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Andersen's Health Behavioral Model of Health in Reproductive Maternal Health Services: A Narrative Review from 2012-2024

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Abstract

This ***s***tudy explores and examined the application of health behavioral model by Ronald M. Andersen. The model breaks things into three primary variables, such as predisposing factors, enabling factors, and need factors. Such a review would help us understand how widely the model is being used, what methods are being used by researchers and where more research is needed. *This* current study is a narrative review and aims to evaluate the use and execution of the behavioral model of health services use developed by Ronald M. Andersen that was published from 2012 to 2024. *This* study is the content-based secondary literature review. In July 2025, we conducted a secondary literature search on PubMed, Google Scholar and ScienceDirect. Eligible studies that applied Andersen's Behavioral Model in reproductive or maternal healthcare were included. Data were extracted and synthesized narratively according to the model's three core domains: predisposing, enabling, and need factors. Andersen's behavioral model of health services utilization was applied in the studies as a guide to help understand why people seek or do not pursue medical attention. In 15 out of 15 studies, age was the reason why people used or did not use healthcare. How many people had the main thing that helped them get to healthcare in 13 out of 15 studies? Whether people thought they needed healthcare was the main reason why they used healthcare in 14 out of 15 studies. The studies mostly concentrated on women who are of reproductive age. The studies also showed that women are more likely to use healthcare than men when it comes to health. This model can help policymakers and people who design programs identify things that might stop people from using healthcare and things that might help them use it. As a whole, the results show that getting reproductive and maternal healthcare is not influenced by one thing but by many factors, like social, cultural, economic and structural issues.

Key Words: Behavioral Model, Maternal health, Health Services Utilization and Reproductive health.

Introduction

Behavioral Model by Ronald M. Andersen is one of the most known ways to understand why people use healthcare services (Kehrer, 1972). The model breaks things into three primary variables that tend to make something likely to happen (predisposing factors), elements that make it possible for something to happen (enabling factors), and factors that indicate a need for something to happen (need factors). All these components work together to explain how and why a person may choose to seek medical care (Andersen, 1995). This approach has been used to address a wide range of health-related problems, including preventative healthcare, chronic illness management, and maternity and infant health.

The model is especially useful for investigating the implications of social and economic factors on women's access to healthcare, especially in time of pregnancy and child delivery (Andersen & Newman, 1973). This model has become very important for researchers and policymakers who want to improve healthcare need (Kabir, 2021) since there are still big differences in maternal health outcomes around the world especially in lower income areas. In all, Andersen's model has been extensively used in the last decade. Such a kind of review would help us understand how widely the model is being used, what methods are being used by researchers and where more research is needed. A theoretical framework is essential for maternal health and reproductive health-related studies (Islam et al., 2026). Andersen's model is a crucial model of health-related studies as a whole all over the world.

Andersen's model basically based on three main things that affect healthcare use. First, there are predisposing factors, including a person's age, social background, and beliefs about health, which determine whether they are likely to seek care. then things that make them possible are like income insurance are healthcare services that are available to them. Finally, need factors are to do with perceived level of ill health, or the main reasons given by healthcare professionals for people actually using healthcare. Together these ideas give a clear picture of why different people use health services differently (Andersen, 1995).

The intention of this narrative review is to evaluate the implementation of Andersen's Behavioral Model of Health Services in studies that published from 2012 to 2024, with a focus on maternal and reproductive healthcare. Using recent research, it hopes to better understand healthcare utilization and inform strategies to improve maternal health outcomes globally.

Objectives

This narrative review aims to evaluate the use and application of the Behavioral Model of Health Services use developed by Ronald M. Andersen in reproductive and maternal healthcare studies published between 2012 and 2024.

Methodology

Study approach

This narrative study was conducted to examine the way of Andersen's Behavioral Model of Health Services Use applied in reproductive and maternal healthcare research. A structured literature search was performed to explore relevant reviewed articles which published in English between January 2012 and December 2024. This review also aimed to synthesize existing evidence on the search application of Andersen's model and to identify the predisposing, enabling, and need factors associated with reproductive and maternal healthcare utilization.

Search strategy

The literature was thoroughly searched in Science Direct, Google Scholar, and PubMed. In July 2025, the was conducted using predefined search terms related to Andersen's Behavioral Model and maternal and reproductive healthcare. Boolean operators AND and OR were used to merge keywords. The primary search phrases were "Andersen's Behavioral Model," "Andersen's Behavioral Model of Health Services Use," "Andersen model," "maternal healthcare," "maternal health," "reproductive healthcare," as well as "reproductive health." To ensure to find further relevant studies, the reference lists of eligible papers were also carefully examined.

Inclusion & Exclusion criteria

Research published in English between 2012 and 2024 based on the use of Andersen's Behavioral Model of Health Services meets the criteria for inclusion. All these included studies used as the primary or one of the conceptual frameworks and were accessible as full-text research articles with an emphasis on the use of maternal or reproductive healthcare. Exclusion studies included conference abstracts, editorials, comments, dissertations, and other forms of grey literature; did not use Andersen's Behavioral Model; focused on medical topics unrelated to maternal or reproductive health; and were not published in English.

Study selection

The identified records were screened in three stages: title screening, abstract screening, and full-text review. The eligibility criteria were applied at each stage to identify relevant studies. Following the screening process, 15 studies met the eligibility criteria and were included in the final review.

Data extraction

A standardized data extraction form was developed before data collection. Information extracted from each study included the author, publication year, country, study design, study setting, study population, healthcare outcome, and the application of Andersen's Behavioral Model. Variables reported in the included studies were subsequently organized according to Andersen's three core domains: predisposing factors, enabling factors, and need factors.

Data synthesis

Due to the heterogeneity of study design, population, healthcare setting and outcome measures across the included studies, a quantitative synthesis or meta-analysis was not appropriate. Thus, a narrative synthesis was performed. The findings of the studies were compared to identify common patterns in application of Andersen’s Behavioral Model and provide an overview of predisposing, enabling and need factors associated with reproductive and maternal healthcare utilization. The similarities, differences and variations in the operationalization of the model were also examined.

Result

Study characteristics and Characteristics of the study populations

The main study characteristics of the 15 studies included in this narrative review are detailed in Table 1. The total of 15 articles were published between 2012-2024 and conducted in difference settings. Secondary data, primarily from national survey, demographic survey and health survey. The 15 studies took place in different site, on different kinds of people, used different methods, and included different kinds of variables in the model's three main parts: predisposition, enabling, and need factors.

Study settings: The majority of the studies were carried out in African countries (n = 7), including Nigeria (2), Uganda (2), Ethiopia (1), and Malawi (2). Another seven studies (n = 7) were conducted in Asian countries, including Bangladesh (2), Nepal (1), India (1), Pakistan (1), China (1), and Papua New Guinea (1). One study was conducted in the United States (n = 1). All the included studies covered both rural and urban area and represented a wide range of socio-cultural and healthcare contexts, demonstrating the application of Andersen's Behavioral Model in reproductive and maternal healthcare study.

Sample size: The reviewed studies included in this study varied widely in sample scale, from as few as 213 participants in small scale, community-based surveys to over 20,000 participants in large scale, nationally exemplary datasets such as the Demographic and Health Surveys (DHS).

Gender: As all the selected studies were conducted on reproductive and maternal health, the majority focused exclusively on women of reproductive age. Some targeted more specific subgroups, such as adolescent girls, postpartum women, or women with recent birth histories. Only one out of the fifteen studies included both male and female participants.

Age range of the participant:

The main population for this research on maternal and reproductive health is women reproductive age and the age range is (15-49) years and majority of the selected study also focused on this range. Many studies explicitly sampled only women (e.g., Adewuyi et al., 2024; Kabir, 2021; Wang et al., 2015; Li et al., 2023) while a few expanded to include both male and female participants (Mbalinda et al., 2020) and others focused on a narrower age range such as adolescent girls aged 15–18 years (Azfredrick, 2016).

Population Description: The populations studied are from different settings such as rural and urban areas, often at national levels through demographic and health surveys in countries like Nigeria, Bangladesh, Nepal, Malawi, and India (Neupane et al., 2020; Sreeramareddy et al., 2012). Other studies are limited to specific regions or communities like rural provinces in China and Ethiopia or the Northern Plains region in the United States (Yang & Yu, 2023; Kloos, 2020; Roh et al., 2023). Some studies also focused on specific groups, such as patients attending antiretroviral therapy clinics or adolescent girls in secondary schools (Mbalinda et al., 2020; Azfredrick, 2016). At last, one study used a scoping review methodology to synthesize literature on cesarean section trends, rather than primary data collection (Mahfooz et al., 2023).

Table 1: Study Feature

Authors	Publications Year	Country	Data Sources	Methodological Approach	Settings/Study area
Adewuyi, E. O., Auta, A., Adewuyi, M. I., Phili, A. A., Olutuase, V., Zhao, Y., & Khanal, V (2024)	2024	Nigeria	Nigerian Demographic and Health Survey (NDHS) 2018	Data disaggregation approach to analyze; two-stage stratified cluster sampling method	Across rural and urban residences in Nigeria
Roh, S., Lee, H. Y., Jun, J. S., Lee, Y.-S., & Won, C. R. (2023).	2023	United States	American Indian women residing in the Northern Plains region of the United States.	A survey research design with convenience sampling.	Northern Plains region of the United States
Yang, Y., & Yu, M. (2023)	2023	China	A community-based cross-sectional household survey	A cross-sectional study; A multistage, judgment, quota sampling procedure was employed to select the participants of the survey.	Rural areas (Gansu and Yunnan Province, Western China) of China
Kabir, M. R. (2021)	2021	Bangladesh	Bangladesh Demographic Health Survey (2017–18 BDHS)	Used two-stage stratified sampling to select study households, and data were collected through face-to-face interviews	Rural and urban residences Bangladesh
Neupane, B., Rijal, S., G. C., S., & Basnet, T. B.(2020)	2020	Nepal	Nepal Demographic and Health Surveys data (DHS-7, 2016–2017)	A cross-sectional study ross-sectional study, a national level household survey	Rural and urban residences
Mbalinda, S. N., Kaye, D. K., Nyashanu, M., & Kiwanuka, N. (2020).	2020	Uganda	Clinics in three out of four regions (Eastern, Western, and Northern)	Mixed method study, health facilities were then randomly selected from each of the regions.	Antiretroviral therapy (ART) clinics
Kloos, H. (2020)	2020	Ethiopia	rural western Ethiopian communities	A community-based, cross-sectional study; Two-stage sampling using a simple random sampling	Gida Ayana Woreda (District)

Hossain, M. B., & Rahman, M. S (2019)	2019	Bangladesh		Mixed method (quantitative and qualitative). Purposive sampling	Northern Bangladesh
Makuta, C. M., & Du Toit, H. S. (2016)	2016	Malawi		A non-experimental, descriptive**;** proportionate stratified sampling and convenience sampling	Balaka district
Kazanga, I., Munthali, A. C., McVeigh, J., Mannan, H., & MacLachlan, M. (2019)	2019	Malawi	Malawi Demographic and Health Survey 2010 (MDHS)	using a stratified two-stage cluster design,	Lilongwe District (urban and rural areas)
Wang, W., Alva, S., Wang, S., & Fort, A. (2015)	2015	Uganda	The 2011 Uganda Demographic and Health Survey (UDHS)	National survey; nationally representative sample avoid recall bias and ensure reliability	Cover rural urban region
Sreeramareddy, C. T., Sathyanarayana, T. N., & Kumar, H. N. H. (2012)	2012	India	India Demographic and Health survey 2005–06	Stratified, multistage cluster sampling; Rural areas: Two-stage PPS (Probability Proportional to Size) sampling. Urban areas: Three-stage PPS sampling. Geographic units: Villages (rural) and census blocks/wards (urban). Primary Sampling Unit (PSU): Household.	Both private and public health sector in India.
(Azfredrick, 2016)	2016	Nigeria	School Survey	A cross-sectional study, Multistage sampling	secondary schools in southeast, Nigeria
Li, Y., Li, H., & Jiang, Y. (2023)	2023	Papua New Guinea	Papua New Guinea Demographic and Health Survey	Household survey	Papua New Guinea
Mahfooz, A., Reza, T. E., Uzma, Q., Thorpe, E., Abro, A., Khan, A., Hanif, K., Khateeb, S., & Emmanuel, F. (2023).	2023	Pakistan		A scoping review	Rural and urban area of Pakistan

Uses of Andersen Model:

Andersen's Behavioral Model of Health Services Utilization was applied in the studies as a guide to help understand why people seek or do not pursue medical attention. In order to identify the obstacles and facilitators that might the use of health services, researchers employed the model to categorize influencing variables into three primary areas: predisposing features, enabling resources, and perceived or appraised need. In order to quantify how these determinants manifest in actual populations, several studies particularly those that used the 1995 version of the model applied it to extensive national survey data (Adewuyi et al., 2024; Kabir, 2021; Wang et al., 2015). Several studies conducted mixed-methods research to record their personal narratives in order to document the patterns and lived experiences that underlie them (Hossain & Rahman, 2019). In certain instances, the model was customized for specific populations, such teenage females attending school (Azfredrick, 2016), rural and urban households (Yang & Yu, 2023), or HIV treatment patients (Mbalinda et al., 2020). One study applied an earlier version of Andersen's

model (1990), demonstrating that different versions of the framework continue to be used depending on the research context (Neupane et al., 2020).The model was used in one literature search analysis to explain trends in increased incidence of cesarean sections (Mahfooz et al., 2023).

The 1995 version of this model was used in the majority of included research projects, only a few studies added additional developments that highlight feedback mechanisms and contextual effects on healthcare use. Finally, the reviewed publications revealed that, rather than being a fixed framework, Andersen's Behavioral Model was applied flexibly across a variety of study contexts. Individual variables were defined differently depending on the study objectives, demographic features, and healthcare settings, but the majority of studies used the same three essential categories. This highlights both its adaptability and the importance of considering regional variables when applying it to maternal and reproductive healthcare research (see table 2).

Table 2: Study details

Author	Sample size	Gender	Age of the participants	Population description	Use of Andersen model version
(Adewuyi et al., 2024)	41,821	Women	15–49	Household survey	Andersen's behavioral model(ABM) version 1995 used as conceptual framework
Roh, S., Lee, H. Y., Jun, J. S., Lee, Y.-S., & Won, C. R. (2023).	259	Women	18-65	Community-based survey	Used as a framework
Yang, Y., & Yu, M. (2023).	996	Women	15–49	Community-based survey	Used as conceptual framework
Kabir, M. R. (2021).	5,011	Women	15–49	Household survey	Version 1995 used as conceptual framework
Neupane, B., Rijal, S., G. C., S., & Basnet, T. B. (2020)	11,473 households and 11,203	Women	15–49	Household survey	4th version 1990 used as conceptual framework
Mbalinda, S. N., Kaye, D. K., Nyashanu, M., & Kiwanuka, N. (2020).	213	Male and female	More than aged 15	Clinical Survey	Version 1995 of Health Service use as theoretical framework to guide the selection of independent variables.
Kloos, H. (2020)	454	Women	15–49	Community survey	Used as a framework
Hossain, M. B., & Rahman, M. S (2019)	1212 total population and sample is 125	Women	15–49		Version 1995 used as theoretical framework
Makuta, C. M., & Du Toit, H. S. (2016)	100	Women	Mothers who had at least one child younger than five years of age		Used for the development of the questionnaire.
Kazanga, I., Munthali, A. C., McVeigh, J., Mannan, H., & MacLachlan, M. (2019)	1126 women	Women	15–49	Household survey	Used as its conceptual basis
Wang, W., Alva, S., Wang, S., & Fort, A. (2015)	1,728	Women	15–49	Household survey	Andersen's Behavioral Model of Health Services Utilization guided the selection of covariates in the regression model.

Sreeramareddy, C. T., Sathyanarayana, T. N., & Kumar, H. N. H. (2012)	48,679	Women	15–49	Household survey	Used as its conceptual basis.
(Azfredrick, 2016)	3065	Adolescent Girls	15-18	Community survey	Andersen's Behavioral Model functions as a theoretical framework to analyze and explain
Li et al., 2023)	5248	women	15-49	Household survey	Andersen's behaviour model was adopted to analyse the factors associated with services
(Mahfooz et al., 2023)		women	15-49	Literature search	Used to understand the factors associated with the growing trends of Cesarean section

Variable's exploration in research:

Table 3 represents an overview of the main three variables explored in these reviewed studies. It also shows the number of the studies which used each variable. Among the reviewed studies, the Andersen model was operationalized by categorizing variables into predisposing, enabling, and need factors.

Predisposing factors most frequently included socio-demographic features such as age, gender, marital status, religion, educational attainment, partners education, occupation and partners occupation, family support and number of child/parity (Adewuyi et al., 2024; Roh et al., 2023; Yang & Yu, 2023; Kabir, 2021). Some studies extended this category to incorporate household decision-making autonomy, media exposure (e.g., frequency of reading newspapers, listening to radio, or watching television), and health beliefs (Hossain & Rahman, 2019; Makuta & du Toit, 2016).

Enabling factors were mainly represented through financial status and structural variables; including health insurance, access to healthcare facilities and transportation (Adewuyi et al., 2024; Kloos, 2020; Kazanga et al., 2019). (Mbalinda et al., 2020; Mahfooz et al., 2023) examined in other studies included organizational and policy-level aspects, such as permission to seek care, companionship during facility visits, or access to adolescent-friendly services.

Need factors represented both perceived and observed health requirements. Perceived needs included self-reported health concerns, fertility intentions, desire to avoid pregnancy, or satisfaction with services (Yang & Yu, 2023; Mbalinda et al., 2020). Evaluated needs were often assessed through clinical or service-use data, such as previous diagnoses, pregnancy complications, recent hospitalizations, or prior utilization of maternal and child health services (Kloos, 2020; Sreeramareddy et al., 2012). Some studies addressed both perspectives, integrating the individual's own sense of need with provider-assessed health conditions (Kazanga et al., 2019; Wang et al., 2015).

Certain studies used the same classification scheme for the variables. There were, however, variations in how certain research categorized characteristics as enabling and predisposing. (The variables are displayed in Table 3 in the original categories used in the examined studies.) According to Andersen three most recent justifications of the model, the variables were gathered together and provided to only one of the categories (predisposing, enabling, or need factors) in order to organize and present the findings of this narrative review. Changes to the initial classification have been recorded in instances where reclassification was required.

Predisposing Factors

Predisposing factors are the personal traits and circumstances that exist before any health problem arises and influence how likely someone is to seek healthcare. These can include things like age, gender, education, cultural background, social status, and personal beliefs about health.

Demographic characteristics

Age: Age consistently influences service use. Age was identified as a determinant of healthcare utilization in 14 of the 15 reviewed studies [Adewuyi et al. (2024); Roh et al. (2023); Yang & Yu (2023); Kabir (2021); Neupane et al. (2020); Mbalinda et al. (2020); Kloos (2020); Hossain & Rahman (2019); Makuta & Du Toit (2016); Wang et al. (2015); Sreeramareddy et al. (2012); Azfredrick (2016); Li et al. (2023); Kazanga et al. (2019)].

Gender: A large number of included reviews only focused on women but a few (Mbalinda et al., 2020; Makuta & du Toit, 2016) included men, highlighting that gender norms influence healthcare decision-making.

Marital status: Marital status affects social support networks and autonomy, especially for women, and the decision-making process in households around health care. Significant association was found in 8 studies (Yang & Yu, 2023; Kabir, 2021; Wang et al., 2015; Kloos, 2020; Hossain & Rahman, 2019; Makuta & Du Toit, 2016; Neupane et al., 2020; Mbalinda et al., 2020). Having a partner is associated with greater access to care due to emotional and financial support from a partner (Roh et al., 2023; Wang et al., 2015). In contrast, women who are unmarried may face stigma when seeking reproductive healthcare and married women sometimes maltreated by their in-laws for seeking healthcare.

Place of residence: Urban dwellers have better access to services due to proximity and facility availability, while women who live in rural areas face structural barriers (Yang & Yu, 2023 Kazanga et al., 2019) which is associated with 5 reviewed studies.

Social structure

Education: Higher education can improve awareness, health literacy, and autonomy in decision-making, thereby increasing healthcare utilization among women and their partners (Adewuyi et al., 2024; Kloos, 2020).

Occupation: Employment may increase financial capacity to afford care but can also cause time constraints that delay service use (Kabir, 2021; Makuta & du Toit, 2016). Occupation was used as predisposing factor in 6 reviewed studies [Kabir (2021); Makuta & Du Toit (2016); Adewuyi et al. (2024); Neupane et al. (2020); Kloos (2020); Wang et al. (2015)]. Health uses also depend on both women, their husband occupation (Adewuyi et al., 2024); Kabir, m. r. (2021)].

Religion and cultural norms: Cultural beliefs and religious values can either promote or discourage the use of reproductive services (Hossain & Rahman, 2019; Mahfooz et al., 2023). Religion was included as a predisposing factor in seven reviewed studies to examine healthcare utilization [Adewuyi et al. (2024); Kloos (2020); Hossain & Rahman (2019); Makuta & Du Toit (2016); Neupane et al. (2020); Yang & Yu (2023); Kabir (2021)].

Number of children: Factors such as birth order, birth interval, and number of children influence healthcare-seeking patterns (Adewuyi et al., 2024; Wang et al., 2015). Number of children related with 4 studies [Yang & Yu (2023); Kloos (2020); Wang et al. (2015); Li et al. (2023)] and birth order, birth interval and birth type found in 2 studies [Adewuyi et al., 2024; Kabir, m. r. (2021)].

Health beliefs

Perceived benefits of care: Positive attitudes toward C-section, family planning, or preventive screening increase service use (Mahfooz et al., 2023; Makuta & du Toit, 2016).

Health literacy and media exposure: Regular exposure to health information through media enhances awareness and use of services (Adewuyi et al., 2024; Roh et al., 2023).

Enabling Factors

Enabling factors are the resources that make it possible (or not) to obtain healthcare. These include economic means, physical access, social support, and health system resources.

Economic resources

Wealth index/household income: Wealth index/household income was associated with 13 studies as enabling factors [Adewuyi et al. (2024); Kabir (2021); Wang et al. (2015); Kazanga et al. (2019); Li et al. (2023); Kloos (2020); Neupane et al. (2020); Roh et al. (2023); Yang & Yu (2023); Mbalinda et al. (2020); Hossain & Rahman (2019); Makuta & Du Toit (2016); Azfredrick (2016)]. Higher economic status allows households to afford healthcare and transportation (Kabir, 2021; Kazanga et al., 2019).

Health insurance: Health insurance was also worked as enabling factor in 8 of the reviewed studies [Kabir (2021); Wang et al. (2015); Kloos (2020); Adewuyi et al. (2024); Yang & Yu (2023); Kazanga et al. (2019); Hossain & Rahman (2019); Makuta & Du Toit (2016)]. Insurance blinker reduces out-of-pocket expenses and increases service uptake (Adewuyi et al., 2024; Wang et al., 2015).

Physical access

Distance to facility: Long travel times discourage service use, especially in rural areas (Yang & Yu, 2023; Mbalinda et al., 2020). Distance to healthcare facilities was examined in 10 of the 15 reviewed studies [Kloos (2020); Kabir (2021); Mbalinda et al. (2020); Yang & Yu (2023); Adewuyi et al. (2024); Roh et al. (2023); Kazanga et al. (2019); Li et al. (2023); Wang et al. (2015); Hossain & Rahman (2019)].

Service Availability: Adolescent-friendly spaces and specialized reproductive health services encourage utilization (Mbalinda et al., 2020).

Social support: Social support was associated with 6 studies for seeking healthcare [Mbalinda et al. (2020); Adewuyi et al. (2024); Azfredrick (2016); Hossain & Rahman (2019); Kabir (2021); Neupane et al. (2020).

Decision-making autonomy and Companionship: Women's ability to decide independently to seek care is a major enabler (Adewuyi et al., 2024; Neupane et al., 2020)]. Having a companion during facility visits boosts confidence and access (Adewuyi et al., 2024).

Health system resources

Facility readiness: The presence of trained staff, medical supplies, and functioning referral systems enables service use (Hossain & Rahman, 2019).

Access to media/Mass media campaigns: Media is related with 4 reviewed studies for health uses [Adewuyi et al. (2024); Roh et al. (2023); Neupane et al. (2020); Li et al. (2023)]. Public health messaging improves awareness and motivation to seek care (Roh et al., 2023; Li et al., 2023).

Need Factors

Need factors are the most immediate causes of healthcare utilization, reflecting either perceived need or evaluated medical need.

Perceived need

It is related with 14 studies Adewuyi et al. (2024); Kabir (2021); Yang & Yu (2023); Kazanga et al. (2019); Mahfooz et al. (2023); Kloos (2020); Wang et al. (2015); Mbalinda et al. (2020); Roh et al. (2023); Hossain & Rahman (2019); Makuta & Du Toit (2016); Li et al. (2023); Azfredrick (2016); Neupane et al. (2020)] which drives initial healthcare seeking based on personal or family recognition of illness and influenced by knowledge, beliefs, and symptom awareness.

Reproductive intentions: A desire to become pregnant, avoid pregnancy, or space births strongly influences health service use (Adewuyi et al., 2024; Mbalinda et al., 2020).

Self-rated health status: Women's own assessment of their health can determine whether they seek care (Yang & Yu, 2023).

Evaluated need

It assessed health status guiding referrals and treatment which may reveal health needs unknown to patient, reducing gaps in care and related with the 9 reviewed studies [Kazanga et al. (2019); Wang et al. (2015); Hossain & Rahman (2019); Kloos (2020); Kabir (2021); Neupane et al. (2020); Mbalinda et al. (2020); Makuta & Du Toit (2016); Mahfooz et al. (2023)].

Medical diagnosis: Clinical conditions such as pregnancy complications or chronic diseases prompt service use (Kloos, 2020).

Child health needs: The presence of child illnesses like diarrhea or pneumonia drives immediate care-seeking (Sreeramareddy et al., 2012).

Provider recommendations: Advice given during ANC or screening visits often shapes follow-up care (Kazanga et al., 2019).

Table 3. Variable exploration

Variables			
Author	**Predisposing**	**Enabling**	**Need**
(Adewuyi et al., 2024)	**Socio-demographic** -household wealth -Maternal Age -Maternal Education -Maternal Occupation -Husband/partner's education - Husband/partner's Occupation -Maternal Religions -Maternal final say on her own healthcare -Birth order -Birth Interval -Birth Type **Health Knowledge** -Frequency of reading news Paper -Frequency of listening to radio -Frequency of Watching tv	-Access to Health insurance -Distance to health facility -Permission to visit health facility -Getting money to pay -Companionship to health facility	Desire for pregnancy
Roh, s., lee, h. Y., jun, j. S., lee, y.-s., & won, c. R. (2023).	-age -marital status -religion	-monthly household income - education level - tv/radio as health literacy source - health benefits regarding cancer screening - knowledge of hpv	-personal cancer experience -family cancer history -hospitalization in past year
Yang, y., & yu, m. (2023).	-place of residence -age -education level	-per capita household income	-perceived health needs

	-number of children	-distance to health facility -health education during anc visits -cct participation	-health service satisfaction
Kabir, m. r. (2021).	- age -marital status - working status - level of education - religion - husband's level of education -husband's occupation -birth order -women's autonomy -residence	-health insurance -wealth index	-visited a community clinic within the past 6 months -attended a temporary clinic within the past 3 months -received a visit from a family welfare officer within the past 6 months
Neupane, b., rijal, s., g. C., s., & basnet, t. b. (2020)	-age -religion -level of education -ethnicity -marital status -working status	-wealth index -provincial GDP -partners education -sex of household head -health decision maker -multimedia expose	-fertility
Mbalinda, s. N., kaye, d. K., nyashanu, m., & kiwanuka, n. (2020).	-age -gender -religion -education status -region -distance to clinic - parenthood status (living status) - married - age at first sex (years) - age when got married (years)	-having money to travel to the facility -access to adolescent-friendly services -support from caregivers or partners -distance to health facility	-felt need to avoid pregnancy -desire for contraception -health status related to HIV -sexual activity (evaluated need)
Kloos, h. (2020)	-age of the woman -marital status -education level of the woman -education level of the husband -religion -number of children -family decision taker	-wealth index (household economic status) -husband's employment -women employment -distance to the nearest health facility -husband's -availability of community-based health insurance -type of facility closest to the respondent	-pregnancy complications -knowledge of danger signs during pregnancy -previous use of maternal health services
Hossain, m. b., & rahman, m. s (2019)	**Demographic factors:** -age - sex -marital status. **Social structure:** -education -occupation -family size -religion. **Health belief:** -attitude -values -knowledge about health services	**Community resources:** -available health services -health organization -health policy, social network	**Perceived need:** -respondents -husband - household head and other members. **Evaluated need:** -health worker and service providers
Makuta, c. M., & du toit, h. S. (2016)	**Demographic factors:** - age -gender -marital status	-income -place of residence	-perceived need -evaluated need

	Social structure: - educational level -occupation -religion -social roles -cultural aspects **Health beliefs** -personal attitudes towards health -attitudes towards health personnel	-community resources use of health services	
Kazanga, i., munthali, a. C., mcveigh, j., mannan, h., & maclachlan, m. (2019)	-Age -education level -place of residence	-wealth status (economic ability), -access to healthcare	**Perceived need:** woman's own sense of health risks or problems. **Evaluated need**: clinically identified health issues by providers.
Wang, w., alva, s., wang, s., & fort, a. (2015)	-age -education level attainment -region of residence -type of place of residence -religion -marital status -number of children ever born.	-wealth indicator -health insurance	-visiting the health facility in the year prior to the survey
Sreeramareddy, c. T., sathyanarayana, t. N., & kumar, h. N. H. (2012)	-age -religion -educational attainment of the mother -age and sex of the child -previous use of health services (i.e. place of childbirth which was classified as home, private sector and public sector)	-wealth index -health scheme or insurance by any family member	-diarrhea -fever -cough -blood in stools (indicates severity) -rapid breathing -chest problems -blocked/runny nose.
(Azfredrick, 2016)	Age	-Parental support -Parental communication -Type of reproductive health facility	-Emotional condition
(Li et al., 2023)	-Age -Education -Employment/working status	-media exposure -distance to health facility -household wealth -region -residence	-Parity
(Mahfooz et al., 2023)	-Age -Residence - Education level -Religion and social norms -Health belief and c-section	- Wealth status -organizational factors	-perceived factors -provider factors

Table 4: Andersen's Behavioral Model Variables in 15 Studies (2012-2024)

Variable Category	**Variable**	**Detailed Explanation (b-notes)**	**Studies Using the Variable (Author, Year)**	**No. of Studies (out of 15)**
Predisposing	Age	a. Universal predictor reflecting life stage and physiological changes. b. Influences health needs and	Adewuyi et al. (2024); Roh et al. (2023); Yang & Yu (2023); Kabir (2021); Neupane et al. (2020); Mbalinda et al.	15

		behaviors across lifespan.	(2020); Kloos (2020); Hossain & Rahman (2019); Makuta & Du Toit (2016); Wang et al. (2015); Sreeramareddy et al. (2012); Azfredrick (2016); Li et al. (2023); Kazanga et al. (2019)	
	Education Level (Self)	c. Critical for health literacy and service awareness. d. Higher education improves decision-making and autonomy.	Adewuyi et al. (2024); Roh et al. (2023); Yang & Yu (2023); Kabir (2021); Neupane et al. (2020); Kloos (2020); Hossain & Rahman (2019); Makuta & Du Toit (2016); Wang et al. (2015); Sreeramareddy et al. (2012); Li et al. (2023); Kazanga et al. (2019)	12
	Marital Status	e. Affects social support networks and autonomy, especially for women. f. Influences healthcare decisions within households.	Yang & Yu (2023); Kabir (2021); Wang et al. (2015); Kloos (2020); Hossain & Rahman (2019); Makuta & Du Toit (2016); Neupane et al. (2020); Mbalinda et al. (2020)	8
	Religion	g. Shapes health beliefs and cultural acceptance of healthcare. h. Can promote or hinder healthcare utilization due to cultural norms.	Adewuyi et al. (2024); Kloos (2020); Hossain & Rahman (2019); Makuta & Du Toit (2016); Neupane et al. (2020); Yang & Yu (2023); Kabir (2021)	7
	Occupation	i. Indicates socioeconomic status and impacts healthcare affordability. j. Work schedules can limit time for accessing services.	Kabir (2021); Makuta & Du Toit (2016); Adewuyi et al. (2024); Neupane et al. (2020); Kloos (2020); Wang et al. (2015)	6
	Ethnicity / Region	k. Reflects cultural, linguistic, and geographical differences affecting access. l. Rural vs. urban disparities can create health inequities.	Neupane et al. (2020); Kazanga et al. (2019); Yang & Yu (2023); Li et al. (2023); Azfredrick (2016)	5
Enabling	Household Wealth / Index	m. Major determinant of ability to afford healthcare and related costs. n. Poverty limits access and service use.	Adewuyi et al. (2024); Kabir (2021); Wang et al. (2015); Kazanga et al. (2019); Li et al. (2023); Kloos (2020); Neupane et al. (2020); Roh	13

			et al. (2023); Yang & Yu (2023); Mbalinda et al. (2020); Hossain & Rahman (2019); Makuta & Du Toit (2016); Azfredrick (2016)	
	Health Insurance	o. Reduces out-of-pocket expenses and financial barriers. p. Increases likelihood of regular healthcare visits.	Kabir (2021); Wang et al. (2015); Kloos (2020); Adewuyi et al. (2024); Yang & Yu (2023); Kazanga et al. (2019); Hossain & Rahman (2019); Makuta & Du Toit (2016)	8
	Distance to Health Facility	q. Physical proximity affects ease of access, especially in rural settings. r. Longer distance increases travel time and cost, hindering utilization.	Kloos (2020); Kabir (2021); Mbalinda et al. (2020); Yang & Yu (2023); Adewuyi et al. (2024); Roh et al. (2023); Kazanga et al. (2019); Li et al. (2023); Wang et al. (2015); Hossain & Rahman (2019)	10
	Media Exposure (TV, Radio, Newspaper)	s. Facilitates health knowledge and awareness of services. t. Promotes preventive health behaviors and care-seeking.	Adewuyi et al. (2024); Roh et al. (2023); Hossain & Rahman (2019); Yang & Yu (2023); Kabir (2021); Neupane et al. (2020); Azfredrick (2016)	7
	Social Support / Permission	u. Social/family approval important for women/adolescents seeking care. v. Encouragement enhances ability	Mbalinda et al. (2020); Adewuyi et al. (2024); Azfredrick (2016); Hossain & Rahman (2019); Kabir (2021); Neupane et al. (2020)	6
Need	Perceived Health Need	w. Drives initial healthcare seeking based on personal or family recognition of illness. x. Influenced by knowledge, beliefs, and symptom awareness.	Adewuyi et al. (2024); Kabir (2021); Yang & Yu (2023); Kazanga et al. (2019); Mahfooz et al. (2023); Kloos (2020); Wang et al. (2015); Mbalinda et al. (2020); Roh et al. (2023); Hossain & Rahman (2019); Makuta & Du Toit (2016); Li et al. (2023); Azfredrick (2016); Neupane et al. (2020)	14
	Evaluated Health Need (Clinical Diagnosis)	y. Provider-assessed health status guiding referrals and treatment. z. May reveal	Kazanga et al. (2019); Wang et al. (2015); Hossain & Rahman (2019); Kloos (2020); Kabir (2021);	9

		health needs unknown to patient, reducing gaps in care.	Neupane et al. (2020); Mbalinda et al. (2020); Makuta & Du Toit (2016); Mahfooz et al. (2023)	
	Previous Health Service Use	aa. Habitual use shows trust and familiarity with health system. ab. Positive past experiences encourage continued care; negative experiences deter.	Sreeramareddy et al. (2012); Kabir (2021); Mbalinda et al. (2020); Wang et al. (2015); Neupane et al. (2020); Kloos (2020); Roh et al. (2023)	7

Discussion

This narrative review examined how Andersen's Behavioral Model of Health Services Use has been havioral Model of Health Services Use has been applied in reproductive and maternal healthcare article published between 2012 and 2024. Across the 15 reviewed studies, the model was consistently used to examine the influence of 3 core factors (predisposing, enabling, and need) on healthcare utilization. All these studies covered diverse geographical settings, primarily low- and middle-income countries in Africa and Asia, and mainly focused on women of reproductive age. All things viewed, the results suggest that Andersen's model is still an accepted conceptual framework for clarifying differences in maternal and reproductive healthcare usage among different demographics and medical settings.

Majority of 15 studies adopted Andersen's 1995 version of the model, while only a limited number referred to earlier or later versions. Although the three core domains of the model were consistently applied, the classification of individual variables varied across studies depending on the research objectives, study populations, and healthcare contexts. The capacity for adaptation shows the adaptability of Andersen Model and also highlights the lack of a standardized approach to operationalizing its constructs in reproductive and maternal health research.

The review also finds out multiplex determinants that were consistently associated with healthcare utilization. Age was the most frequently examined predisposing factor, while household wealth and health insurance were the most common enabling factors. Perceived need was the most consistently reported need-related factors. These findings also stated that healthcare utilization is influenced not only by individual characteristics but also by financial resources, accessibility of services, and people's perception of health need. Andersen's model of health use is the result of multiple interrelated variables rather than a single factor and this interrelationship based on the interaction process of all factors.

The main findings further indicate that healthcare use service is embodied by the interaction of social, economic, and structural factors. Educational attainment, marital status, household wealth, health insurance, distance to health facilities, and women's decision-making autonomy were repeatedly identified as one of the core determinants across the reviewed studies.

Direct comparison is impossible for the differences in the operationalization of Andersen's model across studies. This lack of consistency points the need for more standardized application of the model in future reproductive and maternal health research, while still allowing flexibility to accommodate different healthcare contexts. These espials have significant implications for reproductive and maternal healthcare programmes, particularly in resource-constrained settings.

These findings are highly linked with low- and middle-income countries, where financial barriers, limited accessibility, and sociocultural norms continue to influence maternal and reproductive

healthcare utilization. Therefore, interventions goaled at improving service utilization should utterance both health system barriers and broader social determinants of health contexts.

This narrative review has multiple strengths. It synthesizes evidence from studies conducted across different geographical settings and demonstrates the broad applicability of Andersen's Behavioral Model in reproductive and maternal healthcare studies. However, several limitations should be acknowledged. Most of the included studies employed cross-sectional designs, limiting causal inference, and many relied on self-reported data, which may be subject to recall or reporting bias. A more comprehensive knowledge of household healthcare decision-making is also restricted by the fact that only a small number of research used the updated versions of Andersen's model, and the majority of them only focused on women.

The revised versions of Andersen's Behavioral Model should be used in future research to account for new factors that affect healthcare usage, such as situational impacts, expanding healthcare systems, and standard e-health technology. To better understand snappy links and developing healthcare-seeking behaviors across time, more longitudinal and mixed-methods research is highly needed. To provide a more thorough knowledge of reproductive and maternal healthcare utilization, Future research must include male participants and household-level decision-making processes to provide a more thorough knowledge of reproductive and maternal healthcare utilization.

Conclusion

This narrative review indicates that Andersen's Behavioral Model remains a valuable and broadly applicable framework for understanding reproductive and maternal healthcare utilization across diverse settings and contexts. All the reviewed articles indicates that healthcare utilization is influenced by the combined effects of predisposing, enabling, and need factors. The importance of individual determinants varies according to population characteristics and healthcare contexts. This reviewed result also highlights variations in the operationalization of Andersen's model across studies, emphasizing the need for greater methodological consistency while maintaining flexibility to accommodate different settings. All things considered, the results recommend regular application of Andersen's Behavioral Model to guide future studies, health requirements, and initiatives meant to enhance fair access to maternal and reproductive healthcare, especially in low- and middle-income nations.

Limitations

This narrative review has multiple limitations. First, only studies published between 2012 and 2024 were included; therefore, relevant evidence published outside this period may have been omitted. Second, the included studies differed in their study design, population characteristics, healthcare settings, and measurement of variables, limiting direct comparison across studies. Third, only published peer-reviewed articles were included, which may have introduced publication bias by excluding grey literature and unpublished studies. Finally, although Andersen's Behavioral Model provides a comprehensive framework for explaining healthcare utilization, it may not fully capture all contextual, cultural, and health system factors influencing reproductive and maternal healthcare use across different settings.

Recommendations

For a more widespread understanding of reproductive maternal health service utilization, future research should apply the updated versions of Andersen's Behavioral Model to incorporate emerging determinants of healthcare utilization, including digital health technologies, health system changes, and broader contextual influences. More longitudinal, mixed-methods, and comparative studies are needed to better understand causal relationships and changes in healthcare-seeking behaviour over time. Future studies should also include men and household-level decision-

making processes to provide a more comprehensive understanding of reproductive and maternal healthcare utilization. From a policy perspective, efforts should focus on improving women's education, financial protection, accessibility of healthcare services, and decision-making autonomy while addressing social and cultural barriers that continue to limit equitable access to reproductive and maternal healthcare.

It has a deep connection with the United Nations Sustainable Development Goals (SDGs), that assuring healthy lives and promoting well-being. It focusses on the necessary of strengthening maternal healthcare seeking behavior of mothers and also increasing awareness and encourage to achieve global health coverage.

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