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Review Article

Determinants of Outpatient Health Service Utilization according to Andersen's Behavioral Model: A Systematic Scoping Review

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What's Known

- Over one billion people around the world, mostly in countries with low or average income, do not have access to healthcare services.
- Andersen's behavioral model provides a useful framework for informing the analysis of the contributing factors to health service utilization.

What's New

- Structural-level factors such as residential stability, distance to healthcare delivery centers, travel time to the nearest health center, density of health service providers and health centers, population size of municipalities, and the state-level income play an important role in health service utilization.

Abstract

Background: The present review focuses on identifying factors contributing to health service utilization (HSU) among the general adult population according to Anderson's behavioral model.

Methods: Published articles in English on factors related to HSU were identified by systematically probing the Web of Science, MEDLINE (via PubMed research engine), and Scopus databases between January 2008 and July 2018, in accordance with the PRISMA guidelines. The search terms related to HSU were combined with terms for determinants by Boolean operators AND and OR. The database search yielded 2530 papers. Furthermore, we could find 13 additional studies following a manual search we carried out on the relevant reference lists.

Results: Thirty-seven eligible studies were included in this review, and the determinants of HSU were categorized as predisposing, enabling, and need factors according to Andersen's model of HSU. The results demonstrated that all predisposing, enabling, and need factors influence HSU. In most studies, the female gender, being married, older age, and being unemployed were positively correlated with increased HSU. However, evidence was found regarding the associations between education levels, regions of residence, and HSU. Several studies reported that a higher education level was related to HSU. Higher incomes and being insured, also, significantly increased the likelihood of HSU.

Conclusion: This review has identified the importance of predisposing, enabling, and need factors, which influence outpatient HSU. The prediction of prospective demands is a major component of planning in health services since, through this measure, we make sure that the existing resources are provided in the most efficient and effective way.

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Introduction

The underutilization of health services has become an essential concern of public health and policy issues worldwide.[1] Various countries, especially in the developing world, seek to improve health service utilization (HSU) and equitable access to healthcare.[1-4] Over one billion people around the world, mostly in countries with low or average income, do not have access to healthcare services,[2, 4] which stems from a complex set of

interactive factors. In fact, decision making of individuals to use healthcare services depends on a host of interacting factors relevant to health and self-reported health situation as well as the availability of health services.[5] There have been a lot of studies probing into why HSU patterns are different from one individual to another. Concerning HSU, various theoretical models have been developed with the purpose of perceiving and exploring a multitude of factors governing it and the extent they vary based on economic, psychological, behavioral, and epidemiological veiwpoints.[6]

HSU is defined as obtaining healthcare provided by healthcare services in the form of healthcare contacts.[6] In other words, HSU refers to the point in health systems in which the needs of the patients are met on the part of health professionals. In order to explain this process, most studies have used the Behavioral Model of Health Services Utilization (BM),[7-13] which was developed in 1968 by the American medical sociologist and health services researcher, Ronald M Andersen. The BM is a multilevel model that incorporates both individual and contextual determinants of HSU.[6, 10, 12, 14, 15] Individual characteristics are evaluated at the individual level, whereas contextual characteristics such as families, communities, and national healthcare systems are measured at an aggregate level.[7, 11, 12, 14, 15] The BM provides a useful framework for informing the analysis of contributing factors to HSU,[7, 11, 16, 17] and it is built upon three components, which are presumably associated with HSU and could be applied as predictors of utilization, as follows:[14, 15]

- Predisposing factors are comprised of the sociodemographic characteristics that create the condition to increase the probability of HSU. At the individual level, these factors include age, sex, marital status, and ethnicity, along with attitudes, beliefs, values, and knowledge vis-à-vis health and health services. The contextual factors that predispose individuals to HSU encompass the demographic and social composition of communities and their collective and organizational values, as well as cultural norms.[9, 10, 12, 14, 17, 18]
- Enabling factors are considered those that can hinder or facilitate HSU. At the individual level, these factors include income, wealth, health insurance status, and regular sources of care. At the contextual level, the enabling factors consist of per capita community income; the rate of health insurance coverage; the amount, variety, location, structure, and distribution of health service facilities and personnel; provider-related factors; physician and hospital density; distance from healthcare services;[8] the availability of transportation;[4, 10] the quality of healthcare; and health policies.[1, 2, 4, 9, 12]
- Need factors are understood as variables concerning the perception of a change in individuals' health status. At the individual level, these factors encompass both the perceived need for health services and the evaluated need. At the contextual level, the need factors comprise not only environmental need features, namely occupational and traffic- and crime-based accidents and death rates but also health indices including the epidemiological indicators of mortality, morbidity, and disability.[8, 12, 19]

The evaluation of HSU patterns is useful for identifying the subgroups of patients who are either under- or overutilizing services.[12] Service underutilization has consequences for patients. By way of example, patients who are not fully engaged in care are liable to have poorer outcomes.[18]

Furthermore, understanding the factors that facilitate and inhibit HSU is essential for enhancing HSU, which explains why to ensure fair access to healthcare services, policymakers need to identify the factors that influence HSU.[4]

Previous studies have examined the role of different factors in determining HSU, including age,[4, 12, 20-22] gender,[8, 9] the education level,[8, 21] socioeconomic status,[10, 11, 13] race/ethnicity,[8, 13, 14] employment status,[1, 9, 11, 21] marital status,[4, 23, 24] income,[1, 3, 4, 12, 21, 25] and health insurance,[22, 26-30] along with cultural beliefs and perceptions.[8, 10] Moreover, other studies have focused on factors such as family size,[4, 13, 31] the cost/price of health services,[12] perceived need and self-assessed health status,[1, 14, 17] the urban/rural regions of residence,[1, 2, 9, 10, 22, 23] the characteristics of the healthcare delivery system,[8, 14] and accessibility of healthcare services.[1, 2, 8, 14]

Although some systematic reviews are available on specific populations[15, 32-34] or specific types of HSU,[18, 19, 35] to the best of our knowledge, no comprehensive review has so far been undertaken regarding the factors associated with HSU in the general adult population. Furthermore, all the numerous quantitative studies on the factors influencing HSU in recent years have addressed only one or some factors in preliminary investigations unsystematically and ambiguously. Additionally, there is a gap in the relevant literature regarding the overall association and direction of the relationship between the determinants and HSU. Accordingly, the current study is aimed to review

all studies on outpatient HSU both in order to identify factors contributing to HSU among the general population based on Andersen's BM of HSU in observational, population-based studies and in order to provide a comprehensive and up-to-date overview of these determinants.

Materials and Methods

Study Design

This systematic scoping review reviewed all available studies examined the factors of HSU in the general population. The study was approved by University of Social Welfare and Rehabilitation Sciences (IR.USWR.REC.1397.029).

Search Strategy

This review was conducted between January 2008 and July 2018 and followed the PRISMA guidelines to identify published articles on factors related to HSU. Quantitative studies were searched from the most comprehensive related databases of Web of Science, MEDLINE (PubMed), and Scopus. Similarly, additional records were identified through a manual search of the reference lists of the included studies. In addition, two key concepts, namely determinants (factors) and HSU were combined using the keywords and titles in the respective databases. The search terms related to HSU (i.e. "Health service utilization" OR "Health care utilization" OR "Health service use" OR "Health care use" OR "service utilization" OR "service use" OR "Health care utili*", OR "Health service utili*") were combined with those terms for factors (i.e. "Determinant" OR "factor", OR "predictor"). In order to have a more comprehensive search, we drew upon the entree of SCOPUS and the medical subject headings (MeSH) including the entry terms of PubMed as well.

Inclusion Criteria

Only quantitative, observational, cross-sectional, and secondary analysis studies, along with longitudinal surveys that predicted HSU by the adult population, were included in the study. Further, the outcome measure of this study was outpatient HSU such as any contact with formal HSU including private, public, and general practitioners, together with specialist physicians, for health need reasons by adults aged 15 and older. The study specifically focused on the use of services as a binary outcome (i.e. any use vs. no use). To be eligible for inclusion, the selected study must have assessed the association between HSU and any other factors (determinants). This study encompassed only original peer-reviewed research published in scientific journals in 2008 or afterwards. This cut-off point was chosen for reviewing more recent studies that were published in the last decade, with no restrictions on the geographic area of publication. Only papers published in the English language were included in the present review.

Exclusion Criteria

Studies examining the use of informal health services (e.g. friends, family, and religious support) or complementary/alternative treatments (i.e. those provided outside the formal health sector or traditional medicine) were excluded from this review. Considering that the interest population of this study was the general adult population, the studies that only focused on specific subpopulations such as children, elderly, veterans, military forces, prisoners, immigrants, and those which involved participants not living in community settings (e.g. prisoners, inpatients, and the residents of elderly care homes) or were defined by their occupation (e.g. doctors, police officers, military forces, and students) were excluded from this review. Moreover, studies of HSU in special diseases whose participants' experiences represented no wider population as well as those in which participants received specific types of HSU (e.g. maternal, mental HSU, or inpatient HSU) were not included in the current investigation. Additionally, these, reviews, letters to the editors, non-English articles, interventional or theoretical studies, irrelevant studies in terms of design and subject, studies with insufficient information or results, studies with data similar to or overlapping with those in other articles, studies with results that did not address outpatient HSU, and studies with retrospective data extracted from medical service center records were removed from the study.

Study Selection

Through the database search, we found 2530 papers. Further, we could identify another set of studies (i.e. 13) by carrying out a manual search in the relevant reference lists. After removing the duplicates, we reached 1813 articles, leading us to the title- and abstract-screening stage. The selection process was carried out in two phases. Following database search, the first (NS) and second (SEK) authors screened the identical 1813 titles/abstracts independently. Afterwards, they developed and adapted an eligibility assessment with reference to the initially specified features (refer to eligibility criteria). Later, the abstracts which remained were split into two groups and screened separately by each author. In cases of

discord on the scope of the inclusion criteria, the researchers consulted the senior author (SHMK) to reach consensus. Following this procedure, 1667 studies were excluded at this phase of data selection. Moreover, from the remaining 146 studies, NS and SHMK assessed full-text papers independently to arrive at the final set of the most eligible studies. Meanwhile, they continued their discussions to resolve possible cases of disagreement under the supervision of the senior author (ASF). On the whole, 109 studies failed to satisfy the defined eligibility criteria, and thus they were excluded from further investigation. Therefore, merely 37 studies were found to be eligible for inclusion. The full procedure for study selection was conducted in line with PRISMA guidelines (figure 1).

The findings based on Anderson's behavioral model are described below.

Quality Assessment

The quality of the selected studies was evaluated by using the Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) checklist. In other words, the quality assessment scale for cross-sectional studies was applied to assess the risk of bias in the included studies.[36, 37] Qualitative assessments were independently conducted by two reviewers (NS and SK), and in the case of disagreement, the samples were referred to a third reviewer (SHMK). For simplicity, the study was considered to be of good or satisfactory quality if it achieved a score higher than 16 on the STROBE statement. No study turned out to be poor in terms of quality. Expressed differently, eight papers were classified as fair (11≤score≤16), and the remaining 29 papers were considered good (score>16).

Data Extraction

A predefined Excel spreadsheet was applied to extract data from the included studies. The extracted data pertained to date, type, design, and the context of the study, as well as the date of publication, sample size, participants, data source, data-collection times, HSU outcomes, and factors associated with HSU.

Data Analysis

Owing to the special type of this scoping review examining the factors of HSU, a narrative synthesis was deemed the most appropriate method of data analysis.

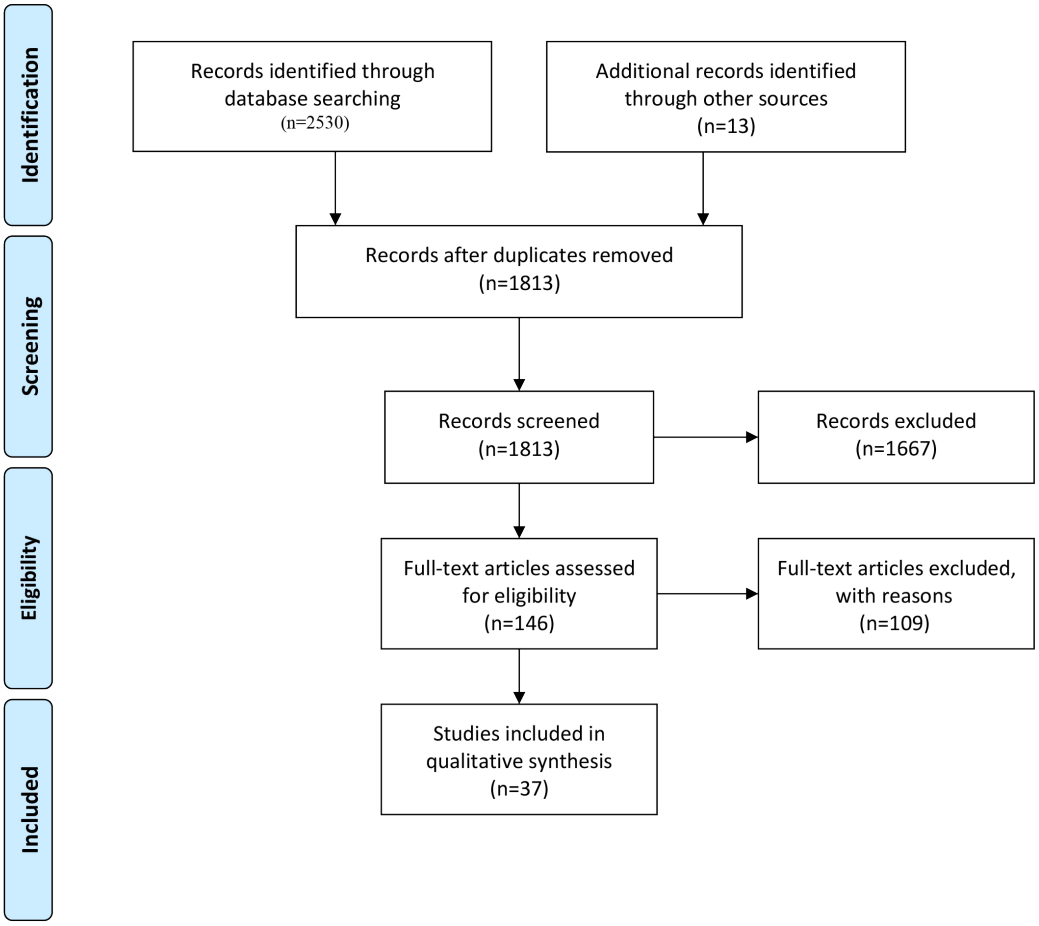

Figure 1: PRISMA flowchart shows the selection of studies.

Results

Study Characteristics

Overall, this review included 37 articles with samples from the general population. The total number of participants ranged from 200 to 327076. Most frequently, it included routine National HSU data or household survey databases.

Sixteen (43.2%), six (16.2%), two (5.4%), four (10.8%), three (8.1%), three (8.1%), and two (5.4%) studies reported data from Asia, Europe, North America, South America, Africa, and the United States of America, along with international data from across world regions, respectively. Furthermore, one (2.7%) study reported data from Australasia and another (2.7%) from Central America.

In general, the participants comprised both men and women aged 15 and over. Most studies (n=34) used retrospective data obtained from self-report measures. Furthermore, the articles included 34 cross-sectional and three longitudinal studies that recruited participants from the general population. Moreover, most studies defined HSU as a dichotomous dependent variable. Thus, 30 days or 12 months were used as HSU indices prior to data collection (the interview) whether there was a self-reported need for outpatient care services, including primary or secondary health services, and whether the respondents had contacts with (visit) healthcare professionals (e.g. general practitioners and specialists) and received medication in the preceding two weeks. A summary of the results of the included studies is presented in table 1.

Quality of Studies

The quality of the included studies was assessed using the STROBE checklist. The outcomes of the quality ratings in the assessment checklist are pre-defined as "good" (score>16), "fair" (11≤score≤16), or "poor" (score<11). After assessing all the studies (n=37) with the 22-item checklist, 8 studies[3, 40, 49, 50, 55, 60, 63, 67] achieved the fair scores (11≤score≤16), while the remaining 29 studies received a "good" rating,[1, 2, 4, 21, 27, 31, 38, 39, 41-48, 51-54, 56-59, 61, 62, 64-66] and no studies were excluded because of poor quality rating. Expressed differently, the study quality was rated as "good" (78.37%) for more than half of the studies, "fair" for 21.62% of the studies, and "poor" for no study.

The aforementioned scoring procedure was not meant to assess the quality of the studies considering their own primary aims. As a matter of fact, this rating system was intended to assess the quality of the evidence pertinent to this review. As the majority of the scores for the quality assessment were ranked as "good" and a few with "fair" quality, all 37 studies were included in the results section, and the results were extracted. The results of the quality rating of the studies can be seen in table 1.

Factors Associated with Outpatient Health Service Utilization

Anderson's behavioral model of HSU was employed as a framework to classify the findings (Table 2) of this review into predisposing, enabling, and need factors.[7, 12, 17]

Predisposing Factors

Almost all of the 37 included articles reported HSU rates by the predisposing factors such as gender,[2-4, 21, 31, 38, 39, 41, 44, 46, 47, 53, 54, 56, 57, 60-62, 64, 65, 67] age,[1-3, 38, 40, 41, 45, 47, 51, 52, 56, 57, 60, 61, 65] marital status,[3, 4, 21, 38, 41, 44, 60] residency/immigration status, and ethnicity.[1, 2, 41, 45, 63]

Age Group

Significant associations were found between age and HSU in the majority of the studies.[1-4, 38, 40, 41, 45, 47, 51, 56, 57, 60, 61, 65] Most of the studies indicated that middle-aged and older respondents were most likely to use health services. However, Kim and Lee found that older individuals were less likely to use outpatient health services.[60] Other researchers such as Sozmen and others, in addition to Morera Salas and others, reported that the probability of using outpatient health services was not different across age groups.[62, 43]

Gender

Most of the reviewed studies demonstrated associations between gender and HSU.[2-4, 21, 31, 38, 39, 41, 44, 46, 47, 53, 54, 56, 57, 60-62, 64, 65, 67] Additionally, females were frequently found with more tendency toward increased HSU.[2-4, 31, 38, 39, 46, 53, 54, 56, 57, 60-62, 64, 65, 67] In contrast, the results of four studies demonstrated that the rate of HSU was greater in men than women.[21, 41, 44, 47]

Marital Status

In most studies, marriage was positively associated with increased HSU. More precisely, the results indicated greater use of services by married individuals.[3, 4, 21, 38, 41, 44, 60]

Citizenship Status

Only two of the 37 included studies investigated the relationship between HSU and citizenship. The results unveiled that citizenship increased the probability of HSU.[2, 63]

Table 1: Summary of the results of the included studies

No.	Article	Location (Country)	Sample Size	Design/ Approach	Participants	Data Source	Factors (Determinants) of Health Service Utilization	Quality Assessment Score
1	Economou and others[38]	Belgium, Denmark, Greece, Ireland, Italy, Netherlands, Portugal, Spain, and the United Kingdom	N=327076	Cross-sectional, secondary analysis, retrospective cohort	Individuals >18 years old	Eight Waves of the European Community Household Panel (ECHP) survey	Unemployment, income level, education level, age, marital status, being a member of any kind of social club, being out of the labor force, self-assessed health status, working hours per week	21
2	González Álvarez and Barranquero[39]	Spain	N=7500	Longitudinal	Households and individuals ≥16 years old	European Community Household Panel (ECHP) from 1994 to 2001	Self-assessed health status, type of illness (e.g., chronic vs acute), need, education level, additional private health insurance, activity status (e.g., retiree or housewife), region of residence, doubled coverage versus publicly insured, sex, income	21
3	Krishnaswamy, Saroja, and others[1]	Malaysia	N=2202	Cross-sectional, secondary analysis	Malaysian citizens ≥16 years old	Malaysian Mental Health Survey (MMHS)	Health complications, having disabilities, age, presence of chronic illnesses, non-Chinese ethnicities, lacking health facilities near the home, having little family support during illnesses	20
4	Lemstra and others[40]	Saskatoon, Canada	N=3433	Cross-sectional (2000-2001-2003-2005) secondary analysis		Canadian Community Health Survey (CCHS)	Presence (prevalence) of heart disease, hypertension, diabetes, lower self-report health, higher age, low income	13
5	López-Cevallos and Chi[41]	Ecuador	28908 households and 33387 individuals	Cross-sectional, secondary analysis	ENDEMAIN 2004 surveyed households (individuals ≥12 years old)	National Demographic and Maternal and Child Health Survey, 2004	Ethnicity and race (mestizo), sex (male), age (aged 35), marital status (married), region of residence (urban), belonging to the highest household economic status and consuming quintiles (belongs to the highest assets and consumption quintile categories), education level (college), education level of the household head, health insurance, health problems during the previous 30 days, number of health problems	20
6	López-Cevallos and Chi[42]	Ecuador	10985 households and 46497 individuals	Cross-sectional, secondary analysis	ENDEMAIN 2004 surveyed households (individuals ≥12 years old)	National Demographic and Maternal and Child Health Survey, 2004	Density of public practice health personnel, density of service providers, density of health services per 10 000 inhabitants, socioeconomic status of households (assets and consumption quintiles), household wealth, density of private practice physicians, region of residence (rural), number of health problems, health insurance	21

No.	Article	Location (Country)	Sample Size	Design/ Approach	Participants	Data Source	Factors (Determinants) of Health Service Utilization	Quality Assessment Score
7	Morera Salas and Aparicio Llanos[43]	Costa Rica	N=4892	Cross-sectional, secondary analysis	Adults ≥15 years old	National Survey of Health for Costa Rica (ENSA), 2006	Education level, perceived health status, type of illness (chronic), geographical region of residence	17
8	Şenol [44]	Kayseri, Turkey	1880 household members living in 576 households	Cross-sectional	Household members	Seven Public Health Centers (PHCs) from 21 PHCs in the center of Kayseri between 2005 and 2006	Marital status (married), sex (male), social insurance coverage, sufficient monthly income, proximity (<500 meters), poor perception of health, type of disease (chronic)	18
9	Girma and others[21]	Jimma Zone, southwest Ethiopia	836 households	Cross-sectional	Household members (randomly selected one individual from each of the samples households)	January 30 to February 08, 2007, in Jimma Zone	Sex (male), marital status (married), household income (above the poverty line), socioeconomic status, presence of disabling health problems, presence of an illness episode in the previous 12 months, perceived transport costs, perceived treatment costs, distance to the nearest health center or hospital	17
10	Lahana and others[45]	Thessaly, Greece	N=1372 (1042 Greeks and 330 Albanians)	Cross-sectional	Individuals ≥18 years old	Cross-sectional study in 2006 in Thessaly	Healthcare needs, self-perceived health, education level, income, age, ethnicity	18
11	Tountas Lahana and others[46]	Greece	N=1005	Cross-sectional, secondary analysis	Adult population (individuals ≥18 years old)	Nationwide Household Survey Hellas Health I, 2006	Presence of a family doctor, social class (higher), region of residence, having private health insurance, education level, level of health needs (i.e., chronic illnesses), self-assessed, general health (low), sex (female)	18
12	Afzal Mahmood and others[47]	Australia	N=12914	Cross-sectional, secondary analysis	English-speaking persons aged between18 and 65 years	Australian Bureau of Statistics' National Health Survey, 2001	Household composition, living arrangements, age, sex (male), remoteness, socioeconomic status, body mass index, the status of heart condition, social support	18
13	Hansen and others[48]	Tromsø, Norway	N=12982	Cross-sectional, secondary analysis	Persons aged between 30 and 87 years	Third Nord-Trøndelag Health Survey (HUNT 3) of 2006–2008 (Household incomes and levels of education were appended from the national register data from Statistics Norway [SSB].)	Self-rated health, income, education level	17
14	Jahangeer[49]	Pakistan	N=1407	Cross-sectional, secondary analysis	Individuals belonging to 855 urban households	Pakistan Socioeconomic Survey (PSES)	Distance to a provider, household economic status and wealth (rich), duration of illness	12

No.	Article	Location (Country)	Sample Size	Design/ Approach	Participants	Data Source	Factors (Determinants) of Health Service Utilization	Quality Assessment Score
15	Nguyen[50]	Vietnam	N=16685	Cross-sectional, secondary analysis		Two most recent VHLSSs, conducted by the General Statistical Office of Vietnam (GSO), with technical support from the World Bank (WB) in the years 2004 and 2006	Having voluntary health insurance	11
16	Vikum and others[51]	Norway	N=44775 (24147 women and 20608 men)	Cross-sectional, secondary analysis	Women and men ≥20 years old	Third Nord-Trøndelag Health Survey (HUNT 3) of 2006–2008 (Household incomes and levels of education were appended from the national register data from Statistics Norway [SSB].)	High-income population, poor health, functional impairment and morbidity, living in the largest municipalities, age, sex, education level, the population size of the municipalities	20
17	Barraza-Lloréns and others[52]	Mexico	N=234609 (110460 NHS 2000 and +124 149 NHNS 2006)	Cross-sectional, secondary analysis	Individuals ≥18 years old	National Health Survey (NHS) 2000 and National Health and Nutrition Survey (NHNS), 2006	Income (higher-income), living standards (3 standard-of-living measures: household income, wealth, and expenditure), health insurance status, education level, health need, poor self-assessed health status	21
18	Gan-Yadam and others[4]	Ulaanbaatar, Mongolia	N=500(465)	Community-based, cross-sectional	Adults >18 years old	Urban and suburban residents of Ulaanbaatar	Household size (>5), residential stability, attention to health checkups, having periodic dental and physical examinations, participating in group support activities, poor self-assessed health status, self-assessed long-standing illnesses, satisfaction with health services, income (low), sex (female), age, marital status (married), the stability of life, non-hospitalization during the preceding 3 years, proper documentation, having health insurance, unwillingness to obtain information about food and nutrition, having no concerns about food and nutrition, self-treatment over the preceding 12 months, willingness to receive treatment abroad	19
19	Hassanzadeh and others[31]	Iran, Markazi	N=2711	Cross-sectional, secondary analysis	All individuals ≥15 years old (2131)	HCU survey (from 16 February to 1 March 2008)	Sex (female), having a higher household wealth index, having inpatient need for healthcare, education level, income level (higher level), having insurance	17
20	Mohammadbeigi and others[53]	Iran, Markazi	N=2711	Cross-sectional, secondary analysis	All individuals ≥15 years old (2131)	HCU survey (from 16 February to 1 March 2008)	Region of residence, education level, disease severity (requiring hospitalization), sex (female), household expenditure index quintile (lowest), employment (being a housewife/retiree)	18

No.	Article	Location (Country)	Sample Size	Design/ Approach	Participants	Data Source	Factors (Determinants) of Health Service Utilization	Quality Assessment Score
21	Vikum and others[54]	Nord-Trøndelag, Norway	N=97251 (1 [n=48414], 2 [n=28167], or 3 [n=20670])	Cross-sectional, secondary analysis (longitudinal)	All individuals ≥18 years old	Nord-Trøndelag Health Study (HUNT): HUNT1 (1984–86), HUNT2 (1995–97), and HUNT3 (2006–08) + Statistics Norway (SSB) (Personal incomes and education data were appended from the national register data from Statistics Norway [SSB].)	Income level (higher), education level (higher), socioeconomic status (higher), sex (female)	19
22	Ownby and others[55]	United States	N=475	Cross-sectional	Spanish- and English-speaking participants ≥18 years old		Health literacy (lower levels), number of health conditions, number of physical symptoms	12
23	Chiavegatto Filho and others[56]	São Paulo, Brazil	N=3588	Cross-sectional, secondary analysis	Residents ≥18 years old	The Brazilian version of the World Mental Health Survey (between May 2005 and May 2007), plus data from the Brazilian Institute of Geography and Statistics (IBGE) in the 2010 census	Sex (female), age (>60 years old), health insurance, education level (higher), income level (higher), having chronic illnesses, presence of mental illnesses in the preceding 12 months, living in areas (regions) with high median incomes and low violence levels	20
24	Fields and others[27]	United States	N=61039	Cross-sectional	Adults aged between 18 and 64 years	2006 to 2010 Medical Expenditure Panel Survey Household Component (MEPS HC)	Health insurance continuity, the region of residence (residents of metropolitan areas), discontinuously insurance (gaps in insurance coverage)	19
25	Nouraei Motlagh and others[57]	Tehran, Iran	118000 individuals (34700 households)	Cross-sectional, secondary analysis	Residents aged between 15 and 64 years in 22 districts of Tehran	Tehran Urban HEART Population-Based Survey, 2011	Having members with chronic illnesses, income level, income deciles (upper-income groups), having insurance (insured individuals), age (households with members aged >65 years or <5 years) increases the likelihood of HSU, sex (female), education level (Higher Education), employment (number of employees [more] in the household), household size (Larger), homeownership (living in rental houses) decreases the likelihood of HSU	21
26	Zhang and others[58]	China	N=143212	Cross-sectional, secondary analysis	Adults ≥15 years old	Fourth National Health Services Survey, 2008	Household income (high-income groups), presence of chronic illnesses, type of insurance schemes, education level (higher), health insurance coverage/scheme, the shortest distance to health facilities, time to reach the nearest medical institution, need, health status (limitations of daily activities)	21

No.	Article	Location (Country)	Sample Size	Design/ Approach	Participants	Data Source	Factors (Determinants) of Health Service Utilization	Quality Assessment Score
27	Duckett and others[59]	China	N=3680	Cross-sectional, secondary analysis (between 1 November 2012 and 17 January 2013)	Mainland Chinese citizens aged between 18 and 70 years	Research Centre for Contemporary China (RCCC)	Levels of distrust in clinics	17
28	Kim and Lee[60]	Korea	N=13734	Cross-sectional, secondary analysis	Household members	Source data of the Korea Health Panel (jointly collected by the consortium of the National Health Insurance Service and the Korea Institute for Health and Social Affairs), between the years 2010 and 2012	Sex (female), marital status (married), having chronic-illnesses as a need factor, age	15
29	Kim and Casado[61]	Chicago, Illinois, United States	N=212	Cross-sectional, secondary analysis	Adults ≥18 years old	Survey of the Korean American Community in Chicago, Illinois, metropolitan area (between February and May 2012)	Age (older adults), having health insurance, citizenship, income level (high-income earners), sex, family networks, perceived health	17
30	Sozmen and Unal[62]	Turkey	N=14655 individuals from 5668 households	Cross-sectional, secondary analysis	Adults ≥15 years old	Turkish Health Survey, 2008	Sex (female), having poor self-rated health, chronic illnesses (need factor), income level (lowest income quintile), education level, region of residence (rural), marital status	19
31	Tran and others[63]	Vietnam	N=200	Cross-sectional	Family head or any other person at home to participate in the survey		Availability of health services, number of health problems, perceived quality of health services, healthcare costs and expenditure, economic status, distance to community health centers, satisfaction with the availability of services, ethnicity (ethnic majority), the severity of health problems, distance (long-distance >2 km) to healthcare facilities, unaffordability	12
32	Abera Abaerei and others[2]	Gauteng Province, South Africa	N=27490	Cross-sectional, secondary analysis	Residents ≥18 years old	Quality of Life Survey, 2013	Sex (female), ethnicity (being white vs being African), having medical insurance, age (increasing), immigration status, employment status, quality of care in public healthcare services	21
33	Bazie and Adimassie[64]	Dessie, Ethiopia	N=420	Community-based cross-sectional (January to March 2015)	All adults >18 years old living in Dessie Town for 12 month preceding the study (the head of the household)	All adults >18 years old and a member of that household for at least 12 months prior to the data collection period	Sex (female), annual income greater than the poverty line, perception of health status (poor), perceived severity of illnesses (severe), number of acute illnesses in the preceding 12 months, having chronic health problems, community-level variables, time to arrive at the nearest modern healthcare center (access factors), perceived transportation costs, distance to healthcare delivery centers	17

No.	Article	Location (Country)	Sample Size	Design/ Approach	Participants	Data Source	Factors (Determinants) of Health Service Utilization	Quality Assessment Score
34	Fujita and others[65]	Chiba City, Japan	N=166966	Retrospective cohort	Adults aged between 40 and 47 years	Retrospective cohort study, conducted between April 2012 and March 2013 (Demographic data for each region were obtained from the 2010 Japanese census data.)	Income level (higher), age (elderly), sex (female), shorter travel time to the nearest facility, the density of healthcare facilities (higher), larger enhanced 2-step floating catchment area (E2SFCA) with slow decay, geographical access variables, travel time to the nearest health center, the density of health centers (number of health centers within 30 minutes' walking distance of one's residence), supply-to-demand ratio	17
35	Lostao and others[66]	Germany and Spain		Cross-sectional, (nationwide longitudinal survey) secondary analysis	In Germany: all adults ≥16 years old within each household In Spain: Spanish non-institutionalized adults aged between 16 and 75 years	Data from the 2006 and 2011 Socio-Economic Panel (SOEP), carried out in Germany, plus data from the 2006 and 2011 National Health Surveys, carried out in Spain	Income level (lower), education level	17
36	Mojumdar [3]	India		Cross-sectional, secondary analysis	Household members	24th (1986–1987) and 60th (2004–2005) NSS data	Age (<5 years), the gender of the household head (female), household head's education level, marital status (married), household size, economic condition of households, monthly per capita consumption expenditure, occupational category of the household head, belonging to regular-income groups, the ratio of (percentage) earning members in the household, social class of households (belonging to the Scheduled Caste), town size (smaller town size), state-level income (low-income states per capita income, net state domestic product, type of ailment (duration of the illness/ having chronic ailment), the gender of ailing individuals (female), age of ailing individuals (children and aged members), the incidence of morbidity (higher)	14
37	Ranjbar Ezzatabadi[67]	Iran, Isfahan	1037 households	Cross-sectional in 2014	Household members	Residents living in Isfahan Province	Economic status (high), level of education, insurance coverage, gender of the head of household (male), type of illness (contagious/ non-contagious), presence of self-medication patterns	12

Table 2: Key variables examined by the reviewed studies

Variables and the Studies Researching Each Variable	Number of Studies
Predisposing Factors	
Gender[2-4, 21, 31, 38, 39, 41, 44, 46, 47, 53, 54, 56, 57, 60-62, 64, 65, 67]	21
Age[1-4, 38, 40, 41, 45, 47, 51, 56, 57, 60, 61, 65]	15
Marital status[3, 4, 21, 38, 41, 44, 60]	7
Ethnicity[1, 2, 41, 45, 63]	5
Enabling Factors	
Income[1, 4, 21, 31, 38, 39, 44, 45, 48, 49, 51, 52, 54, 56-58, 61, 62, 64, 65]	20
Education level[3, 31, 38, 39, 41, 43, 45, 46, 48, 51-54, 56-58, 62, 67]	18
Health insurance[2, 4, 27, 31, 39, 44, 46, 50, 52, 56-58, 61, 67]	14
Socioeconomic status[3, 21, 41, 42, 46, 47, 49, 52-54, 57, 63, 67]	13
Region of residence[39, 41-43, 46, 53, 56, 62]	8
Distance/proximity[21, 44, 47, 49, 58, 63, 64] *	7
Employment status[3, 38, 39, 53, 64]	5
Household size[3, 4, 57]	3
Social support/social club[4, 38, 47]	3
Density[42, 63, 65] *	3
Citizenship[2, 63]	2
Satisfaction[4, 63]	2
Town size[3, 51]*	2
Perceived costs[21, 64]	2
Health literacy[55]	1
Having a usual source of care/family doctors[46]	1
Household composition and living arrangements[47]	1
Residential stability[4]*	1
Trust[59]	1
Family network[61]	1
Quality of health services[63]	1
Population size[51]*	1
State-level income[3]*	1
Need Factors	
Poor self-assessed health status[1, 4, 21, 39, 40, 43-45, 48, 51, 52, 58, 61, 62, 64]	15
Type of illness and presence of chronic illnesses[1, 3, 4, 39, 40, 43-45, 55, 57, 58, 61, 62, 64, 67]	15
Need[21, 39, 41, 45, 52, 55, 58, 61, 62, 64]	10
Number of health problems[41, 51, 55, 63, 64]	5
Having disability and limitations of daily activities[1, 21, 51, 58]	4
Duration of illness[3, 4, 49]	3
Disease severity[53, 64]	2
Presence of an illness episode[44]	1
Attention to health checkups and having periodic dental and physical examinations[4]	1
Self-treatment[4]	1

*Contextual factors: These factors are measured at some aggregate rather than individual levels and include health organization, provider-related factors, and community characteristics. Anderson's behavioral model of health service utilization divides the major components of contextual characteristics in the same way as individual characteristics have traditionally been divided. These characteristics encompass those that predispose (e.g., community age structure), enable (e.g., the supply of medical personnel and facilities), or suggest the needs for the individual's use of health services (e.g., mortality, morbidity, and disability rates).

Ethnicity

Differences in HSU between different ethnic groups were reported in five studies.[1, 2, 41, 45, 63] Ethnic majorities[63] had lower rates of HSU than ethnic minorities.[63] In addition, mestizos had higher rates of HSU than those of indigenous descent.[41] Skin color also determined HSU, and the likelihood of HSU increased among white people compared with Africans.[2]

Enabling Factors

Education

A good number of studies in this review have found that higher education levels are correlated with HSU,[38, 39, 41, 43, 45, 46, 48, 51, 53, 55, 57] although this was not found across all the studies. Three studies concluded that a lower level of education was correlated with a higher likelihood of HSU.[4, 27, 31] Otherwise stated, the outcomes of three studies revealed that individuals with a lower

education level had a higher probability of visiting a general physician (GP),[53, 54, 62] while those with high education levels probably further utilized specialist care services.[62]

Employment Status

Some studies indicated a positive association between HSU and unemployment or being out of the labor force.[2, 38, 39, 53] For example, it was reported that being a retiree or a housewife increased the likelihood of using specialist health services.[39, 53] Contrary to the results of the above-mentioned studies, the occupational category of the household head (i.e. belonging to the regular-income group) and the ratio of earning members in the household were reported to increase the utilization of outpatient health services.[3]

Income Level/Socioeconomic Status

Economic features were addressed in almost all the included studies that mainly focused on the income level, socioeconomic status, or household wealth.[4, 21, 31, 38-40, 44, 45, 48, 51, 52, 54, 56, 61-64] Based on the findings of two studies from Ethiopia, individuals with annual household incomes greater than the poverty line were more likely to use health services.[21, 64] High-income individuals used more private medical specialist services, as well as curative and hospital outpatient services, than low-income individuals.[45, 48, 51, 52]

Contrarily, two studies reported that lower-income individuals and the poor probably visited physicians more frequently (used health services), and one study revealed that the determinant for the use of specialist care was the lowest household expenditure index quintile.[4, 40]

The results of an investigation in a Turkish context disclosed a significant difference between the type of health service and the income level. Individuals belonging to the lowest income quintile were more likely to visit a GP, whereas those with high-income levels had a higher probability of specialist service utilization.[62] Dependency to the highest asset and consumption quintile categories (i.e. higher-income earners) increased the likelihood of using preventive health services.[41, 61]

Insurance Status

Most of the included studies confirmed the association between HSU and health insurance status. In other words, insurance significantly increased the likelihood of HSU, while uninsured individuals represented fewer probabilities for using health services.[2, 4, 31, 41, 44, 52, 56-58, 67] The findings revealed significant differences between public and private insurance in terms of HSU.[39, 46, 50] Moreover, service use varied by the type of health insurance.[27, 39, 46, 50, 58] More precisely, having private (supplemental insurance) and health insurance continuity[27] increased the probability of HSU. The type of insurance (scheme) and the continuity of health insurance also influenced the type of health services. For instance, individuals with gaps in health insurance had 29% more emergency room visits than those with continuous insurance.[27] Similarly, the possibility of using specialist health services was higher among individuals with doubled coverage insurance in comparison with those who were publicly insured,[39] and the likelihood of visiting a GP rose among those who had no private health insurance.[39]

Region of Residence (Urban/Rural)

Several studies identified an inconsistent association between the regions of residence and HSU. In some studies, living in rural areas significantly increased the likelihood of HSU,[42] consultations with a private doctor, referring to clinics,[46] or visiting a GP.[62] In contrast, three studies revealed that living in urban[41, 62] or metropolitan[27] areas increased the probability of using GP care.[27, 41, 62]

Trust in the Health System

Only one study explicitly indicated an association between trust and HSU. Additionally, higher amounts of distrust in clinics are positively correlated with a remarkably higher possibility of visiting hospitals even for common cold and headache symptoms.[59]

Regular Source of Care/Family Doctors

Having a usual source of care was reported only in one study, indicating that the presence of a family doctor increases the likelihood of HSU.[46]

Household/Family Size

Only three studies investigated the association between household size and HSU. The results of two of these studies indicated that smaller household size increased the likelihood of using health services.[3, 57] Nonetheless, the other study reported that individuals from families with more than five members were more likely to use health services.[4]

Other Enabling Factors

Owning a private property,[57] living in single-person households as a household composition, and living arrangements increase the probability of HSU.[47]

Health Literacy

There was only one published investigation available on the association between HSU and health literacy, indicating the greater likelihood of HSU with lower levels of health literacy.[55]

Family Network/Group Support Activities

Some of the included studies examined enabling factors such as family networks, group support activities, and social support. According to the results of three different studies and given social motivation, respondents who participated in group support activities,[4] those who belonged to the Scheduled Caste (an officially designated group of people in India),[3] and those who had a smaller family network[61] visited physicians more frequently.

Social Support

Only one Australian study reported associations between social support and HSU. This study demonstrated that individuals who received lower social support were more likely to use healthcare services.[47]

Need Factors

Need factors were most consistently associated with HSU. These factors were comprised of self-assessed health status or healthcare needs,[1, 4, 21, 39, 40, 43-45, 48, 51, 52, 58, 61, 62, 64] the duration and type of illness,[1, 3, 4, 39, 40, 43-45, 55, 57, 58, 61, 62, 64, 67] the number of health problems,[41, 55, 63, 64] disability or functional impairment,[1, 21, 51, 58] and disease severity.[53, 64]

Perceived Need and Self-assessed Health Status

Several studies reported significant associations between self-assessed general health status and HSU.[1,4,21,39,40,43-45,48,51,52,58,61,62,64] Poorer physical and mental health status was a significant predictor of increased utilization in nearly all the studies.[45] Respondents with poor self-assessed health status,[4, 44, 52, 58] and poor perception of health status[64] manifested a higher probability of utilizing health services.

Disability or Functional Impairment

Individuals who experienced any limitation of daily activities[58] and functional impairment,[51] as well as those who had a disability (gynecological problems and psychological symptoms)[1] or disabling health problems,[21] were significantly more likely to avail themselves of hospital and physician services.

Type of Illness (Chronic or Acute)/Duration

Several studies concluded that the duration of illness, self-assessed long-standing illnesses, or the presence of chronic illnesses as need factors increased the likelihood of using health services.[1, 3, 4, 39, 40, 43-45, 55, 57, 58, 61, 62, 64, 67] Otherwise speaking, those with a history of heart disease, hypertension, diabetes, or high blood cholesterol had significantly more physician visits than other individuals.[40]

Severity of Health Problems

Two studies established that the probability of outpatient HSU tended toward a rise as the measure of the severity of the illness represented an increase.[53, 64] Individuals with disease severity[53] and high (severe) perceived severity of illness[64] were reported to use healthcare services 96% more often than other individuals. However, another study reported a decrease in outpatient utilization by those with the most severe health problems.[63]

Number of Health Problems

The likelihood of using health services was higher in persons with more health conditions and more frequent physical symptoms.[55] A rise in the number of health problems was in tandem with an increase in the probability of using health services.[41, 63, 64] Contrarily, individuals who reported no health problems during the previous 30 days at the time of the survey used more preventive services.[41]

Other Need Factors

Nonsmoking individuals with frequent health checkups and periodic physical and dental examinations who were satisfied with health services and were not hospitalized during the preceding three years were more likely to use health services than their counterparts.[4] A similar pattern was observed among individuals who did self-treatment over the preceding 12 months, had proper documentation, and were willing to receive treatment abroad; they were neither worried nor willing to obtain information about food and nutrition.

Contextual Level Factors

Overall, no outstanding number of studies, except for a few cases, associated contextual level factors with HSU.

Residential Stability

There was limited published evidence available on residential stability as a contextual factor. The results of one study indicated that individuals who lived in a place for longer than four years were more likely to use health services.[4]

Distance to the Healthcare Delivery Centers

Contextual factors such as distance to the nearest healthcare delivery centers (i.e. shorter distance to health facilities) demonstrated a significant positive association with HSU.[21, 49, 58, 64] On the other hand, long distances (>2 km) to healthcare facilities (OR=3.6, 95% CI: 1.5 to 8.3) decreased the likelihood of HSU.[63]

Travel Time to the Nearest Health Center

According to some studies,[41, 47, 63] the likelihood of HSU rose with a shorter travel time to the nearest facility (<500 meters).

Density of Health Service Providers and Health Centers

A higher density of healthcare facilities (OR: 1.03, 95% CI: 1.01 to 1.04; P<0.001) was significantly associated with higher HSU.[65] Otherwise stated, the density of various sectors such as public practice health personnel, service providers, health services per 10,000 inhabitants,[42] the number of health centers within 30 minutes of walking distance of one's residence,[65] and private practice physicians was substantially correlated with higher utilization.[42, 65]

Population Size of Municipalities

There is a positive association between the population size of urban area and the likelihood of utilizing GP care and private specialist services. Regardless of small-town residents' use of outpatient care services, as reported in one study,[3] the inhabitants of the largest municipalities represented higher probabilities of visiting a GP or a private medical specialist.[51]

State-level Income and Other Contextual Factors

Only two studies reported that living in areas with high median income levels and low violence levels augmented the probability of using health services.[3, 56] Table 2 presents the main variables that were examined by the reviewed studies according to Andersen's behavioral model of HSU.

Discussion

In this review, we investigated 37 quantitative studies addressing the factors of HSU in the general population. We sought to identify the factors (determinants) of outpatient HSU. In line with several previous systematic reviews,[12, 15, 19, 32-35] we applied Anderson's behavioral model for general populations, as an organizational framework, to present and discuss the findings.[7, 8, 10, 16, 17] In accordance with Andersen's theoretical framework, predisposing, enabling, and need factors were most consistently found to be associated with HSU.[8-12, 14, 17]

The included studies scrutinized the association between HSU and predisposing (e.g. age, gender, marital status, and ethnicity), enabling (e.g. the education level, employment status, income, socioeconomic status, health insurance, access to a usual source of care, and the region of residence), and need (e.g. self-reported health status, the type of illness and the presence of chronic illnesses, the severity of the disease, and the duration and number of health problems) factors.

Based on the current review, it appears that several factors may increase the likelihood of HSU among people. For instance, females,[2-4, 31, 38, 39, 46, 53, 54, 56, 57, 60-62, 64, 65, 67] married individuals,[3, 4, 21, 38, 41, 44, 60] and those of older age[1-3, 38, 40, 41, 45, 47, 51, 61, 65] used more health services. In addition to the aforementioned factors, having insurance,[2, 4, 31, 41, 44, 52, 56-58, 67] high-income and socioeconomic status,[45, 48, 51, 52] poor perceived need,[4, 44, 52, 58] and severe health problems[53, 64] contributed significantly to the likelihood of HSU. Evidence suggested that the severity of the disease,[53, 64] the duration,[3, 4, 49] and presence of chronic illnesses,[39, 40, 43, 45, 57, 61, 67] were related to higher HSU.[18] However, the question whether individuals afflicted with more severe diseases are more probable to utilize health services still remains unanswered as the findings of the present study were mostly based on studies with retrospective cross-sectional designs. Thus, individuals using health services probably perceive their conditions to be more severe than those not using HSU.

Likewise, the findings revealed that age was markedly associated with the increased use of outpatient services. Further evidence was also provided as regards the increased utilization rates[3, 49] among those characterized by white/Hispanic ethnicity,[13, 45] private insurance,[27, 30, 50] and urban residence.

The majority of the studies scrutinized reports that being female increased the likelihood of HSU, while three studies showed that the amount of HSU was higher among men.[21, 47, 65] This is because women may be more distressed and better at self-monitoring their health than men; they are, consequently, more likely to share their health problems with physicians. With regard to education, most of the included studies confirmed that having a higher education level increased the use of health services, particularly specialist care services,[38, 41, 43, 45, 46, 48, 54, 56] whereas several other studies presented counter-evidence and suggested that a lower education level augmented the

likelihood of using GP or emergency services.[31, 53, 57, 62] The significant association between racial/ethnic background and service use should be interpreted cautiously given that the race/ethnicity of the samples was not reported routinely.

The results of our review showed that living in an urban area was associated with higher HSU.[27, 41, 62] This is probably due to the availability of more healthcare centers, more access to healthcare centers, and a shorter distance to these centers in urban areas in comparison with rural areas. Such findings are consistent with other studies such as those conducted by Dotse-Gborgbortsi and others,[68] who reported that an increase in the distance from the medical service centers was associated with a lower probability of childbirth in health facilities.

In the current review, we encountered a notable literature on some factors as indicated in Andersen's model. These factors, which comprise psychological factors (e.g. cultural norms, beliefs, and attitudes), were classified as "predisposing factors" and "health system factors" (e.g. the availability and accessibility of services).

Based on the findings from the reviewed studies, the effects of some predisposing factors such as ethnicity and some enabling factors such as social support, health literacy, and access to a usual source of care/family doctors on HSU remain unclear. Nonetheless, the initial findings may imply that social support, health literacy, and access to a usual source of care/family doctors are associated with HSU.[4, 38, 46, 47, 55] Almost, all the identified factors were more related to individual level compared to contextual level factors. In fact, Anderson's behavioral model could account for all the identified factors.

The current review has several limitations. First, the search was restricted only to three databases and, merely to studies published in the English language. Non-peer reviewed literature, articles published as abstracts, and dissertations/theses were not included in this review. In addition, the generalizability of the results is limited due to the small number of included studies for some variables (e.g. social support, family network, residential stability, health literacy, household composition, and living arrangement, access to a usual source of care, and trust in medical organizations). Furthermore, important contextual variables such as the population size of municipalities, town size, or the state-level income could not be examined due to the limited available data. In addition, it seems almost improbable to detect factors, which exert the greatest influence on HSU. As far as age, which is apparently a simple indicator of service utilization is concerned, the findings revealed incongruities in the strength and direction of this relationship. Further, it was not nearly feasible to make a comparison across the studies, and this constrained the scope of the findings of the present review.

This review identified several determinant factors regarding the use of HSU, which should be taken into account in national health policy-making and planning for future modeling and/or cost-effectiveness studies. We believe that an increased knowledge of the factors governing this process seems essential not only for the identification of the population groups less likely to utilize sufficient professional health services but also for the improvement of their access to proper health services.

Accordingly, we propose that health professionals consider the specific demands, preferences, and needs of individuals, especially those from potentially vulnerable subgroups when providing care. Finally, although it was beyond the aim of this review, there was some evidence to suggest that the factors associated with HSU might vary between GPs and specialists. Of course, this issue warrants further investigation.

Conclusion

In general, the present review identified the importance of predisposing, enabling, and need factors, which affect outpatient HSU. These factors should be considered by policy-makers when developing future model designing. Moreover, it is quite necessary to anticipate prospective demands in order to plan health services well and ascertain that the existing resources are adequately provided and allocated with the purpose of offering the most efficient and effective health services. As discussed in previous sections, most of the reviewed articles were in the form of secondary data analyses, indicating that the authors were obliged to select out of the variables addressed in the original primary studies. Therefore, future longitudinal research is proposed to expound any causal relationship between HSU and predisposing, enabling, need factors (e.g. stigma, living arrangements, attitudes, beliefs, and social support) as well as organizational or health system factors. Finally, a systematic review and meta-analysis is recommended to conclusively assess the causal effect of only one determinant such as income as an enabling factor, gender as a predisposing factor, or the number of health problems as a need factor on HSU.

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