using the Internet. In addition, this study suggested some themes that help them access that information, including education, accessible resources, and safe online space, high digital literacy, and female youths’ empowerment. Here, I present a model that could be aligned with those themes and might help female youth access reproductive health information in the Middle East.

I apply the transtheoretical model of change to my research. Prochaska et al. proposed this model in 1998 (Velicer et al., 1998) that explains the stages of change in health behavior, employing different psychological theories. Prochaska explored some psychological concepts, such as an individual's emotions, actions, and perceptions about health behaviors that affect people's health behaviors (Velicer et al., 1998). Based on the transtheoretical model, individuals make a decision intentionally (Velicer et al., 1998).

The transtheoretical model explains that knowing and thinking about a health concept is not equivalent to health behavior. According to this model, people are in one of these five stages when they face a problem: pre-contemplation (not aware of the problem), contemplation, preparation (deciding to take action), action, and maintenance (Velicer et al., 1998). Therefore, in the realm of reproductive health, children and female youth have different levels of reproductive health knowledge and face various reproductive health issues, based on the stage they are in. I aligned these stages with themes that could help female youths access reproductive health information using the Internet and social media in the Middle East. Figure 2 shows different stages.

Figure 2

Different stages of the transtheoretical model of change aligned with themes



Pre-contemplation

In the pre-contemplation stage, female youths are not aware of the problem (Velicer et al., 1998). In the realm of my research, female youths are not completely aware of their reproductive health rights in the Middle East. Therefore, they do not have reliable and sufficient reproductive health information. On the other hand, not all female youths have access to the Internet and social media in some regions of the Middle East, although they are useful tools.

According to Molina (2021), males are more frequent Internet users, while women face barriers that inhibit them from accessing the Internet, including financial problems, time, confidence, and computer literacy, etc. In addition, women might experience misogyny and sexism in cyberspace, and their participation is less than men on the Internet (Molina, 2021). Therefore, we should help female youths participate more in cyberspace and be powerful in achieving their rights, including reproductive health information. “Education”, which is one of these research themes, could help them contemplate the problem and seek reproductive health information by themselves.

Contemplation

I align the education theme with the contemplation stage of the transtheoretical model of change since higher education increases female youths’ awareness and critical thinking. Education helps female youths to recognize their reproductive health rights, how to access them, and what are main resources, including the Internet and social media. They can weigh the pros and cons of reproductive health information available online, considering cultural expectations, social norms, and traditional taboos. Then, they can decide to take action and access reproductive health information using the Internet.

Preparation

In this stage, female youths should prepare to take action (Velicer et al., 1998) need “accessible resources and safe online space” to make sure that they can go online without the fear of any risk of hurt, wrong information, privacy concerns, social stigma, judgment, or extra costs.

The first key element of this stage is “accessible and reliable reproductive health information”. According to Nematzadeh et al. (2024), having access to and subscription to social media platforms and cyberspace-based resources could improve their understanding. However, female youths need trustworthy content.

In addition, creating a safe online space is the other key element. Safety, which is a big concern for female youths while seeking reproductive health information, needs a strong digital policy and protection. It secures their privacy and security. Scholars believe that governments, educators, and institutes are responsible for creating a safe online space with reliable information (Al-Dahshan et al., 2021; Karamouzian et al., 2017; Serçekuş et al., 2021). However, female youth need digital literacy to take action.

Action

The action stage refers to when individuals actively modify their actions (Velicer et al., 1998). In this stage, female youths practice going online and finding their reproductive health information. According to the findings of this study, they need a high level of digital literacy to actively apply that skill and find reliable and correct reproductive health information in the Middle East.

According to Lee (2014), digital literacy is an important concept in this digital society. He states that marginalized groups have a low level of digital literacy, and it is a vicious circle, and they will be further marginalized. The reason is that governments and societies structure information, communication, businesses, and social functions on the Internet (Lee, 2014). Therefore, he considers digital literacy education as a key factor that supports people's knowledge and skills to enhance their digital literacy to prevent marginalization. In this sense, he conducted a study in the United States. He measured the relationship between the level of participants' digital literacy before and after digital literacy training. Results showed that participants' digital literacy improved as a result of digital literacy training. Hence, digital literacy education in marginalized groups and remote areas should be considered as a part of the cyberfeminism movement.

Therefore, female youths could make a sustained behavioral change using digital literacy in the Middle East. Using the Internet and social media, skilled female youths have

better reproductive health knowledge, informed decision-making, and autonomy in that region.

Maintenance

This stage focuses on sustaining behavioral change. It prevents relapse to previous stages (Velicer et al., 1998). I aligned this stage with “female youths' empowerment” since female youths need empowerment for the ongoing detection of reliable online reproductive health information. They need knowledge and skills, sustaining access to reliable reproductive health information, autonomy, medical staff support, and connection to be updated and utilize the Internet and social media to access reproductive health information in the Middle East (Al-Dahshan et al., 2021; Nabovati et al., 2023).

In terms of women's empowerment and gender equality, the SDGs suggested a few goals in targets 5 and 10 (United Nations, 2015). Targets 5.1 -5.6 are the core goals for women's empowerment. It asks for the end of all forms of discrimination, violation, and harmful practices against women and girls, unpaid jobs, as well as offering equal opportunities for leadership and participation in social activities (United Nations, 2015). Additionally, target 10.2 aims to empower and promote people's social, economic, and political inclusion, regardless of sex and age (United Nations, 2015). Female youths' empowerment as a subtheme of this study advocates for these goals, confirming the positive effect of the Internet and social media for accessing reproductive health information in the Middle East.

In summary, education, accessible resources, and a safe online space, high digital literacy, and female youths' empowerment are key factors that help female youth access reproductive health in the Middle East. If we apply them as the main stages of the transtheoretical model of change, we can enhance the level of female youths' reproductive health information in the Middle East.

Chapter Five- Limitations and Concluding Thoughts

Limitations

My systematic review aimed to review included studies and find some themes. Therefore, it does not provide quantitative data, such as the prevalence of internet usage, different social media applications, or barriers. Because of the small number of eligible studies and various methodologies, I could not discuss and categorize the qualitative data. In addition, qualitative data were inconsistent and scattered within those studies; hence, it was difficult to summarize them meaningfully. Therefore, this study focused on Thematic Analysis and themes rather than statistical reports.

The quality of eligible studies in this systematic review varies and affects the quality of my systematic review (Schlosser, 2007). To address this, I assessed the trustworthiness of qualitative studies, as well as the assessment of quantitative studies, considering the credibility, dependability, confirmability, and transferability of qualitative studies and the validity, reliability, objectivity, and generalization of quantitative studies (Connelly, 2016).

Like any other systematic review, this study had limitations, including various forms of bias (Pati & Lorusso, 2017). These biases include inadequate blinding, selective outcome reporting, and publication bias, to name but a few (Owens, 2021). I considered the precise assessment of any potential risk at any stage to improve the credibility of this research (Pati & Lorusso, 2017) and addressed the mentioned biases (Mathur & VanderWeele, 2022). In terms of publication bias, I had overrepresentation of studies conducted in Iran and Turkey. Therefore, findings might not be representative of the all region of the Middle East.

The other limitation was language bias. In this research, English resources and studies belong to the Middle East were used. Grzybowski and Kanclerz (2019) state that language bias has dwindled because researchers conduct and publish studies in English with a good methodology, double-blind peer review, and sample size (Grzybowski & Kanclerz, 2019). I missed some valuable, relevant studies since I excluded non-English publications to increase

feasibility and accessibility. In other words, while excluding non-English publications reduced the risk of misinterpretation, it also reduced the comprehensiveness of this review.

Strengths

I considered three strengths for this study. First and foremost, my motivation as a female researcher from the Middle East empowers this study. Second, I work with the University of Victoria and the CYC department with a high-technology educational system and experienced lecturers, instructors, and professors. If I were in my country, I would not be able to do research without any limitations and restrictions in this field, and utilize the lecturer's experiences. The third strength is related to the nature of a systematic review.

A systematic review has a comprehensive conclusion that links theories to evidence. That is, a good systematic review is transparent, precise, and replicable (Owens, 2021). A systematic review lowers the bias and concludes systematically. It is useful for doing evidence-based practice, exploring specific and state-of-the-art questions, such as the question of my study, identifying gaps, and generating new ideas for further studies (Schlosser, 2007). Therefore, my systematic review has some strengths that could positively change the reproductive health information in the Middle East. To our knowledge, this was the first systematic review that assessed the role of the Internet in providing reproductive health information to female youths in the Middle East. I hope we can utilize it in further studies to enhance the reproductive health condition of female youths in the Middle East using digital technology and cyberfeminism.

Concluding Thoughts

This study highlighted the positive impact of the Internet and social media on female youths' access to reproductive health information and services in the Middle East. However, some barriers, including the issue of trust, technical barriers, governments, and low digital literacy, prevent female youths from accessing that information using the Internet and social

media in that area. In this sense, this study suggested some themes, including accessible resources and a safe online space, education, high digital literacy, and female youths' empowerment, that could help female youths access reproductive health information. We can create an inclusive and effective digital space for enhancing reproductive health information among female youths in the Middle East by addressing these barriers and utilizing facilitators.

This study aligned different stages of the transtheoretical model of change with themes that facilitate the use of the Internet and social media to access reproductive health information. Female youths' awareness about their rights and reproductive health information, preparing a safe online environment and reliable resources, planning digital literacy programs, and empowering female youths to act and gather reliable information using the Internet and social media are the main steps that help female youths access reproductive health information in the Middle East. Further research could explore the long-term impact of these interventions in the Middle East.

Policy Implications and Recommendations

We can utilize the results of this study to make some policies in the countries of the Middle East. The governments, Non-Governmental Organizations (NGOs), and digital health providers can apply them in their policies. Governments need to focus on the WHO reproductive health standards while integrating them with culturally and religiously sensitive reproductive health education. For example, they can integrate digital health literacy programs into the school curriculum or ongoing training in organizations. In addition, they have to expand digital infrastructure, particularly in rural and remote areas in particular, and reduce additional filtering. NGOs can plan to offer mobile-based telehealth services for family planning, sexual health, and pregnancy care in marginalized areas. Online platforms and tools should be supervised by digital health providers. They must offer reliable, accurate, and accessible reproductive health information to female youths.

Suggestions for Future Research

This review offers some suggestions for future research. The countries of the Middle East could design empirical and longitudinal studies to find the long-term impact of Internet-based interventions on reproductive health information in the Middle East. Moreover, they can carry on comparative studies that examine mobile application-based reproductive health education and in-person training in the remote areas of the Middle East. Finally, some text-based research related to the facilitators that help female youths find their reproductive health information in the Global North may also apply to the Global South, such as the countries in the Middle East, and could provide new ideas for their studies.

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Appendix

Appendix 1, JBI Critical Appraisal Checklist for Qualitative Research

Reviewer -----	-----			
	Date			
Author -----	-----			
	Year		Record	
Number	Yes	No	Unclear	Not applicable
1. Is there congruity between the stated philosophical perspective and the research methodology?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Is there congruity between the research methodology and the research question or objectives?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Is there congruity between the research methodology and the methods used to collect data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Is there congruity between the research methodology and the representation and analysis of data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Is there congruity between the research methodology and the interpretation of results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Is there a statement locating the researcher culturally or theoretically?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Is the influence of the researcher on the research, and vice-versa, addressed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Are participants, and their voices, adequately represented?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Is the research ethical according to current criteria or, for recent studies, and is there evidence of ethical approval by an appropriate body?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Do the conclusions drawn in the research report flow from the analysis, or interpretation, of the data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Overall appraisal:	Include <input type="checkbox"/>	Exclude <input type="checkbox"/>	Seek further info <input type="checkbox"/>	
Comments (Including reason for exclusion)				