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Determinants of healthcare use based on the Andersen model: a study protocol for a systematic review of longitudinal studies

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ABSTRACT

Introduction A previous systematic review published in 2012 focused on the use of health services based on the Andersen model. Extending this review, we will exclusively focus on systematically synthesising longitudinal studies examining the determinants of healthcare use based on the Andersen model. Therefore, our aim of this systematic review is to provide an overview of longitudinal observational studies investigating the predictors of healthcare use explicitly using this model.

Methods and analysis We will search three electronic databases (Medline, PsycINFO and CINAHL). Furthermore, reference lists will be searched manually. Longitudinal observational studies will be investigating the determinants of healthcare use (in terms of use of outpatient physician services (like general practitioner's visits or specialist visits in total) and hospitalisation). We will exclude disease-specific samples. Data extraction will focus on methods (eg, assessment of healthcare use), sample characteristics and main findings. A suitable tool will be used to assess the study quality. Study selection, data extraction and evaluation of study quality will be conducted by two reviewers. The findings will be presented by means of figures, summary tables, narrative summaries and meta-analysis (if possible).

Ethics and dissemination No primary data will be collected. Therefore, approval by an ethics committee is not required. Our findings are planned to be published in a peer-reviewed journal.

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Strengths and limitations of this study

► First systematic review focusing on longitudinal observational studies investigating the determinants of healthcare use explicitly using this model.
► We will conduct a quality assessment.
► Important steps (study selection, extracting data, assessment of study quality) will be conducted by two reviewers.
► Meta-analysis will be conducted (if data permit).

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visits and hospitalisation often differ from, for example, the use of oral health services.[1 2]

A widely used model to study the determinants of HCU is the Andersen model.[3] The Andersen model distinguishes between *predisposing characteristics* like sex or age, *enabling resources* like income or perceived access to HCU and *need factors* like self-rated health or various chronic illnesses. It has also recently been argued to extend this model to include psychosocial factors.[4–6]

Based on the Andersen model, a large body of cross-sectional studies exists examining the determinants of HCU[7 8]. A systematic review published in 2012 summarised studies investigating the determinants of HCU using the Andersen model.[1] While there was a large variety in the variables used, various included cross-sectional studies showed a positive association between need factors and HCU.[1]

In recent years, a rising number of longitudinal studies have been published[9–16] These recent longitudinal studies showed, among other things, that increasing needs are associated with increases in HCU. To date, there is a lack of studies systematically synthesising longitudinal studies investigating the determinants of HCU based on the Andersen model. Therefore, the purpose of this systematic review is to give an overview of evidence using longitudinal observational studies. This also extends the aforementioned review[1] as

INTRODUCTION

Healthcare use (HCU) is the meeting of supply and demand of healthcare. It particularly includes outpatient physician visits (eg, general practitioner (GP) and specialist visits) and hospital stays. While it is worth acknowledging that other aspects of HCU are present (eg, preventive care such as cancer screenings or check-ups; mental HCU; oral HCU), we will focus on outpatient physician visits and hospitalisation for reasons of homogeneity in the outcome measures. Moreover, the determinants of outpatient physician

we will exclusively concentrate on systematically synthesising *longitudinal* studies examining the determinants of HCU based on the Andersen model. In sum, this knowledge may assist in handling HCU.

An increased HCU is accompanied by substantial financial efforts (from a healthcare and a societal perspective).[17] Therefore, it is important to identify the factors contributing to HCU. This can help manage HCU and can assist in avoiding misuse, overuse and underuse. For example, if mainly predisposing characteristics, enabling resources and psychosocial factors are associated with HCU, this may point to a misuse, overuse or misuse. In contrast, if only need factors are longitudinally associated with increased HCU, this may indicate that individuals may use health services appropriately, that is, when medically indicated.

METHODS AND ANALYSIS

The current review methods followed the Preferred Reporting Items for Systematic Reviews and Meta-Analysis Protocols (PRISMA-P) guidelines.[18] It has been registered to the International Prospective Register of Systematic Reviews. We plan to begin our electronic search in early June 2021 and intend to submit our systematic review at the end of November 2021.

Eligibility criteria

A pretest will be conducted (100 titles/abstract will be screened) before final eligibility criteria. If required, criteria will be refined after the pretest.

Inclusion and exclusion criteria are shown in the next sections.

Inclusion criteria

Inclusion criteria for our systematic review are

► Longitudinal observational studies investigating the determinants of HCU in terms of outpatient physician services (like GP visits or specialist visits in total) and hospitalisation.
► Studies based on the Andersen model.
► Assessment of key variables with appropriate tools.
► Studies in English or German language, published in peer-reviewed, scientific journal.

Exclusion criteria

Exclusion criteria for our systematic review are

► Studies not investigating the determinants of HCU.
► Cross-sectional studies.
► Studies not based on the Andersen model.
► Studies solely investigating samples with a specific disorder (eg, individuals with mental disorders).
► Studies exclusively focusing on single medical specialties (other than GP visits) like neurologist (visits).
► Study design other than observational.
► Assessment of key variables not appropriate.

Table 1 . Search strategy (PubMed search algorithm)

#1	**Health care**
#2	Health service*
#3	#1 OR #2
#4	Use
#5	Utili*
#6	#4 OR #5
#7	#3 AND #6
#8	GP visits
#9	Hospital admission
#10	Hospitalization
#11	Specialist visits
#12	Doctor visits
#13	Physician visits
#14	General Practitioner visits
#15	#7 OR #8 OR #9 OR #10 OR #11 OR #12 OR #13 OR #14
#16	Andersen model
#17	Andersen's behavioral model of health serv*
#18	Andersen and Newman behavioral model of health serv*
#19	#16 OR #17 OR #18
#20	Longitudinal
#21	Cohort study
#22	Prospective study
#23	Panel study
#24	#20 OR #21 OR #22 OR #23
#25	#15 AND #19 AND #24

► Studies published in language other than English or German, or not published in peer-reviewed journal.

The following electronic databases will be searched: PubMed, PsycInfo and CINAHL. Predefined terms will be used in our review. The search strategy (PubMed) is shown in table 1. Restrictions will not be given with regards to time and location. Two reviewers will manually search reference lists (of the studies meeting our final inclusion criteria).

Data management

Endnote X7 (Clarivate Analytics, Philadelphia, Pennsylvania, USA) will be used for importing the data. Stata V.16.0 (StataCorp, College Station, Texas, USA) will be used to perform a meta-analysis (if possible).

Study selection process

After finishing the search, two reviewers (AH and BK) will screen the titles/abstracts for their potential inclusion against the eligibility criteria. Subsequently, the full texts will be screened by these two reviewers. In case of discrepancies, discussions will be held. If an agreement cannot be reached, a third party (H-HK) will be included.

Data collection process and data items

Two reviewers (AH, BK) will perform data extraction. One reviewer will extract the data and a second reviewer will cross-check it. If needed, a third party (H-HK) will be involved. Furthermore, if required, study authors will be contacted. Particularly, data extraction will include study design, independent variables (predisposing characteristics, enabling resources and need factors (if possible: psychosocial factors)), definition and measurement of HCU, sample characteristics, statistical analysis and key findings.

Assessment of study quality/risk of bias

A tool for HCU studies (like the tool developed by Hohls et al[19]) will be used to evaluate the quality of the studies. The study quality will be independently evaluated by two reviewers (AH and BK). If required, discussion will be held until consensus is reached. If agreement cannot be reached, a third party (H-HK) will be contacted. The study quality assessment will be included in our work.

Data synthesis

After finishing the screening process, a PRISMA flow diagram will be produced to show the study selection process. In a narrative synthesis, the key findings will be presented. It is planned to categorise the findings in accordance with the Andersen model (distinguishing between predisposing characteristics, enabling resources and need factors (if possible: psychosocial factors)). If the requirements are fulfilled, a meta-analysis will be performed. More precisely, in dependence on the heterogeneity between the studies, extracted aggregated participant data will be analysed quantitatively by two individuals (AH and BK). Depending on the fact whether there is significant heterogeneity, ORs with 95% CIs will be combined by a random effect meta-analysis or fixed-effect meta-Analysis based on an inverse variance method. The I^2 test will assist in evaluating the heterogeneity.

Patient and public involvement statement

The present review protocol did not involve individual patients or public agencies.

DISCUSSION

The objective of our upcoming systematic review is to provide an overview of longitudinal observational studies investigating the determinants of HCU explicitly using the Andersen model. The current paper presents the protocol for this systematic review. It should be emphasised that particularly cross-sectional studies examined the factors associated with HCU.[1] However, in the past few years, an increasing number of longitudinal studies have analysed the determinants of HCU based on the Andersen model[9–16] However, there is a lack of a systematic review systematically synthesising these longitudinal studies. Therefore, the purpose of our systematic review is to give an overview of longitudinal observational studies

investigating the determinants of HCU based on the Andersen model. Furthermore, we will evaluate the study quality.

Our systematic review may reveal possible gaps in research such as the infrequent use of specifically designed panel data methods (eg, fixed effects regressions) to identify the determinants of HCU. However, the use of appropriate methods is important to provide consistent estimates when dealing with longitudinal data.[20] Moreover, this knowledge may help to manage HCU. For example, our systematic review may reveal that particularly need factors are associated with HCU. This may indicate that individuals use healthcare services adequately, which means when it is medically indicated. However, if our systematic review identifies a link between enabling resources and HCU, this may enrich the discussion of inequalities in HCU.[21] Moreover, our systematic review may reveal that various studies did not clarify how they deal with missing data. This can have an impact on the results (eg, in terms of biased estimates or loss of statistical power).[22] Moreover, our review may identify that most studies did not examine the link between psychosocial factors and HCU and may, therefore, inspire future research. Furthermore, our review may reveal that the majority of studies has been conducted in Europe or North America and may, thus, guide future research in this area.

Against this backdrop, it should be acknowledged that the findings of our review are presumably largely driven by the characteristics of the health insurance systems of the studies included. For example, enabling resources (eg, access to the healthcare system) may be particularly important in mainly privately funded healthcare systems (such as the USA). Enabling resources may also be of great important in low-income countries with poor access to healthcare.[23] In contrast, in countries like Germany, which has a national social health insurance system, individuals usually have good access to GPs and specialist visits.[24] In line with this, several studies have shown that enabling resources are often not associated with HCU in Germany.[11 25] Similar findings have been found in government-financed healthcare systems (Canada).[26]

Strengths and limitations

This is the first systematic review regarding the determinants of HCU based on the Andersen model explicitly focusing on longitudinal studies. Focusing on longitudinal studies may assist to detect studies that are characterised by a high quality of methodology and, therefore, may provide more valid conclusions with regards to the determinants of HCU. In general, longitudinal data offer the possibility to reduce the problem of unobserved heterogeneity (eg, FE regressions can control for time-constant observed and unobserved factors such as genetic disposition).[20] This is a key advantage compared with cross-sectional data. Moreover, longitudinal data can assist in clarifying the directionality between different factors.[20] Further details are provided elsewhere.[20]

Two reviewers are involved in several processes like selection of the studies or evaluation of the study quality. It is worth noting that the possibility cannot be ruled out that a meta-analysis cannot be conducted because of the heterogeneity between the different studies.

ETHICS AND DISSEMINATION

No primary data will be collected. Therefore, approval by an ethics committee is not required. Our findings are planned to be published in a peer-reviewed journal.

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