



# Application and Use of Andersen's Behavioral Model as Theoretical Framework: A Systematic Literature Review from 2012–2021

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## Abstract

**Background:** Anderson's model provides a theoretical structure to understand use of health service. This scoping review aimed to examine the application of Andersen's behavioral model in different studies.

**Methods:** Related studies that were published between 2012 and 2021 were retrieved by searching PubMed, Science Direct, and CINAHL databases. Fourteen studies satisfied the criteria for inclusion.

**Results:** The reviewed studies specified that the Andersen's Model has been used in numerous parts of the health system and concerning different illnesses. The reviewed studies revealed differences in the factors examined. Most of the studies examined age, education, gender, marital status, and employment status as predisposing factors, and income, medical insurance, and living location as enabling factors. While, the chronic illnesses and perceived general health status were examined as need factors, in addition to an extensive diversity of health conditions and illnesses. Though the associations were established among the key factors tested in the reviewed studies and health care service use, the findings were inconsistent. In the reviewed studies, the setting and the study population characteristics looked to have a strong influence on the direction and strength of these associations.

**Conclusion:** Merely a slight number of common factors were examined and there were enormous differences in the methods by which these factors were classified. Future and primary studies are necessary to deepen our understanding of the use of health care services and the complexity of the Andersen's behavioral model.

**Keywords:** Andersen's behavioral model; Health services utilization

## Introduction

Anderson's behavioral model was developed by Ronald Andersen in 1968 (1,2), and was revised

in 1973, 1995, 2000, and 2001. Anderson's background as a medical sociologist and health care



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services researcher led him to start to examine the concepts of "access" and "accessibility," and his important work explored "systems" and "behavior" of medical care and identified and defined concepts of "access" in 1970 (2). Additionally, Andersen and Aday tested concepts of access (3). Operationalized and conceptualized "access" to medical health care and provided a cohesive theoretical basis to study medical health care access. Later, Andersen restructured this framework of access into a behavioral model of health services use (4).

Anderson's behavioral model for health services utilization provides a theoretical structure to understand access to and utilization of health service, and to recognize the factors that impact a person's decision to use or not use existing health services (4). This behavioral model predicts that a sequence of predisposing, enabling, and need factors influence person's utilization of health service (4). As stated by the model, predisposing factors are social and demographic structures. Enabling factors assist people to use services (e.g., resource availability). For instance, income, access to free services, and the availability of those services. Factors such as need motivate people to use the service. For example, disease conditions, illness, or physical conditions.

Andersen puts his efforts into building a model that determines conditions that assist or impede health care service utilization by people (2). This model is flexible and offers a strong analytical structure for discussion, and the variables are testable and applicable in diverse locations. It is the most regularly used tool to identify factors associated with health services utilization (4). It has been used in studies to investigate health services utilization, health conditions, and health system. Lastly, this model is a multilevel model including personal and circumstantial contributing factors of health services utilization that is extensively accepted and applied in developed nations (5). Besides, it is a well-known theoretical framework to describe and predict health services utilization (6), and it innovatively connects different factors together and offers scientists a holistic

understanding of health services utilization by patients (7). Such a model has been extensively useful in a variety of fields, including dental health service (8), mental health service (7), and emergency health service (9). However, a current overview of the application of Andersen's behavioral model is lacking, principally on the topic of its application in quantitative studies.

Therefore, we aimed to examine the application of Andersen's behavioral model in different studies.

## **Methods**

### *Search Strategy*

In the current scoping review, the electronic search was accomplished in the PubMed, Science Direct, and CINAHL databases with the keywords "Andersen's Behavioral Model" "Theoretical Structure" and "Health Services Utilization." The searching method was restricted to subsequent inclusion criteria: a) the studies were a peer-reviewed paper; b) studies that applied the Andersen's behavioral model, or the three principal factors of the model; c) full-text research article; and d) the study was published in English within the period 2012–2021. Conversely, studies published in other languages and that were not mainly addressed the utilization of health service and access to health services were excluded.

### *Study selection and search outcome*

Searching the electronic databases revealed 320 references; 200 references were excluded as they were not published in a peer-reviewed journal or were not research-based studies. Then 60 studies were excluded because, when evaluating the abstracts, it was clear that these studies obviously did not meet the inclusion criteria. Forty other studies were excluded as the study's full text was not accessible or the study could not be basically translated into English. The remaining 14 full-text references were reviewed in more detail. These studies met the inclusion criteria as defined (Fig. 1).

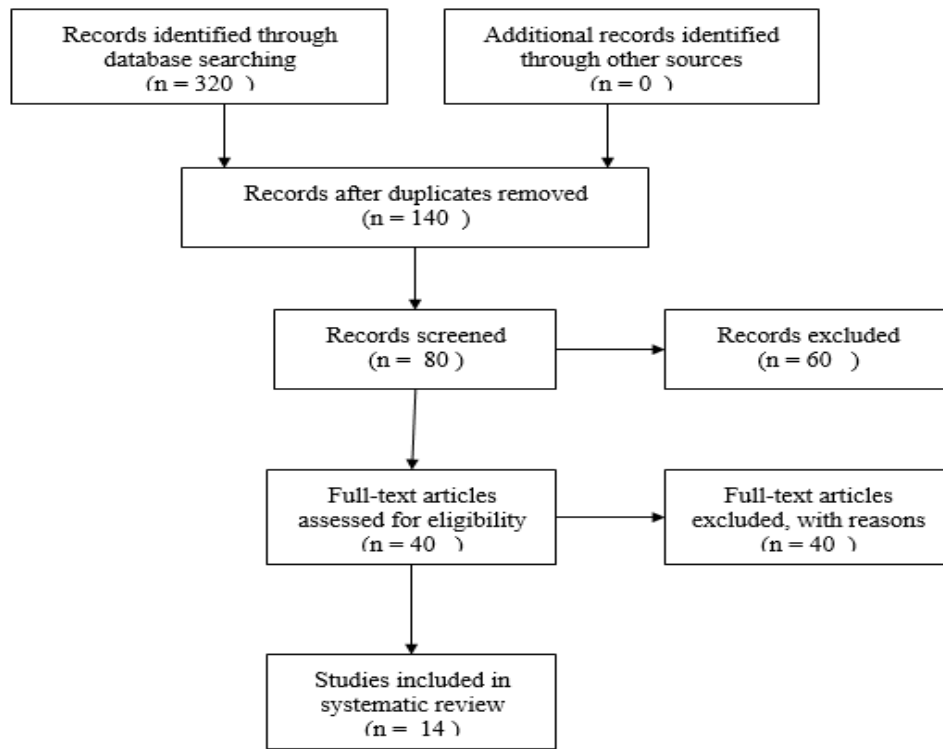


Fig. 1: Illustrates the study selection process consistent with the PRISMA statement

## Results

### *The Purposes of the Reviewed Studies*

There were extensive differences in the reviewed studies' purposes. In general, the purposes of the reviewed studies can be classified into two main groups. The first group was the studies that applied the Andersen's behavioral model among different populations, whereas the second group was the studies that applied the three basic factors of the model. The first group involved 6 studies which tested the effect of Andersen's model concepts on utilization of non-emergent emergency department (ED) (10), studied the factors that associated with health services utilization by applying the Andersen's model (11), identified the main factors that may influence antenatal care utilization through application of Andersen's model in reproductive-aged women in Eastern Ethiopia (12), discovered the motives for non-urgent ED presentations and recognized personal characteristics that impact patients' ED

utilization patterns in China (9), determined factors related to adolescent mother's utilization of post-natal care in a northern of Malawi (13), and explored the phenomenon of equity in utilization of out-patient and in-patient health services in Turkey (14). Totally, these studies added to understanding the application of Andersen's model among different populations and settings.

The second group involved eight studies that examined acute mental health services utilization beyond ED use in a public mental health users sample (15), defined the unmet needs incidence among a prospective cohort of primary breast cancer women, and explored baseline predisposing (education and age), enabling (having a partner and social support), and need factors (physical functioning, anxiety, high- or low-risk breast cancer and prior unmet needs) linked to unmet needs (16), examined patterns of primary health care utilization and factors associated with it among elderly Jordanians living in north Jordan (17), examined contributing factors of utilization

of maternal health services in Uganda (18), evaluated factors associated with university health center utilization among university students in north Jordan (19), these studies assessed associations among several variables of the Andersen's model and utilization of different health care services. Examining associations among Andersen's model variables and utilization of health services will improve the predictive capability of this model in understanding access to and predicting the factors that affect a person's decision to use or not use health services.

### *A Sample of Populations*

Different populations and samples were included in the reviewed studies. In general, the populations and samples in these studies might be classified into four groups. The first group is the reviewed studies that selected students with various education levels: 3060 adolescent girls from government secondary schools in 3 states in the southeast of Nigeria (20), and 440 students getting education from one private university (19). The second group is the reviewed studies that assessed populations and samples of chronic illnesses. The samples were 261 women with primary breast cancer, listed for surgical treatment (16), and 3,901 patients with only chronic illness and 1,829 patients with several chronic illnesses aged 19 yr or more (21).

The third group is the reviewed studies that involved women of reproductive age. The samples were 1728 women aged between 15 and 49 yr (18), 1294 women who delivered in the three years preceding the study (12), and 577 adolescent mothers who delivered two years earlier than the study (13). The last group is the reviewed studies that included patients who utilized different health care services. The samples were 10,128 participants used the public mental health services in past 4 years (15), 190 older adults who used primary health care services (19), 6,291,158 participants who used the emergency department within the 2014 (10), 13,734 participants who used outpatient and inpatient services at least once in the past year (11), 325 adult patients with mental disorders who used mental health care

services, aged between 18 and 70 yr (22), 545 patients who used emergency department services and were triaged as non-urgent (9), and 7886, 14400, and 9740 homes in 2010, 2012 and 2014, who used out-patient and in-patient treatment services in the previous 12 months (14). The reviewed studies included a variety of populations with different sample sizes from different settings. Using of Andersen's behavioral model among different populations and settings point to the applicability and the highly generalizable of the model.

### *Data Collection Methods*

The completed questionnaire method was used in all of the reviewed studies as a data collection method. Explicitly, a face-to-face interview with a structured questionnaire was administered in five of the reviewed studies (12,13,17,18,22). A self-reported questionnaire was used in five of the reviewed studies (9,10,16,19,20). Other reviewed studies used health surveys and household members surveyed.

### *The key variables investigated*

Table 1 provides a summary of the main variables tested in the reviewed studies, and it specifies the number of studies that used each variable. In the reviewed studies, several concepts and variables were systematically discussed. The most important of these variables are components of Andersen's model. The most frequently examined predisposing factors were age, education, gender, marital status, employment status, and smoking. The enabling factors most frequently examined were income, medical insurance, living location, and distance to the nearest medical institution. The most commonly studied need factors were chronic illnesses, perceived general health status, number of needs, and type of health problems. Mostly, the variables in the reviewed studies were classified in the same way. Nevertheless, there were differences in the manner of classifying variables as predisposing and enabling variables in some reviewed studies (Table 1 illustrates the variables as they were formerly classified in the reviewed studies).

**Table 1:** Main variables tested in the reviewed studies

<i>Variables and the reviewed studies examining them</i>	<i>Number of studies</i>
<b>Predisposing factors</b>	
Age (10,11,13,14,15,16,17,18,20,21,22)	11
Education (9,12-14,16-18,21)	8
Gender/sex (9,10,11,14,15,19,21,22)	8
Marital status (9,11,13,17-19,21)	7
Employment status (9,17,19)	3
Smoking (17,19,21)	3
Ethnicity (10,15)	2
Religion (13,18)	2
Parity (12,13)	2
Civil status (9,22)	2
Race (10); Living situation (15); Drinking (21); Region of residence (18); Type of place of residence (18); Number of children ever born (18); Faculty (19); Academic Year Level (19); Mass media availability, Telephone (mobile) ownership, Age at first marriage, Age at first pregnancy, Birth order, Previous use of ANC, Living in a model family, and Use of maternal services by best friend (12); living alone and Spoken language (22); Use of nearest medical institution (9).	1
<b>Enabling factors</b>	
Income (9,11,13,14,17,19,22)	8
Medical insurance (9,10,14,15,17,21)	6
Living location (9,10,14)	3
Wealth indicators (12,18)	2
Private-insurance status (9,11)	2
Residence (9,12)	2
Distance to the nearest medical institution (9,13)	2
Employment status (13,14)	2
Partner and Social support (16); Day of the week of visit, Time of day of visit and Non-emergent care sources (10); Education level, Economic activities and Form of medical security (11); Parental support (20); Communication with parents (20); Type of reproductive health facility (20); Decision making on household expenses, Husband's attitude towards ANC, and Friends Social support (12); Type of housing, Amount of help desired, Total help received from services, Total help received from relatives	1
Total help received from relatives and services, Adequacy of help received from services and relatives, Number of visits to community-based services, Number of mental health professionals (MHPs) consulted, and Hospitalization (22); Transportation, Transportation to our ED, and Distance to our ED (9); Immobility (21); Marital status (14).	
<b>Need factors</b>	
Chronic illnesses (9-11,14,17,19)	6
Perceived general health status (9,17,19)	3
Number of needs (9,22)	2
Type of health problems (9,14)	2
Psych diagnosis and Substance use disorder (15); Anxiety, Physical functioning and One or more unmet needs on four months (16); Cognitive impairment (17); Chronic Disease Admission (10); Mental Health Admission (10); Disability status (11); Feelings of inadequacy (20); Positive attitude about self (20); HEW home visit, Pregnancy intention, History of abortion, pregnancy complications awareness, and Perceived importance of ANC attendance (12); Total score of needs severity, Mental disorders, Number of mental disorders, Alcohol Use Disorders Identification Test (AUDIT), Drug Abuse Screening Test (DAST), Number of somatic disorders and Has any somatic disorder (22); Self-rated emergency level, Duration of illness onset, Physical activity, and Health screenings (9); Severe abdominal pains, Vaginal bleeding and Obstetric complication (13).	1

### ***Predisposing factors***

#### ***Age***

A significant association were established between age and health service utilization in the majority of studies in the present review (10,11,15-18,20-21). Still, association direction varied extensively based on other participant characteristics. For instance, it was establishing that age was positively associated with the outpatient and inpatient health services utilization in the previous 12 months (11), and older age was positively associated with the utilization of PHC services in the past 6 and 12 months (17). In Malawi, young mothers' age has a significant influence on postnatal health services utilization by young mothers aged 13–19 yr, and it impacts their access to postnatal health care services (13). In another study, younger age was found to be an important element linked to a higher possibility of being a high user of the public mental health system (15).

#### ***Education level***

In nine reviewed studies, education was associated with utilization of health service (9,12-14,16-18,21). For example, in Denmark, high education level is associated with unmet needs at 4 months (16). Use of primary health care (PHC) services was associated with education level of older adults in the previous 6 and 12 months (17). Three reviewed studies that tested education level as a predisposing variable specified that women with secondary and higher education were more expected to use the required maternal health package (18). Education level influences utilization of antenatal care and postnatal care (12,13). In one study, which measured education level as an enabling variable among Korean adults, education level was associated with health services utilization (11). Three of the reviewed studies indicated that it is a main element of health service utilization between patients with single and multiple chronic diseases (21); utilization of alternative services before ED presentation (9); and utilization of general physician visits (14).

#### ***Gender***

Gender was found to be associated with health services utilization in many of the reviewed studies (9,10,11,13-15,17,21). Four reviewed studies examining gender as a predisposing variable stated that women were more probable to use the public mental health system (15), emergency departments for non-emergent reasons (10), outpatients and inpatients with multiple chronic diseases (21), and GP and outpatient services compared with men (14). Males used more university health center services in the previous 6 months, according to another study (19). In Korea, women were more probable to use outpatient services, but men were more likely to use inpatient services (11).

#### ***Marital status***

Marital status was found to be frequently associated with health service utilization (11,13,18,21). According to a review study that looked at marital status as a risk factor, married women are less likely to use maternal health care services (18). A Korean study illustrated that marital status had significant effects on the health-services-utilization experience of outpatients and inpatients (11). Marital status influences outpatient and inpatient care use in a sample of patients with single or multiple chronic diseases aged 19 yr or more (21). Concerning maternal care services, marital status as a predisposing factor had a significant influence on post-natal care services utilization (13).

#### ***Enabling factors***

##### ***Income or financial situation***

A Korean study established that those who were economically active were less likely to use inpatient services than those who were economically inactive (11). Adolescent mothers with high family income were more likely to use postnatal health care than those with low family income (13).

##### ***Medical Insurance***

A number of studies indicated that being medically insured increases the likelihood of using

health care services in various population age groups (14,15,21). In the United States, individuals with Medicaid insurance were significantly more likely to use public mental health services (15). Patients with single chronic illnesses who had private health insurance used more inpatient health services (21). According to a Turkish study that investigated equity in the use of health care services, a person's insurance status has a statistically significant impact on the likelihood of using health care services (14).

### ***Living location***

People with an urban living location have a higher likelihood to use emergency health services (10). In Turkey, the place of residence of a person is among the statistically important factors influencing the use of health services (14).

### ***Need factors***

#### ***Chronic illnesses***

A number of studies have described significant links between chronic illnesses and the use of health care services (10,11,17,19). In a Jordanian study of older adults, those with chronic illness had significantly more primary health care services used than others (17). In the USA, having a chronic illness was associated with an increased likelihood of the emergency services being used for non-emergent causes (10). Patients with chronic illness tended to use more inpatient and outpatient health care services than those without chronic illness (11). Among university students, a study revealed that those with chronic illness were more likely to use university health center services than those without chronic illness (19).

#### ***Perception of general health status***

Perceived general health status was associated with the use of health services in some studies (9,17). People who perceived their health as poor tended to use more primary health care services (17). In addition, patients' perceived health status has a significant role in the use of emergency health care services (9).

## **Discussion**

The present review gives a current overview of the application of Andersen's model in different health care settings with different populations and different illnesses. The suitability of the model for quantitative research was revealed in the present review, as the majority of the reviewed publications used quantitative methods. Most of the reviewed studies were carried out in different countries, including the USA, Denmark, Jordan, Uganda, Korea, Nigeria, Australia, Canada, China, and Turkey, which increases the external validity of the review's results.

All of the reviewed studies are based on Andersen's Model as their theoretical background. As demonstrated by Table 1, while the reviewed studies examined an extensive range of variables, most of these studies concentrated on the same key variables. The key predisposing variables studied were age, education, gender, and marital status, and the key enabling factors were income, medical insurance, and living location. The key need variables studied were chronic illnesses and perceived general health status. This review finding was consistent with past systematic reviews of studies on Andersen's model (23).

In general, the findings of the examined studies confirmed the previous systematic review's findings about the associations of predisposing, enabling, and need factors with use of health care services (23). Regarding the need factors, this review confirmed an association, primarily between chronic conditions besides perceived general health status and use of health services. A growing demand often indicates illness symptoms that can be investigated further by consulting a doctor, as shown by numerous prior studies (23). Longitudinal studies are required to explain the relationship between the emergence of single illnesses and the use of health care services as well as the relationship between various multimorbidity patterns and the use of health care services. Mostly, the examined variables were classified in exactly the same way in the reviewed studies, with only some studies opposing their arrange-

ment of predisposing and enabling variables. These conflicting arrangements suggest that certain variables may play two roles in the use of health care services. For example, education level may be seen as both a predisposing factor for its association with a person's sociodemographic status and an enabling factor (e.g., its association with a person's income; a person with a higher education level possibly has better work opportunities and better economic status (24).

The findings of the above-mentioned analysis could assist in anticipating the trend of use of health care services. Given numerous directions in Jordan's socioeconomic development and related regulations, both urban and rural areas are likely to use more health care services because of the growing aging population. As this review finds a constant pattern of age influences, it is expected that population aging will have a positive impact on the use of health care services in the future.

From a policy perspective, the results of this review recommend that contextual enabling factors, such as the health insurance system, will increase the use of health care services. In Jordan, the implementation of an expanded health insurance plan will increase the use of health care services in the future.

Finally, this review explores publications that adopted Andersen's model without limiting the search on target group, care setting or disease. In addition, it gives understandings of the Andersen's Model in quantitative research.

## Conclusion

There is a necessity for primary studies that focus on the comprehensive application of the Andersen's Model and sufficiently operationalize the model complexity through applying complex statistical analysis. Such a study would allow researchers to look beyond specific indicator examinations and descriptions to better comprehend the connections among the primary components (predisposing, enabling, and need) and study feedback loops.

Future studies may include in the model more contextual factors (particularly predisposing and need factors (for example, demographic characteristics of a community, the physical environment, health-related measures, indices of population health) improve understanding of how community and environmental factors help shape the behavior of community inhabitants regarding the use of health services.

## Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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## Conflicts of interest

The author declares that there is no conflict of interest.

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