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A scoping review into the explanations for differences in the degrees of shared decision making experienced by patient

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ABSTRACT

Objectives: In order to improve the degree of shared decision making (SDM) experienced by patients, it is necessary to gain insight into the explanations for the differences in these degrees.

Methods: A scoping review of the literature on the explanations for differences in the degree of SDM experienced by patients was conducted. We assessed 21,329 references. Ultimately, 308 studies were included. The explanations were divided into micro, meso, and macro levels.

Results: The explanations are mainly related to the micro level. They include explanations related to the patient and healthcare professionals, the relationship between the patient and the physician, and the involvement of the patient's relatives. On the macro level, explanations are related to restrictions within the healthcare system such as time constraints, and adequate information about treatment options. On the meso level, explanations are related to the continuity of care and the involvement of other healthcare professionals.

Conclusions: SDM is not an isolated process between the physician and patient. Explanations are connected to the

macro, meso, and micro levels.
Practice implications: This scoping review suggests that there could be more focus on explanations related to the
macro and meso levels, and on how explanations at different levels are interrelated.

1. Introduction

Over the recent decades, policymakers have been prioritizing shared decision making (SDM) [1–4]. SDM is a process in which the physician and patient consider the information available about the medical problem. This includes treatment options and their consequences, and a consideration of how these fit with the patient's preferences for health status and outcomes [5–11]. SDM is dependent upon the situation. Patients may be able to choose from several treatment options, or choose not to be treated at all [12–14].

In particular in Western healthcare policy, SDM is seen as an essential process in medical practice and, as such, is incorporated widely [15,16]. In the Netherlands, policymakers are making efforts to improve SDM [17]. Nevertheless, a Dutch study showed no change in the degree of SDM experienced by patients since 2016 [18]. Besides, recent Dutch studies show varying degrees of SDM experienced by patients (e.g. [18–21]). This suggests that not all patients experience SDM, or that they experience this to a lower degree.

Given the efforts made, it may be regrettable that there has been no change in the degree of SDM experienced by patients since 2016. It may also seem a shame that not all patients experience SDM or experience SDM to a lower degree. This seems regrettable because, in theory, SDM aligns with the ethical principle of respecting patients' autonomy [9,15, 16]. Moreover, research shows that SDM is beneficial for both patients and healthcare providers. These benefits include: increasing the patient's knowledge about the medical situation; satisfaction with treatment; a reduction of unwarranted variation in healthcare, both in overuse and underuse of care; and better healthcare alignment [9,15, 22]. However, the fact that patients experience different degrees of SDM may be explained by the dependence upon a particular situation. Insight into the explanations for these differences is needed in order to determine whether such a degree is appropriate in a given situation.

We found a systematic review, conducted in 2014, which investigated the barriers and facilitators to SDM reported by patients. This review by Joseph-Williams and colleagues (2014) focused only on explanations from the patient's perspective [23]. This is a very relevant perspective. However, we are also interested in explanations outside the field of observation for an individual patient, for example that derived from experimental research. In addition, a scoping review, conducted in 2018, which focused on organizational- and system level characteristics that influence the implementation of SDM in general, concluded that organizations that wish to support the adoption of SDM should consider the role of organizational- and system level characteristics [24]. Based on these previous conducted reviews, we expect that a broader perspective might offer additional insight into the differences in the degree of SDM experienced by patients. Besides, we expect based on, among others, the review of Scholl et al. (2018), that ordering the explanations for patients' experienced degree of SDM into the macro, meso, and micro levels will be helpful [23–25].

In general, the macro, meso, and micro levels are interrelated. The micro level typically concerns the level of individual actors within organizations, the meso level is the intermediate level of organizations, and the macro level is the level of social institutions, the market and the government [26]. In the context of this scoping review, explanations on the micro level focus on day-to-day patient care and the interaction between the patient and the physician, explanations on the meso level focus on the hospital governance and institutional decisions that take place within healthcare organizations, and explanations on the macro level focus on the governmental decisions that determine the organization and funding of the overall healthcare system and its policies [25, 27].

Moreover, the micro, meso, and macro level framing enables us to get insight into the interconnections between explanations across different levels [28].

Against this background, a recent overview of explanations for these differences seems to be lacking. Therefore, we will answer the following research question: "What are the explanations for differences in the degrees of shared decision making experienced by patients?". In order to answer the research question, we conducted a scoping review with the aim of summarizing and disseminating our research findings in order to explain these differences and to identify gaps in the literature on this subject [29].

2. Methods

The research protocol was registered on OSF.io (https://doi.org/10.17605/OSF.IO/GQ7EA) and the scoping review was guided by the methodological framework developed by Arksey and O'Malley (2005).

This framework consists of five stages: 1) identifying research questions; 2) identifying relevant studies; 3) selecting studies; 4) charting the data; and 5) collecting, summarizing, and reporting the results [29]. After identifying the research question as mentioned in the introduction, the search strategy was refined and finalized in collaboration with an experienced librarian. For the identification of relevant studies, we used broad conceptualizations of the degree of SDM experienced by patients. Therefore, the search strategy focused on Boolean connections (AND, OR) of different combinations for 'shared decision making', 'patients' experiences', and 'humans and adults'. Searches were conducted up to December 10th, 2021, in three bibliographic databases, PubMed, Embase, and CINAHL (see Tables 1–3 for the final search strategies). An update of the literature search was conducted up to May 19th 2023. The search results were imported into Rayyan and yielded n = 11,428 for Pubmed, n = 17,134 for Embase and n = 7857 for CINAHL (see Fig. 1). The studies that we identified, screened, and included were reported based on the Preferred Reporting Items for Systematic Reviews and Meta-analyses (PRISMA) guidelines [30].

2.1 Eligibility and exclusion criteria

Two authors (AZ and MB) independently screened all the titles and abstracts of the remaining studies taken from the initial search (n = 17,913). For the update, the first author (AZ) screened all the titles and abstracts of the remaining studies (n = 3416), and three authors (NB, RF and JD) screened a sample totaling 20% (n = 689). Only 4% of the sample initially yielded a conflicting decision. Disagreements regarding whether to include a study were resolved by discussion between two authors (AZ and NB). This occurred for instance, when it was not completely clear which measure was used for SDM.

[Table 1], [Table 2], [Table 3], [Figure 1]

The review was limited to the following eligibility criteria. Firstly, the patient's degree of SDM experienced, and explanations for this, which were measured empirically, both in a qualitative and quantitative manner. Besides, quantitatively measured explanations had to be statistically tested. And, secondly, people aged eighteen years and older were the subjects of the studies. An operationalized definition of SDM was necessary for the screening. SDM has been defined in several ways in the literature [10,31]. As a consequence some studies have been using the term in an unfamiliar manner [32]. In line with the description of SDM, outlined in the introduction, and derived from a previous scoping review about SDM in surgery, and a systematic review about the term SDM, the following working definition was determined as the most appropriate: "an approach where clinicians and patients share the best available evidence (both clinical information and patients' preferences for health status and outcomes) when faced with the task of making treatment

decisions, and where patients are supported in considering treatment options and achieving informed preferences" [9,10,32]. In order to reduce the risk of including studies inappropriately, studies were excluded when they did not explicitly mention how they define SDM. Studies were also excluded when the degree of SDM experienced was quantified among multiple stakeholders, for example patients and reporting their experiences. Quantitative studies were excluded when no total score was measured for SDM experienced by patients. Qualitative studies, furthermore, were excluded when more broad questions were asked about making treatment decisions or when the article was loosely framed as being about SDM. Lastly, we excluded studies of which the full texts were not available, and we excluded reviews because we may assume that our search includes any relevant included study in reviews.

2.2 Data extraction

After reading the full texts, the first author (AZ) charted the data according to the following outcome measures: details of publication information; study method; sample type; study setting; and, relevant findings, by which we mean explanations for the degree of SDM experienced by patients that were tested empirically. When screening the full texts, it became clear that most of the articles examined empirical relationships between the various independent variables and the degree of SDM experienced by patients. These did not examine the more general explanations for, or hypotheses about, these degrees of SDM. All these variables, tested empirically, and relating to the degree of SDM experienced that were found in the literature, have been included. The first author (AZ) grouped all variables in Microsoft Excel (2019) according to the following categories: patient characteristics, for example, age, gender, education level, and health literacy; health conditions, for example, disease, health status, and emotional distress; healthcare professional characteristics such as age and gender; tools, for example, decision aids and prompt lists; training for healthcare professionals; training for patients; the involvement of relatives and friends; the involvement of another healthcare professional, for example nurses, GPs, and doulas; contextual factors such as time, culture, guidelines, and costs; the SDM process, such as, choice awareness and preparation on SDM; information; the relationship between the patient and the physician, such as trust, and shared history; healthcare professionals' skills, for example in communication; the patient's preference for involvement, and other factors such as their self-management (e.g. [33]) or condition management skills (e.g. [34]); patients' beliefs or convictions (e.g. [35,36]); patients' self-efficacy (e.g. [37–40]); patient activation (e.g. [41]); missing cognitive testing data [42]; the region where a consultation took place [43,44] or the extent of team-interaction (e.g. [45])).

Subsequently, we organized the broader categories of explanations into macro, meso, and micro levels. An explanation for the degree of SDM experienced by patients, related to the macro level, is, for example, time constraints, which is mentioned within the category 'contextual factors'. An explanation for the degree of SDM experienced by patients related to the meso level is, for example, the involvement of a nurse in the SDM, which is mentioned within the category 'involvement of another healthcare professional'. Finally, explanations related to the micro level are for example, the patient's educational level, which is mentioned within the category 'patient characteristics,' or trust, mentioned within the category 'patient-physician relationship'.

3.Results

3.1. The characteristics of the studies we included

Ultimately, 308 articles were included (see Fig. 1). Table 4 provides an overview of the studies included and their characteristics. Most of these studies were conducted in the United States (n = 113) and in European countries, such as the Netherlands (n = 47), Germany (n = 33) and the United Kingdom (n = 21). The quality of the studies varied. Studies were conducted with different designs,

research methods, and ways of sampling. The majority of the studies used a questionnaire to measure the degree of SDM experienced by patients (n = 209) (see Table 4).

3.2. The main findings

The literature searches revealed various empirically tested explanations for differences in the degree of SDM experienced by patients (see Table 4). On the macro, meso, and micro levels, we found both limiting and promoting factors for the degrees experienced. Fig. 2 provides a schematic representation of the key findings. Ordering explanations into the macro, meso, and micro levels allowed us to provide a framework in order to gain insight into the explanations for differences in the degrees of SDM experienced. This enabled us to gain insight into the explanations that could be managed, and to identify gaps in the literature.

3.3. Explanations on the macro level

Studies report a few explanations for differences in the degree of SDM experienced on the macro level. These studies outline explanations related to restrictions within the healthcare system and its policy. Evidence based protocols to guide clinical decisions (e.g. [46–48]), insurance coverage, or, rather, the lack of it (e.g. [36,49–54]), and financial constraints (e.g. [46,55–58]) may limit treatment options (e.g. [46]). In addition, constraints on the time available to make an informed decision (e.g. [46–48,57–80]) and access to healthcare (e.g. [33,63,81]) are mentioned.

In addition, many studies mention explanations related to receiving adequate information about treatment options (e.g. [19–21,35,40,56, 57,59,61,64,65,67,69–71,74,76,78,82–123]). For example, information is conflicting (e.g. [35,46,64,67,69,87,88,114,124]). In short, inadequate information makes it difficult for patients to consider treatment options.

3.4. Explanations on the meso level

Studies also outline explanations for differences in the degree of SDM experienced by patients on the meso level, which is of healthcare institutions. These explanations are related to continuity of care (e.g. [48, 54,59,78,125]). Examples of factors which could allow less space for shared decisions include: standardized pathways (e.g. [47,126]), the structured nature of the consultation (e.g. [69,122]), scheduling restrictions (e.g. [46,58,67]), a lack of continuity in treating physicians (e.g. [20,55,58,59,63,127]), restricted team-interaction (e.g. [45]), and providing information too late during the process of making a treatment decision (e.g. [20]).

In addition, the involvement of another healthcare professional is mentioned (e.g. [19,54,55,58,60,88,89,110,113,128–136]). For example, case managers could prepare patients for the process of SDM (e.g. [128]), nurses could repeat and/or explain information about treatment options (e.g. [19,129–131,133]), and they could converse with patients about their preferences, values, and needs (e.g. [131,137]), and general practitioners (GPs) could offer supportive care to patients who have to make a treatment decision in secondary care after a cancer diagnosis [138,139].

3.5. Explanations on the micro level

Many studies outline explanations for differences in the degree of SDM experienced on the micro level of patient care and interactional influences. Part of the explanations relate to clinical differences between patients (e.g. [33,37,38,47,49,50,60,61,90,113,116,140–172]), and are determined by the stage, chronicity, or complexity of the illness (e.g. [37,38,57,60,122,156,163,165,172]). Some of these explanations are of interest in determining whether differences in the degree of SDM are warranted. Nevertheless, the nature of the initial diagnosis could lead to patients perceiving a lack of treatment options (e.g. [38,47,122,140]). Indeed, diagnosis or a treatment decision may entail emotional distress (e.g. [35,62,77,130]). It is important

that patients accept their diagnosis before SDM can take place (e.g. [62,129]). Furthermore, factors related to the patient and the healthcare professional, the relationship between the patient and the physician, and the involvement of relatives, could explain differences in the degrees of SDM.

[Table 4], [Figure 2]

3.5.1. Patient-related factors

Many studies mentioned patient characteristics which are related to differences in patients' experienced degree of SDM, such as: age (e.g. 35,52,57,62,63,73,113,116,149,150,152,161,162,165,170, 172–186]); gender (e.g. [52,116,142–144,154,156,170,172,175,176, 182,187]); ethnicity (e.g. [49–51,53,176,188–193]); and employment status (e.g. [52,162]). For instance, several studies show that women experience a higher degree of SDM than men (e.g. [142,144,156,175, 176,187]). In addition, these mentioned too, patients' educational level, level of health literacy (e.g. [35,36,39,49,50,57,62,75,127,143,149, 161,162,165,172,187,194–201]), and, in one study, patients' level of e-health literacy [202]. Patients who have a good understanding of their illness (e.g. [69,77,188]) and understand information about treatment options, typically experience higher degrees of SDM (e.g. [57,62,82, 203]). Accordingly, many studies have been conducted to evaluate the effectiveness of information tools (e.g. [128,204–225]), such as decision aids (e.g. [204–213,216,224–228]), in order to improve the degree of SDM experienced.

Furthermore, patient communication is mentioned (e.g. [62,69,79, 98,104,229,230]). Patients have to be able to express themselves (e.g. [62,98,117,230,231]) and to ask questions (e.g. [69,98,117]). One complicating factor for patients is speaking a language other than that of the physician (e.g. [140,232]). Personal beliefs and convictions are also specified (e.g. [35,36,63,71,74,84,98,140,233–235]). For example, patients' attitudes towards their healthcare professionals' age, gender, and ethnicity (e.g. [36,233,236]) or their preference for a paternalistic approach by the healthcare professional (e.g. [35,74,98,146,234,237]) could have an impact upon their intentions of engaging in SDM. Patients who prior to choosing a treatment, prefer SDM instead of a paternalistic approach by the healthcare professional, could experience a higher degree of SDM than those patients who did not prefer SDM (e.g. [64,67, 146,179,238–240]). In line with that, patients should be aware of, and understand the process of SDM (e.g. [46,56,62,65,80,128,241,242]), should be prepared (e.g. [38,59,61,197]), and should be aware of treatment options (e.g. [56,65,66,82,87,129]). Another explanation for differences in the degree of SDM experienced by patients is the patients' perceived health status (e.g. [51,52,75,153,156,162,176,178,243]). Several studies show that patients with higher perceived health status experience a higher degree of SDM (e.g. [51,153,162,176,243]).

3.5.2. Healthcare professional related factors

Several studies mentioned factors related to the healthcare professional which affect the degree of SDM experienced by patients (e.g. [34, 244–247]). Healthcare professionals could have an overbearing influence upon SDM (e.g. [35,55,71,72,78,84,87,92,99,117,248,249]), for example by recommending a treatment (e.g. [248,250,251]), or by not offering treatment options (e.g. [104,110,111,155]). However, the professionals are obliged to create an environment of safety and trust [61,91,201]. Therefore, the manner in which healthcare professionals communicate is important (e.g. [19,38,39,45,55,57,59,63,68,72,75,76, 79,83,91,92,95,97–99,107,110,113,118,120,124,126,236,252–257]). This could include the use of clear language, including the absence of medical jargon (e.g. [57,61,75,95,98]), showing empathy (e.g. [45,54, 76,199,236]), and listening to (e.g. [59,78,79,99,107,120,124,126,127, 254,258]), and answering,

questions (e.g. [68,80]). Accordingly, studies have been conducted to evaluate training courses which aim to increase the implementation of SDM (e.g. [222,228,259–269]).

3.5.3. The relationship between the patient and physician

Many studies address the relationship between the patient and physician. In general, patients who experience a good relationship experience a higher degree of SDM (e.g. [33,48,58,59,61,67,77,81,82, 85,86,128,236,270–274]). As an aspect of the patient-physician relationship, patients' trust in their physician is an important factor (e.g. [114,118,120,121,127,242,275–277]). Patients who trust their physician could experience a higher degree of SDM (e.g. [59,61,98,100,126, 140,188,233,271,278,279]), because they feel confident to ask questions and to consider different treatment options (e.g. [61,100,233, 279]). However, patients who trust their physician tend to have confidence in their physician and so leave the treatment decision to their physician (e.g. [47,56,112,127,140]). Another aspect of the patient-physician relationship are stigmas (e.g. [54,189,280]). For example, stigma about HIV pre-exposure prophylaxis, as it relates to black transgender women, results in stereotyping, which undermines trust and deters SDM in this area [280].

3.5.4. The involvement of relatives

Another explanation on the micro level is the involvement of relatives in SDM (e.g. [54,113,118,127,281]). Patients could experience the involvement of relatives as supportive (e.g. [21,33,35,58,60–62,83,84, 86,89,98,114,129,130,140,278]) if they feel emotionally supported by them and consider treatment options with them (e.g. [21,35,62,84,98, 129,140]). In addition, relatives could function as interpreters (e.g. [61, 98]). This may lead to greater patient honesty, trust, and comfort, and thereby serve to improve their experience of SDM (e.g. [140]). However, there are patients who experience the involvement of relatives as opposing or complicating (e.g. [21,55,84,87]). For example, when they feel excluded (e.g. [55]) or when they experience pressure from their relatives to choose a specific treatment (e.g. [84,87]). The involvement of peers can also contribute to the degree of SDM experienced (e.g. [280]).

3. Discussion and conclusion

4.1. Discussion

This scoping review aimed gaining insight into explanations for the differences in the degree of SDM experienced by patients. It also aimed to identify gaps in the literature. We found a wide variety of explanations that are related to these differences and structured them to a macro, meso, and micro level. However, we also found explanations, which were tested empirically, and which were not significantly related to the differences in the degrees of SDM (e.g. [180,194,282–338]). Nevertheless, most studies address explanations for these differences which are related to the micro level. In the literature, the nature of the initial diagnosis, patient-related factors, factors related to the healthcare professional, the relationship between the physician and patient, and the involvement of relatives are mentioned. However, the studies address fewer explanations for the differences in the degree of SDM on the meso and macro levels. On the meso level, studies outline explanations related to the continuity of care and the involvement of other healthcare professionals. On the macro level, studies outline explanations related to restrictions within the healthcare system and receiving adequate information about treatment options. Despite all efforts over the last decade to improve SDM, these findings are consistent with the findings of Joseph-Williams and colleagues from 2014. It was already clear, solely from the patients perspective, that relatively little was known about the relationship between factors on the different levels of the healthcare system and healthcare organizations, and the degree of SDM [23].

Explanations for the differences in the degrees of SDM have been presented in specific categories and isolated levels in order to gain insight into explanations that could be managed on the different levels. Undoubtedly, that is an oversimplification of the reality because the macro, meso, and micro levels are interrelated [27]. Based on our results, explanations are linked to a macro, meso, and micro level, while the explanations could be interrelated with each other. For a better understanding of differences in the degree of SDM experienced by patients, the mechanisms behind these explanations are important. For example, the way patients' beliefs or prejudices affect their trust in healthcare professionals could be an explanation for the degree of SDM experienced. Ahmad and colleagues (2021) suggest that patients' perceptions concerning the gender and ethnicity of their healthcare professional offering diabetes care shapes their trust in them and indirectly influences their participation in SDM [233]. Another example concerns the mechanisms behind the lack of time to make an informed decision. The lack of time can be a barrier to the degree of SDM experienced by patients in several ways. For instance, the lack of time can result in physicians being stressed, which in turn may lead to a reduced level of information sharing, and a reduced rate of patient enquiries [60].

We conclude that SDM is not an isolated process between the physician and patient, as frequently assumed in healthcare policy. In line with Moleman et al. (2020) [82], we are convinced that understanding SDM as a process of interactions that transcend the conversation between the physician and patient in the consulting room offers new opportunities to understand better the differences in the degree of SDM experienced by patients and offers new opportunities to increase the degree of SDM experienced by patients.

4.2. Practice implications

This scoping review suggests that SDM is viewed too narrowly. Studies to date, focus mainly on explanations related to the micro level. Accordingly, this scoping review provides implications for researchers and policymakers. In line with the conclusion of Scholl et al. (2018) that organizations should consider the role of organizational- and system level characteristics in order to improve the implementation of SDM [24], researchers and policymakers could focus more on explanations related to the macro and meso levels as well, in order to gain more insight into explanations for the degrees of SDM and to increase these degrees experienced by patients. Degrees which have remained stable despite efforts on the micro level. In addition, it is important that the interrelation between the macro, meso, and micro levels are kept in mind and thereby the interrelation of explanations for the differences in the degree of SDM experienced by patients.

Therefore, in general, further research could focus on the way explanations are interrelated and how they affect the degree of SDM experienced by patients. For instance, several studies, mainly based on interviews with patients, indicate that they require more time during consultations to make an informed decision (e.g. [46,47,57–75]). However, these findings do not seem to be confirmed through experiments. Therefore, more experimental research could help to understand whether extending consultation time actually contributes to the degree of SDM experienced by patients. In doing so, it would help to understand differences in degrees of SDM by also understanding how extending consultation time is related to mechanisms on the meso and micro levels since these levels are interrelated. Subsequently, it could be relevant to research to what extent the associated costs for extending consultation time outweighs benefits for patients and healthcare providers. Factors such as the satisfaction with any decision, the reduction of unwarranted variation in healthcare, and better healthcare alignment, could be considered [9,15,22]. Related to cost-benefit trade-offs, such experimental research could possibly include the use of real-time video conferencing technology, or telemedicine, since telemedicine is increasingly seen as a strategy for healthcare organizations to save costs [339].

Based on the results of this scoping review, improvements in SDM could be achieved if policymakers could be made more aware of mechanisms which have connections to the micro, meso, and macro levels when implementing interventions such as decision aids or a training for healthcare professionals. This conclusion is in line with that of Scholl et al. (2021). They suggest, after evaluating a multi-component SDM implementation program, that successful implementation of SDM on the department level requires changes on the organizational level too [340]. Policies could be adjusted specifically on the macro and meso levels in order to have an impact upon the degree of SDM experienced by patients on the micro level. Therefore, we expect minor changes in the degrees of SDM experienced when interventions are not embedded on the macro, meso, and micro levels.

For instance, the literature suggests that on the micro level, patients understanding of treatment options is important (e.g. [57,62,82]). Many studies have been conducted to evaluate the effectiveness of information tools (e.g. [128,204–221]), such as decision aids (e.g. [204–213,216]) in order to improve patients understanding of treatment options and thereby the degree of SDM experienced by patients. However, patients may still experience limiting factors. On the micro level, for example, this could be due to a physician adopting a didactic attitude. On the meso level, this could be due to the structured nature of consultations. And, finally, on the macro level, this could be due to time constraints.

This scoping review has several limitations. Even though two authors screened all articles by title and abstract, it might be possible that we missed relevant articles. However, the conservative eligibility and exclusion criteria contribute to the quality of the scoping review by reducing the risk of including studies inappropriately. Additionally, due to the substantial number of articles included, we had to make choices and could not do justice to every explanation. Therefore, it might be possible that we missed some explanations. Nevertheless, we are convinced that we outlined the most important explanations and provide a comprehensive review of explanations for differences in the degrees of SDM experienced by patients.

Another limitation is related to organizing the broader categories of explanations into macro, meso, and micro levels. Some explanations are related to several levels. For example, ‘information’. On the micro level patients should understand information about treatment options. On the meso level patients must receive information about treatment options in a timely manner, which could be seen as a responsibility of the healthcare organization that establishes pathways and, on the macro level it is important that reliable information about treatment options exists at all, which could be seen as a responsibility of the government. Nevertheless, the macro, meso, and micro levels provide a helpful framework for ordering the explanations for patients’ experienced degree of SDM and for identifying gaps in the literature on this subject.

Furthermore, the findings came from a wide range of studies each with its own study design. As a result, the quality of the studies included is variable. Furthermore, as mentioned in the introduction, SDM is dependent upon different situations. Therefore, the explanations cannot be applied to every context. However, this scoping review gives an overview of explanations for differences in the degrees of SDM experienced by patients and outlines the relevant gaps in the literature.

4.3. Conclusion

Based on literature, we conclude that SDM is not an isolated process between the physician and patient. Explanations for differences in the degrees of SDM experienced by patients interact on macro, meso, and micro levels. SDM is a process of interactions that transcends the conversation between the physician and patient in the consulting room. Seeing it as such offers new opportunities to understand better the different degrees of SDM experienced and offers new opportunities for improvements in these degrees. In order to improve the degree of SDM experienced by patients, this scoping review suggests that researchers and policymakers could focus more on explanations related to the macro and meso levels, and on how explanations on different levels are interrelated.

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Declaration of Competing Interest

The authors declare that they have no competing interests.

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I confirm all patient/personal identifiers have been removed or disguised so the patient/person(s) described are not identifiable and cannot be identified through the details of the story.

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Tables and figures

Table 1 Search strategy conducted in PubMed.

#1	"Decision Making, Shared"[Mesh] OR "shared decision mak* "[tiab] OR "shared decisionmak* "[tiab] OR "SDM"[tiab] OR ("Decision Making"[Mesh:NoExp] AND (shar*[tiab] OR cooperat*[tiab] OR collaborat*[tiab] OR together[tiab]))
#2	"Patient Satisfaction"[Mesh] OR "Patient Participation"[Mesh] OR (("Attitude"[Mesh] OR perspective*[tiab] OR experienc*[tiab] OR view*[tiab] OR perception*[tiab] OR opinion*[tiab] OR prefer*[tiab] OR satisf*[tiab] OR involv*[tiab] OR participat*[tiab] OR attitude*[tiab] OR reflecti*[tiab] OR engag*) AND ("patients"[Mesh] OR patient*[tiab] OR client*[tiab] OR consumer*[tiab]))
#3	#1 AND #2
#4	#3 NOT (("Adolescent"[Mesh] OR "Child"[Mesh] OR "Infant"[Mesh] OR adolescen*[tiab] OR child*[tiab] OR schoolchild*[tiab] OR infant*[tiab] OR girl*[tiab] OR boy[tiab] OR boys[tiab] OR boyhood[tiab] OR teen[tiab] OR teens[tiab] OR teenager*[tiab] OR youth*[tiab] OR pediatr*[tiab] OR paediatr*[tiab] OR puber*[tiab]) NOT ("Adult"[Mesh] OR adult*[tiab] OR man[tiab] OR men[tiab] OR woman[tiab] OR women[tiab])) NOT ("Animals"[Mesh] NOT "Humans"[Mesh])

Table 2 Search strategy conducted in Embase.

#1	'shared decision making'/exp OR 'shared decision mak* ':ab,ti,kw OR 'shared decisionmak* ':ab,ti,kw OR sdm:ab,ti,kw OR (('decision making'/de OR 'clinical decision making'/de OR 'medical decision making'/de OR 'patient decision making'/de) AND (shar*:ab,ti,kw OR cooperat*:ab,ti,kw OR collaborat*:ab,ti,kw OR together:ab,ti,kw))
#2	'patient attitude'/de OR 'patient preference'/exp OR 'patient satisfaction'/exp OR 'patient participation'/exp OR 'patient engagement'/exp OR (('attitude'/exp OR perspective*:ti,ab,kw OR experienc*:ti,ab,kw OR view*:ti,ab,kw OR perception*:ti,ab,kw OR opinion*:ti,ab,kw OR prefer*:ti,ab,kw OR satisf*:ti,ab,kw OR involv*:ti,ab,kw OR participat*:ti,ab,kw OR attitude*:ti,ab,kw OR reflecti*:ti,ab,kw OR engag*:ti,ab,kw) AND ('patient'/exp OR patient*:ti,ab,kw OR client*:ti,ab,kw OR consumer*:ti,ab,kw))
#3	#1 AND #2
#4	#3 NOT (('adolescent'/exp OR 'child'/exp OR adolescent*:ti,ab,kw OR child*:ti,ab,kw OR schoolchild*:ti,ab,kw OR infant*:ti,ab,kw OR girl*:ti,ab,kw OR boy*:ti,ab,kw OR teen:ti,ab,kw OR teens:ti,ab,kw OR teenager*:ti,ab,kw OR youth*:ti,ab,kw OR pediatr*:ti,ab,kw OR paediatr*:ti,ab,kw OR puber*:ti,ab,kw) NOT ('adult'/exp OR 'aged'/exp OR 'middle aged'/exp OR adult*:ti,ab,kw OR man:ti,ab,kw OR men:ti,ab,kw OR woman:ti,ab,kw OR women:ti,ab,kw)) NOT ([animals]/lim NOT [humans]/lim)

Table 3 Search strategy conducted in CINAHL.

S1	MH "Decision Making, Shared" OR TI ("shared decision mak*" OR "shared decisionmak*" OR SDM) OR AB ("shared decision mak*" OR "shared decisionmak*" OR SDM) OR (MH ("Decision Making" OR "Decision Making, Patient" OR "Decision Making, Clinical") AND (TI (shar* OR cooperat* OR collaborat* OR together) OR AB (shar* OR cooperat* OR collaborat* OR together))
S2	MH ("Patient Preference" OR "Patient Satisfaction" OR "Consumer Participation") OR ((MH "Attitude+" OR TI (perspective* OR experienc* OR view* OR perception* OR opinion* OR prefer* OR satisfact* OR involv* OR participat* OR attitude* OR reflecti* OR engag*) OR (perspective* OR experienc* OR view* OR perception* OR opinion* OR prefer* OR satisfact* OR involv* OR participat* OR attitude* OR reflecti* OR engag*)) AND ((MH "Patients+") OR TI (patient* OR client* OR consumer*) OR AB (patient* OR client* OR consumer*))
S3	S1 AND S2
S4	S3 NOT ((MH ("Adolescence" OR "Child+") OR TI (adolescen* OR child* OR schoolchild* OR infant* OR girl* OR boy* OR teen OR teens OR teenager* OR youth* OR pediatr* OR paediatr* OR puber*) OR AB (adolescen* OR child* OR schoolchild* OR infant* OR girl* OR boy* OR teen OR teens OR teenager* OR youth* OR pediatr* OR paediatr* OR puber*)) NOT (MH ("Adult+") OR TI (adult* OR man OR men OR woman OR women) OR AB (adult* OR man OR men OR woman OR women))) NOT (MH "Animals" NOT MH "Human")

Figure 1 Flow diagram of the study selection.

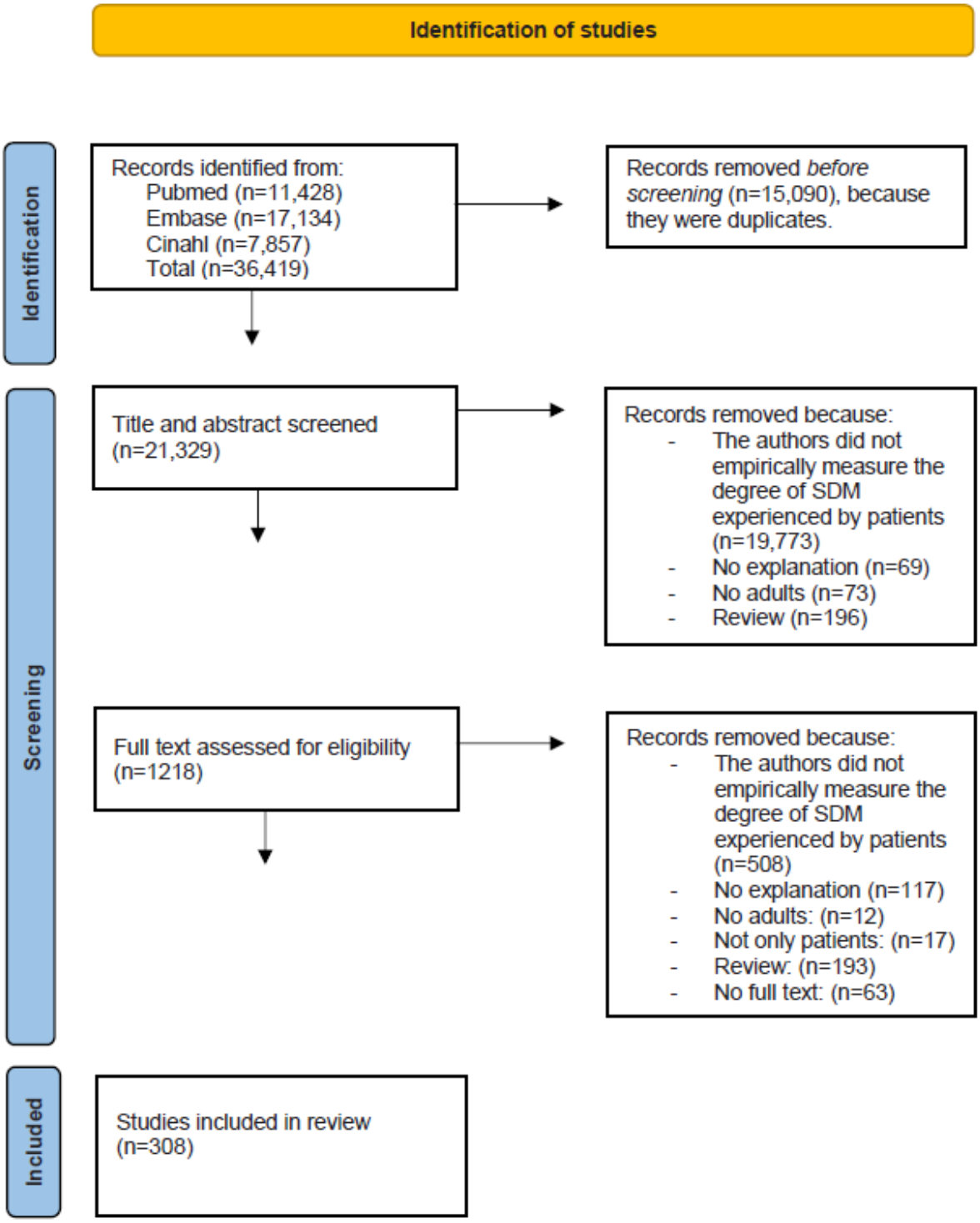

Table 4 Overview of the studies included.

	First author, year of publication, country of origin, and citation number	Design and method (s) used to measure the degree of SDM experienced by patients	Type of sampling[a] and patient sample size (n) among whom the degree of SDM has been measured	Disease or healthcare setting	Categories of the empirically tested explanation (s) for the degree of SDM experienced by patients
1	Aarts, J.W.M., 2021, United States,[206]	Experimental, questionnaire	Nonprobability sampling, n = 57	Heavy menstrual bleeding and/or symptomatic uterine fibroids	• Tools
2	Abate, A.W., 2023, Malawi, [54]	Observational, questionnaire and interviews	Nonprobability sampling, n = 423 and n = 21	Mental illness	• Patient characteristics • Contextual factors • Involvement of another healthcare professional • Healthcare professionals' skills
3	Abousheishaa, A.A., 2021, Malaysia,[207]	Experimental, questionnaire	Nonprobability sampling, n = 378	Major depressive disorder	• Tools
4	Adarkwah, C.C., 2016, Germany,[311]	Experimental, questionnaire	Nonprobability sampling, n = 304	Cardiovascular risk	• Tools
5	Ahmad, T., 2021, Canada, [233]	Observational, interviews	Nonprobability sampling, n = 28	Diabetes	• Patient-physician relationship
6	Albaroudi, A., 2022, United States,[193]	Observational, questionnaire	Nonprobability sampling, n = 568368	Alzheimer disease	• Patient characteristics
7	Alegria, M., 2018, United States,[305]	Experimental, questionnaire	Nonprobability sampling, n = 312	Psychotherapy and pharmacologic services	• Training for healthcare professionals
8	Allen, J. D., United States, 2020,[208]	Experimental, questionnaire	Nonprobability sampling, n = 45	Prostate cancer screening	• Tools
9	Almario, C.V., 2016, United States,[322]	Experimental, questionnaire	Nonprobability sampling, n = 371	Active gastrointestinal symptoms	• Tools
10	Almario, C.V., 2022, United States,[326]	Experimental, questionnaire	n = 128	Inflammatory bowel disease	• Tools
11	AlSarhan, M.A., 2021, Saudi-Arabia,[244]	Observational, questionnaire	Probability sampling, n = 144	Dental implants	• Patient characteristics • Healthcare professionals characteristics
12	Aminaie, N., 2019, Iran,[282]	Observational, questionnaire	Nonprobability sampling, n = 328	Breast cancer	• Patient preference for involvement
13	Andersen-Hollekim, T., 2021, Norway,[47]	Observational, interviews	Nonprobability sampling, n = 19	Breast cancer, prostate cancer, and malignant melanoma	• Patient-physician relationship • Contextual factors • Health conditions
14	Ankersmid, J.W., 2023, the Netherlands,[115]	Observational, interviews	Nonprobability sampling, n = 22	Breast cancer	• Information
15	Ankolekar, A., 2021, the Netherlands,[238]	Observational, questionnaire	Nonprobability sampling, n = 25	Extensive-stage small-cell lung cancer	• Patient preference for involvement
16	Aoki, Y., 2019, Japan,[137]	Experimental, questionnaire	Nonprobability sampling, n = 88	DSM-IV diagnosis of major depressive episode	• Tools • Involvement of another healthcare professional • SDM process
17	Aoki, Y., 2019, Japan,[90]	Observational, interviews	Nonprobability sampling, n = 10	Psychiatric (e.g. bipolar disorder, and depression)	• Information • Health conditions • Involvement of relatives
18	Attanasio, L.B., 2018, United States,[49]	Observational, interviews	n = 2787	First childbirth	• Patient characteristics • Health conditions
19	Baca-Dietz, D., 2020, United States,[252]	Observational, interviews	Nonprobability sampling, n = 6	Chronic condition	• Healthcare professionals' skills
20	Baicus, C., 2019, Romania, [143]	Observational, questionnaire	Nonprobability sampling, n = 665	Atrial fibrillation or/and collagen-vascular diseases	• Health conditions • Patient characteristics • Contextual factors
21	Baijens, S.W.E., 2018, the Netherlands,[283]	Experimental, questionnaire	Nonprobability sampling, n = 62	Childbirth	• Tools
22	Bansback, N., 2021, Canada, [209]	Experimental, questionnaire	Nonprobability sampling, n = 45	Clinically isolated syndrome, primary-progressive MS, or secondary-progressive MS	• Tools
23	Barr, P.J., 2019, United States, [312]	Experimental, questionnaire	Nonprobability sampling, n = 24	Depression	• Tools
24	Barr, P.J., 2016, United States, [144]	Observational, questionnaire	Nonprobability sampling, n = 972	Depression	• Patient characteristics • Health conditions
25	Bartlett, S.J., 2020, United States,[214]	Observational, questionnaire and interviews	Nonprobability sampling, questionnaire n = 196 and interviews n = 9	Rheumatism	• Tools
26	Becher, S., 2021, Germany, [38]	Experimental, interviews	Nonprobability sampling, n = 18	Schizophrenia or schizoaffective disorder	• Health conditions • Healthcare professionals' skills • SDM process • Other
27	Beyene, L.S., 2019, Norway, [91]	Observational, interviews	Nonprobability sampling, n = 16	Mental care (e.g. depression, psychosis, emotional unstable personality disorder, and suicidal)	• Healthcare professionals' skills • Information

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Table 4 (continued)

	First author, year of publication, country of origin, and citation number	Design and method (s) used to measure the degree of SDM experienced by patients	Type of sampling[a] and patient sample size (n) among whom the degree of SDM has been measured	Disease or healthcare setting	Categories of the empirically tested explanation (s) for the degree of SDM experienced by patients
28	Bi, S., 2019, United States, [189]	Observational, interviews and focus groups	Nonprobability sampling, interviews n = 40 and focus groups n = 10	Asian American Pacific Islander Sexual and Gender Minorities	• Healthcare professionals' skills • Patient characteristics
29	Bossen, J.K.J., 2022, the Netherlands,[194]	Experimental, questionnaire	Nonprobability sampling, n = 317	Hip or knee osteoarthritis	• Tools • Training for healthcare professionals • Information • Patient characteristics • Health conditions
30	Brito, J.P., 2015, United States,[323]	Experimental, questionnaire	Nonprobability sampling, n = 68	Graves' Disease	• Tools
31	Brodney, S., 2019, United States,[215]	Observational, questionnaire	Nonprobability sampling, n = 649	Hip or knee osteoarthritis, lumbar herniated disc, or lumbar spinal stenosis	• Tools
32	Brodney, S., 2020, United States,[195]	Observational, questionnaire	Probability sampling, n = 3396	Depression	• Patient characteristics
33	Brodney, S., 2022, United States,[183]	Observational, questionnaire	Nonprobability sampling, n = 494	Depression	• Patient characteristics
34	Brotzman, L.E., 2021, United States,[92]	Observational, interviews	Nonprobability sampling, n = 31	Stage II colon cancer	• Information • Healthcare professionals' skills
35	Brown, E.L., 2022, United Kingdom,[48]	Observational, focus groups	Nonprobability sampling, n = 8	Older people with multimorbidity	• Patient-physician relationship • Contextual factors
36	Buizza, C., 2021, Italy,[281]	Experimental, questionnaire	Nonprobability sampling, n = 308	Breast cancer	• Contextual factors • Involvement of relatives
37	Burton, D., 2010, United Kingdom,[239]	Observational, questionnaire	Nonprobability sampling, n = 85	Elective diagnostic coronary arteriography	• Healthcare professionals' skills • Patient preference for involvement
38	Bustos C.V., 2021, Spain,[60]	Observational, interviews	Nonprobability sampling, n = 10	Inflammatory bowel disease	• Patient-physician relationship • Involvement of relatives • Involvement of another healthcare professional • Contextual factors • Health conditions
39	Butterworth, J.E., 2014, United Kingdom,[63]	Observational, interviews	Nonprobability sampling, n = 22	Different	• Patient characteristics • Healthcare professionals' skills • Contextual factors • Other • Information
40	Chang, H., 2019, Taiwan, [196]	Observational, questionnaire	Nonprobability sampling, n = 120	Different cancers	• Patient characteristics
41	Chang, H., 2023, Taiwan, [134]	Observational, questionnaire	Nonprobability sampling, n = 30	Diabetes	• Involvement of another healthcare professional
42	Chen, C., 2022, Taiwan,[197]	Observational, questionnaire	Nonprobability sampling, n = 132	Lumbar degenerative diseases	• Patient characteristics • Other • Patient preference for involvement • SDM process
43	Chen, C., 2021, Taiwan,[216]	Experimental, questionnaire	Nonprobability sampling, n = 128	Low back pain, spinal stenosis, intervertebral disc disorders, spondylolisthesis, and other spondylosis	• Tools
44	Cheung, E.H., 2022, United States,[333]	Observational, questionnaire	n = 89	Psychiatry	• Health conditions • Other
45	Cichocki, M.N., 2022, United States,[111]	Observational, interviews	Nonprobability sampling, n = 30	Dupuytren contracture	• Information • Healthcare professionals' skills
46	Ciria-Suarez, L., 2020, Spain, [166]	Observational, questionnaire	Nonprobability sampling, n = 281	Breast cancer	• Health conditions
47	Cleveland, C., 2022, United States,[169]	Observational, questionnaire	Nonprobability sampling, n = 118	Otolaryngology	• Health conditions • Patient characteristics
48	Coates, D., 2021, Australia, [64]	Observational, interviews	Nonprobability sampling, n = 32	Induction of labour	• Information • Healthcare professionals' skills • Patient preference for involvement • Contextual factors
49	Deinzer, A., 2009, Germany, [260]	Experimental, questionnaire	Nonprobability sampling, n = 86	Lowering blood pressure in hypertension	• Training for healthcare professionals
50	De las Cuevas, C., 2014, Spain, [145]	Observational, questionnaire	Nonprobability sampling, n = 846	Psychiatric disorders	• Health conditions

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Table 4 (continued)

	First author, year of publication, country of origin, and citation number	Design and method (s) used to measure the degree of SDM experienced by patients	Type of sampling[a] and patient sample size (n) among whom the degree of SDM has been measured	Disease or healthcare setting	Categories of the empirically tested explanation (s) for the degree of SDM experienced by patients
51	De las Cuevas, C., 2013, Spain, [284]	Observational, questionnaire	Nonprobability sampling, n = 1477	Different	• Health conditions
52	Del Cura-González, I., 2022, Spain,[332]	Experimental, questionnaire	Probability sampling, n = 546	Multimorbidity and Polypharmacy	• Training for healthcare professionals
53	De Ligt, K.M., 2018, the Netherlands,[141]	Observational, questionnaire	Nonprobability sampling, n = 510	Immediate breast reconstruction	• Health conditions
54	Del Piccolo, L., 2014, Italy, [285]	Observational, questionnaire	Nonprobability sampling, n = 70	Breast cancer	• Involvement of relatives
55	Deniz, S., 2021, Turkey,[270]	Observational, questionnaire	Nonprobability sampling, n = 399	Different	• Patient-physician relationship
56	Den Ouden, 2022, the Netherlands,[226]	Experimental, questionnaire	Nonprobability sampling, n = 46	Diabetes type 2	• Tools
57	DeRosa, A.P., 2022, United States,[114]	Observational, interviews	Nonprobability sampling, n = 6	Breast cancer	• Involvement of relatives • Information • Patient-physician relationship
58	de Toro, J., 2020, Spain,[240]	Observational, questionnaire	Nonprobability sampling, n = 592	Inflammatory rheumatic diseases	• Patient preference for involvement
59	Drost, L.E., 2023, the Netherlands,[331]	Experimental, questionnaire	n = 215	Pelvic organ prolapse	• Tools
60	Drummond, L., 2023, United Kingdom,[113]	Observational, questionnaire	Nonprobability sampling, n = 39453	Acute hospitals	• Healthcare professionals' skills • Contextual factors • Information • Health conditions • Involvement of relatives • Involvement of another healthcare professional
61	Durand, M.A., 2021, United States,[210]	Experimental, questionnaire	n = 571	Breast cancer	• Tools
62	Durif-Bruckert, C., 2014, France,[93]	Observational, interviews	Nonprobability sampling, n = 14	Breast cancer	• Information • Patient preference for involvement
63	Edwards, A., 2006, United States,[65]	Observational, interviews	Nonprobability sampling, n = 17	Breast cancer	• Patient-physician relationship • Healthcare professionals' skills • Contextual factors • Information
64	Elliott, M.J., 2023, Canada, [122]	Observational, interviews	Nonprobability sampling, n = 19	Hemodialysis	• Contextual factors • Information • Health conditions
65	Eliacin, J., 2015, United States,[271]	Observational, interviews	Nonprobability sampling, n = 54	Mental health (e.g. mood disorders, PTSD and schizophrenia)	• Patient-physician relationship • Other
66	Eliacin, J., 2015, United States,[236]	Observational, interviews	Nonprobability sampling, n = 54	Psychiatric conditions such as mood disorders, PTSD, and schizophrenia	• Patient-physician relationship • Healthcare professionals' skills
67	Etingen, B., 2015, United States,[34]	Observational, questionnaire	Probability sampling, n = 5512	Inpatient and outpatient healthcare for veterans	• Other
68	Fabricius, P.K., 2022, Denmark,[79]	Observational, interviews	Nonprobability sampling, n = 14	Emergency department	• Healthcare professionals' skills • Patient characteristics • Contextual factors
69	Feiten, S., 2022, Germany, [184]	Observational, questionnaire	Probability sampling, n = 563	Breast cancer	• Patient characteristics
70	Ferguson, S., 2016, United States,[277]	Observational, questionnaire	n = 68	Lupus	• Healthcare professionals' skills • Patient-physician relationship
71	Finderup, J., 2019, Denmark, [83]	Observational, interviews	Nonprobability sampling, n = 29	Chronic kidney disease	• Healthcare professionals' skills • Involvement of relatives • Tools • Information
72	Finderup, J., 2021, Denmark, [133]	Observational, interviews	Nonprobability sampling, n = 13	Chronic kidney disease	• Tools • Involvement of another healthcare professional • Healthcare professionals' skills
73	Finderup, J., 2020, Denmark, [286]	Observational, questionnaire	Nonprobability sampling, n = 148	Kidney disease	• Other

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74	Finnikin, S., 2019, United Kingdom,[235]	Observational, questionnaire	n = 120	Different	• Patient preference for involvement
75	Forcino, R.C., 2018, United States,[175]	Observational, questionnaire	Probability sampling, n = 37917	Different	• Patient characteristics • Contextual factors
76	Forcino, R.C., 2020, United States,[176]	Observational, questionnaire	Nonprobability sampling, n = 31265	Different	• Patient characteristics • Health conditions
77	Fossa, A.J., 2018, United States,[217]	Observational, questionnaire	Probability sampling, n = 6316	Different	• Information
78	Fowler, F.J., 2013, United States,[177]	Observational, questionnaire	Probability sampling, n = 2718	Colon cancer screening, breast cancer screening, prostate cancer screening, blood pressure medication, cholesterol medication, depression medication, knee replacement, hip replacement, low back, and cataract	• Patient characteristics • Health conditions
79	Fraenkel, L., 2007, United States,[66]	Observational, interviews	Nonprobability sampling, n = 26	Osteoporosis	• SDM process • Patient characteristics • Healthcare professionals' skills • Contextual factors
80	Frazier, R., 2022, United States,[116]	Observational, questionnaire	n = 350	Chronic kidney disease	• Patient characteristics • Health conditions • Information • Other
81	Freites-Martinez, A., 2022, United States,[330]	Observational, questionnaire	n = 61	Breast cancer and gynecologic cancer	• Health conditions
82	Frongillo, M., 2013, United States,[250]	Observational, questionnaire	Nonprobability sampling, n = 440	Breast cancer	• Healthcare professionals' skills
83	Fuller, S.M., 2017, United States,[146]	Observational, interviews	Nonprobability sampling, n = 53	HIV	• Health conditions • Patient preference for involvement • Patient-physician relationship • Other
84	Fullwood, C., 2012, United Kingdom,[147]	Experimental, questionnaire	Nonprobability sampling, n = 2965	Chronic conditions (focus on with diabetes, chronic obstructive pulmonary disease, and irritable bowel syndrome)	• Health conditions • Patient characteristics
85	García-García, T., 2019, Spain, [148]	Observational, questionnaire	n = 497	Breast cancer and colon cancer	• Health conditions
86	Garvelink, M.M., 2019, the Netherlands,[287]	Experimental, questionnaire and interviews	Nonprobability sampling, questionnaire n = 138 and interviews n = 12	Different	• Tools
87	Gaster, C., 2021, Germany, [288]	Observational, questionnaire	Nonprobability sampling, n = 71	Cancer	• Patient characteristics
88	Geerts, P.A.F., 2020, the Netherlands,[173]	Observational, questionnaire	Nonprobability sampling, n = 95	Hematologic malignancy	• Patient characteristics
89	Geessink, N.H., 2018, the Netherlands,[142]	Observational, questionnaire	Nonprobability sampling, n = 80	Colorectal and pancreatic cancer	• Patient characteristics • Health conditions
90	Geessink, N.H., 2017, the Netherlands,[259]	Experimental, questionnaire	Nonprobability sampling, n = 94	Colorectal and pancreatic cancer	• Training for healthcare professionals
91	Geiger, F., 2017, Germany, [261]	Experimental, questionnaire	Nonprobability sampling, n = 152	Different	• Training for healthcare professionals
92	Georgopoulou, S., 2020, United Kingdom,[188]	Observational, questionnaire	Nonprobability sampling, n = 98	Lupus nephritis	• Patient-physician relationship • Patient characteristics • SDM process
93	Ghodsian, S., 2021, Iran,[149]	Observational, questionnaire	Nonprobability sampling, n = 300	Chronic kidney disease	• Patient characteristics • Health conditions
94	Gibson, A., 2019, United Kingdom,[253]	Observational, interviews	Nonprobability sampling, n = 14	Depression	• Healthcare professionals' skills • Other • Tools
95	Gillespie, R., 2022, Australia, [121]	Observational, interviews	Nonprobability sampling, n = 25	Community-living older adults	• Patient-physician relationship • Information
96	Golden, S.E., 2020, United States,[94]	Observational, interviews	n = 51	Lung cancer screening	• Information • Patient-physician relationship • Tools
97	Goscha, R., 2015, United States,[128]	Observational, interviews	Nonprobability sampling, n = 12	Chronic mental illness including schizophrenia and other psychotic disorders	• Patient-physician relationship • Involvement of another healthcare professional • Tools

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98	Graber, J., 2022, United States,[46]	Observational, interviews	Nonprobability sampling, n = 20	Osteoarthritis	• SDM process • Information • Contextual factors • SDM process • Other • Patient characteristics
99	Grant, R.L., 2020, United States,[251]	Observational, questionnaire	Nonprobability sampling, n = 669	Different	• Healthcare professionals' skills
100	Griffioen, I.P.M., 2021, the Netherlands,[95]	Observational, interviews	n = 13	Locally advanced pancreatic cancer	• SDM process • Healthcare professionals' skills • Information
101	Grim, K., 2016, Sweden,[61]	Observational, focus groups	Nonprobability sampling, n = 22	Psychiatric disorder	• Involvement of relatives • Tools • Information • SDM process • Healthcare professionals' skills • Patient-physician relationship • Contextual factors • Health conditions
102	Gröger, S., 2019, Germany, [231]	Observational, interviews	Nonprobability sampling, n = 8	Prostate Cancer	• Information • Healthcare professionals' skills
103	Grüne, B., 2021, Germany, [191]	Observational, questionnaire	n = 372	Urology	• Patient characteristics • Contextual factors • Health conditions • Other
104	Gunn, C.M., 2020, United States,[88]	Observational, interviews	Nonprobability sampling, n = 25	Mammography	• Information • Involvement of another healthcare professional
105	Hahlweg, P., 2020, Germany, [150]	Observational, questionnaire	Probability sampling, n = 4020	Malignant tumor	• Health conditions • Patient characteristics
106	Halbert, C.H., 2017, United States,[245]	Observational, questionnaire	Nonprobability sampling, n = 282	Overweight or obese	• Healthcare professionals' skills
107	Hamann, J., 2020, Germany, [262]	Experimental, questionnaire	Nonprobability sampling, n = 322	Schizophrenia or schizoaffective disorder	• Training for healthcare professionals • Training for patients
108	Hamann, J., 2016, Germany, [230]	Observational, focus groups	Nonprobability sampling, n = 16	Schizophrenia/schizoaffective psychosis, depression, and bipolar disorder	• Other • Information • Patient-physician relationship
109	Hamann, J., 2006, Germany, [221]	Experimental, questionnaire	Nonprobability sampling, n = 107	Schizophrenia or schizophreniform disorder	• Tools
110	Haugom, E.W., 2022, Norway, [120]	Observational, interviews	Nonprobability sampling, n = 10	Psychotic disorder	• Information • Patient-physician relationship • Healthcare professionals' skills
111	Hawkins, A.T., 2023, United States,[327]	Experimental, questionnaire	Probability sampling, n = 387	General surgery	• Other
112	Henn, D., 2020, United States, [289]	Experimental, questionnaire	Nonprobability sampling, n = 28	Breast reconstruction	• Training for patients
113	Henselmans, I., 2020, the Netherlands,[204]	Experimental, questionnaire	Nonprobability sampling, n = 163	Metastatic or inoperable tumors	• Tools • Training for healthcare professionals
114	Hernández, R., 2019, Spain, [181]	Observational, questionnaire	Nonprobability sampling, n = 92	Cancer	• Patient characteristics
115	Hernandez, S.E., 2016, United States,[192]	Observational, questionnaire	Probability sampling, n = 827	Different	• Patient characteristics
116	Heuser, C., 2023, Germany, [135]	Observational, questionnaire	Nonprobability sampling, n = 317	Breast cancer	• Involvement of another healthcare professional
117	Hirpara, D.H., 2016, Canada, [140]	Observational, interviews	Nonprobability sampling, n = 20	Colorectal cancer	• Involvement of relatives • Healthcare professionals' skills • Information • Other • Patient characteristics • Health conditions
118	Ho, Y.F., 2021, Taiwan,[129]	Observational, interviews	Nonprobability sampling, n = 31	Chronic kidney disease	• Involvement of relatives • Involvement of another healthcare professional

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119	Ho, Y.F., 2022, Taiwan,[123]	Observational, interviews	Nonprobability sampling, n = 15	Peritoneal dialysis	• SDM process • Information
120	Hoffman, R.M., 2014, United States,[302]	Observational, questionnaire	Nonprobability sampling, n = 2718	Cancer screening	• Other
121	Hofstede, S.N., 2013, the Netherlands,[67]	Observational, focus groups	Nonprobability sampling, n = 22	Sciatica	• Patient-physician relationship • Healthcare professionals' skills • Information • Patient preference for involvement • Contextual factors • Patient characteristics • Involvement of relatives
122	Holzhüter, F., 2021, Germany, [151]	Observational, questionnaire	Nonprobability sampling, n = 62	Psychiatric	• Other • Health conditions
123	Hopmans, W., 2015, the Netherlands,[96]	Observational, interviews	n = 11	Stage I non-small cell lung cancer	• Information
124	Huang, C., 2020, China,[55]	Observational, interviews	Nonprobability sampling, n = 12	Schizophrenia	• Healthcare professionals' skills • Involvement of relatives • Other • Information
125	Hughes, T.M., 2018, United States,[50]	Observational, questionnaire	n = 63931	Different	• Patient characteristics • Health conditions
126	Hulbaek, M., 2021, Denmark, [218]	Experimental, questionnaire	Nonprobability sampling, n = 46	Symptomatic pelvic organ prolapse	• Tools
127	Hung, C.H., 2022, Taiwan, [243]	Observational, questionnaire	Nonprobability sampling, n = 165	Emergency department, different	• Health conditions
128	Ibsen, C., 2021, Denmark, [223]	Experimental, questionnaire	Probability sampling, n = 376	Low back pain	• Tools
129	Ichikawa, T., 2023, Japan, [119]	Observational, questionnaire	n = 464	Systemic lupus erythematosus	• Information
130	Iobst, S.E., 2021, United States,[97]	Observational, interviews	Nonprobability sampling, n = 14	Labor and childbirth	• Information • Other • Patient-physician relationship • Contextual factors • Healthcare professionals' skills
131	Ismail, M.A., 2021, Malaysia, [152]	Observational, questionnaire	Nonprobability sampling, n = 86	Schizophrenia	• Patient characteristics • Health conditions • Patient preference for involvement
132	Jabour, S.M., 2019, United States,[68]	Observational, interviews	Nonprobability sampling, n = 20	Sickle cell disease	• Patient-physician relationship • Healthcare professionals' skills • Contextual factors
133	Jansen, J., 2019, Australia, [56]	Observational, interviews	Nonprobability sampling, n = 30	Cardiovascular disease	• SDM process • Information • Contextual factors • Patient-physician relationship
134	Janssen, C., 2009, Germany, [153]	Experimental, questionnaire	Nonprobability sampling, n = 90	Severe trauma	• Other • Health conditions • Patient characteristics
135	Jayakumar, P., 2021, United States,[211]	Experimental, questionnaire	Nonprobability sampling, n = 129	Knee osteoarthritis	• Tools
136	Jimenez-Fonseca, P., 2018, Spain,[154]	Observational, questionnaire	Nonprobability sampling, n = 602	Non-metastatic cancer	• Patient characteristics • Health conditions
137	Johnson, D.C., 2016, United States,[324]	Experimental, questionnaire	Nonprobability sampling, n = 109	Prostate cancer	• Tools
138	Johnson, R., 2021, United Kingdom,[69]	Observational, interviews	Nonprobability sampling, n = 11	Hypertension	• Information • SDM process • Contextual factors • Other
139	Jouni, H., 2017, United States, [313]	Experimental, questionnaire	Probability sampling, n = 207	Coronary heart disease	• Tools
140	Katz, D.A., 2013, United States,[125]	Observational, questionnaire	Nonprobability sampling, n = 1948	Different	• Contextual factors • Other

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141	Keij, S.M., 2021, the Netherlands,[62]	Observational, interviews	Nonprobability sampling, n = 15	Cancer and chronic diseases	• SDM process • Patient characteristics • Involvement of relatives • Health conditions • Patient-physician relationship • Contextual factors
142	Kerckhoffs, A.P.M., 2018, the Netherlands,[155]	Observational, interviews	Nonprobability sampling, n = 10	Bipolar disorder	• Healthcare professionals' skills • Health conditions
143	Kinsey, K., 2017, United Kingdom,[314]	Observational, interviews	Nonprobability sampling, n = 72	Knee osteoarthritis	• Tools
144	Kiselev, J., 2018, Germany, [70]	Observational, questionnaire and focus groups	Nonprobability sampling, questionnaire n = 283 and focus groups n = 9	Geriatric care	• Patient preference for involvement • Patient-physician relationship • Information • Contextual factors • Healthcare professionals' skills
145	Klaassen, L.A., 2018, the Netherlands,[308]	Experimental, questionnaire	Nonprobability sampling, n = 87	Breast cancer	• Tools
146	Koerner, M., 2014, Germany, [304]	Experimental, questionnaire	Nonprobability sampling, n = 1326	Rehabilitation	• Training for healthcare professionals
147	Kuo, K.M., 2022, Taiwan, [274]	Observational, questionnaire	Nonprobability sampling, n = 48	Chronic kidney disease	• Patient-physician relationship
148	Kupperman, M., 2020, United States,[315]	Experimental, questionnaire	Nonprobability sampling, n = 1485	Cesarean delivery	• Tools
149	Ladin, K., 2017, United States, [84]	Observational, interviews	Nonprobability sampling, n = 31	Dialysis	• SDM process • Other • Involvement of relatives • Information • Healthcare professionals' skills
150	Lane, 2021, United States, [227]	Experimental, questionnaire	Probability sampling, n = 430	Urology	• Tools
151	Latif, Z.P., 2019, United Kingdom,[131]	Experimental, questionnaire	Nonprobability sampling, n = 30	Gout	• Involvement of another healthcare professional
152	Lawhon, V.M., 2021, United States,[278]	Observational, interviews	Nonprobability sampling, n = 33	Oncology	• Involvement of relatives • Patient-physician relationship
153	Lee, P.Y., 2022, Malaysia,[80]	Observational, interviews	Nonprobability sampling, n = 12	Breast cancer	• Contextual factors • Healthcare professionals' skills • Involvement of relatives
154	Lee, Y.J., 2020, United States, [57]	Observational, focus groups	Nonprobability sampling, n = 26	Different	• SDM process • Contextual factors • Information • Patient characteristics • Health conditions • Healthcare professionals' skills
155	Leonard, C., 2022, United States,[242]	Observational, interviews	Nonprobability sampling, n = 12	Chronic limb threatening ischemia	• Healthcare professionals' skills • Patient-physician relationship
156	Leonard, C., 2023, United States,[110]	Observational, interviews	Probability sampling, n = 22	Lower-limb amputation	• Information • Healthcare professionals' skills • Involvement of another healthcare professional
157	Leu, S., 2023, United Kingdom,[328]	Experimental, questionnaire	Nonprobability sampling, n = 96	Brain tumor	• Training for healthcare professionals • Tools
158	Levine, D.M., 2017, United States,[51]	Observational, questionnaire	Nonprobability sampling, n = 21187	Different	• Patient characteristics • Health conditions • Other
159	Lin, C.Y, 2020, Taiwan,[71]	Observational, interviews	Nonprobability sampling, n = 20	Schizophrenia, bipolar disorder, and major depression	• Patient-physician relationship • Other • Contextual factors • Information

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Table 4 (continued)

	First author, year of publication, country of origin, and citation number	Design and method (s) used to measure the degree of SDM experienced by patients	Type of sampling[a] and patient sample size (n) among whom the degree of SDM has been measured	Disease or healthcare setting	Categories of the empirically tested explanation (s) for the degree of SDM experienced by patients
160	Linsky, A., 2018, United States,[198]	Observational, questionnaire	Probability sampling, n = 803	Polypharmacy	• Patient preference for involvement • Healthcare professionals' skills • Patient-physician relationship • Patient characteristics • Health conditions
161	Locatelli, S.M., 2016, United States,[290]	Observational, questionnaire	n = 450	Spinal cord injuries/disorders	• Patient characteristics • Health conditions
162	Lofland, J.H., 2017, United States,[156]	Observational, questionnaire	Nonprobability sampling, n = 306	Autoimmune diseases	• Patient characteristics • Health conditions
163	Loh, A., 2007, Germany,[263]	Experimental, questionnaire	n = 405	Depression	• Training for healthcare professionals • Information • Tools
164	Loos, S., 2013, Germany,[85]	Observational, focus groups	Nonprobability sampling, n = 23	Chronic mental illness	• Patient-physician relationship • Information
165	López-Toribio, M., 2021, Spain[109]	Observational, focus groups	Nonprobability sampling, n = 23	Childbirth	• Information
166	Lowenstein, L.M., 2020, United States,[132]	Experimental, questionnaire	n = 81	Lung cancer screening	• Involvement of another healthcare professional
167	Lowenstein, M., 2019, United States,[256]	Observational, interviews	Nonprobability sampling, n = 30	Lung cancer screening	• Healthcare professionals' skills
168	Lown, B.A., 2009, United States,[98]	Observational, research work groups	Nonprobability sampling, n = 44	A variety of chronic conditions, including diabetes, hypertension, rheumatoid arthritis, congestive heart failure, liver transplant, and chronic leukemia	• Patient-physician relationship • Other • Information • Healthcare professionals' skills • Involvement of relatives • Patient preference for involvement
169	Luo, H., 2021, China,[157]	Observational, questionnaire	Probability sampling, n = 2585	Different	• Health conditions • Contextual factors
170	MacDonald-Wilson, K.L., 2021, United States,[35]	Experimental, questionnaire and interviews	Questionnaire n = 2363 and interviews n = 35	Mental illness	• Tools • Patient characteristics
171	Mahlich, J., 2017, Japan, [158]	Observational, questionnaire	Nonprobability sampling, n = 1035	Inflammatory bowel disease	• Health conditions
172	Mahmoodi, N., 2019, United Kingdom,[234]	Observational, interviews	Nonprobability sampling, n = 20	Breast cancer	• Other
173	Mahone, I.H., 2011, United States,[99]	Observational, focus groups	n = 24	Dual diagnosis (mental health)	• Patient-physician relationship • Contextual factors • Other • Information • Healthcare professionals' skills
174	Mainz, H., 2022, Denmark, [334]	Experimental, questionnaire and interviews	Probability sampling questionnaire before n = 39 and after n = 50, and interviews n = 5	Anterior crucial ligament injury	• Patient characteristics • Tools
175	Makwero, M., 2022, Malawi, [201]	Observational, focus groups and interviews	Nonprobability sampling, n = 22 and n = 15	Diabetes	• Healthcare professionals' skills • Patient characteristics
176	Malekzadeh, E., 2022, Iran, [225]	Experimental, questionnaire	Nonprobability sampling, n = 154	Cervical cancer screening	• Tools
177	Manhas, K.P., 2020, Canada, [249]	Observational, questionnaire	Nonprobability sampling, n = 341	Rehabilitation	• Patient characteristics • Health conditions • SDM process • Contextual factors
178	Manhas, K.P., 2022, Canada, [126]	Observational, interviews	Nonprobability sampling, n = 17	Rehabilitation	• Patient-physician relationship • Healthcare professionals' skills • Other • Contextual factors
179	Manhas, K.P., 2020, Canada, [58]	Observational, interviews	Nonprobability sampling, n = 23	Rehabilitation	• Contextual factors • Healthcare professionals' skills • Patient characteristics

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					• Involvement of relatives • Involvement of another healthcare professional • Health conditions • Patient-physician relationship
180	Maples, N.J., 2021, United States,[72]	Observational, interviews	Nonprobability sampling, n = 15	Mental illness	• Healthcare professionals' skills • Other • Contextual factors
181	Martín-Fernández, R., 2013, Spain,[35]	Observational, interviews and focus groups	Nonprobability sampling, interviews n = 45 and focus groups n = 25	Breast cancer	• Health conditions • Patient characteristics • Other • Information • Healthcare professionals' skills • Involvement of relatives
182	Matthews, E.B., 2021, United States,[81]	Observational, questionnaire and interviews	Nonprobability sampling, n = 27	Depressive disorder	• Patient preference for involvement • Other • Patient-physician relationship • Contextual factors
183	Matthias, M.S., 2020, United States,[254]	Observational, interviews	Nonprobability sampling, n = 22	Chronic musculoskeletal pain	• Healthcare professionals' skills • Other
184	McNulty, M.C., 2022, United States,[280]	Observational, interviews and focus groups	Nonprobability sampling, Interviews n = 24 and focus groups n = 14	Transgender healthcare	• Patient-physician relationship • Involvement of relatives
185	Meier, S., 2021, United States, [100]	Observational, interviews	Nonprobability sampling, n = 38	Contraception	• Information • Patient-physician relationship
186	Mertz, K., 2018, United States, [291]	Observational, questionnaire	Nonprobability sampling, n = 117	Orthopedic	• Patient characteristics
187	Mertz, K., 2020, United States, [219]	Experimental, questionnaire	Nonprobability sampling, n = 96	Orthopedic	• Tools
188	Metz, M., 2018, the Netherlands,[220]	Experimental, questionnaire	Nonprobability sampling, n = 158	Mental health	• Tools
189	Milky, G., 2020, United States, [52]	Observational, questionnaire	Nonprobability sampling, n = 797	Diabetes mellitus	• Patient characteristics • Health conditions
190	Misra, A.J., 2019, United States,[86]	Observational, interviews	Nonprobability sampling, n = 22	Different	• Patient-physician relationship • Information • Other • Involvement of relatives
191	Moleman, M., 2021, the Netherlands,[82]	Observational, interviews	n = 15	Psychiatry and oncology	• Patient-physician relationship • Information • SDM process
192	Mortelmans, L., 2023, Belgium,[77]	Observational, interviews	Nonprobability sampling, n = 7	Oncology	• Patient-physician relationship • Health conditions • Information • Contextual factors
193	Mueck, K.M., 2018, United States,[241]	Observational, questionnaire and interviews	Nonprobability sampling, n = 30	Gallstones	• Patient characteristics • SDM process • Patient-physician relationship • Health conditions • Healthcare professionals' skills
194	Nakayama, K., 2020, Japan, [101]	Observational, questionnaire	Nonprobability sampling, n = 124	Prostate cancer	• Information
195	Nejati, B., 2019, Iran,[202]	Observational, questionnaire	Nonprobability sampling, n = 276	Multiple myeloma	• Patient characteristics • Other
196	Neumann, D., 2017, Germany, [42]	Observational, questionnaire	n = 767	Chronic kidney disease	• Other
197	Ngu, H., 2022, Singapore, [329]	Experimental, questionnaire	Nonprobability sampling, n = 60	Lower urinary tract	• Training for healthcare professionals • Tools
198	Nicolai, J., 2016, Germany, [199]	Observational, questionnaire	n = 71	Breast cancer and colon cancer	• Healthcare professionals' skills • Patient characteristics

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Table 4 (continued)

	First author, year of publication, country of origin, and citation number	Design and method (s) used to measure the degree of SDM experienced by patients	Type of sampling[a] and patient sample size (n) among whom the degree of SDM has been measured	Disease or healthcare setting	Categories of the empirically tested explanation (s) for the degree of SDM experienced by patients
					• Patient preference for involvement
199	Nijland, L.M.G., 2023, the Netherlands,[335]	Experimental, questionnaire	n – 238	Morbid obesity	• Tools
200	Niranjan, S.J., 2020, United States,[102]	Observational, interviews	Nonprobability sampling, n – 20	Breast cancer	• Information • Patient-physician relationship
201	Nishi, S.P.E., 2021, United States,[190]	Observational, questionnaire	Nonprobability sampling, n – 266	Lung cancer screening	• Patient characteristics • Health conditions
202	Nørgaard, B., 2022, Danish, [170]	Observational, questionnaire	Nonprobability sampling, n – 468	Diabetes type 2 or chronic obstructive pulmonary disease	• Patient characteristics • Health conditions
203	Noteboom, E.A., 2020, the Netherlands,[139]	Observational, questionnaire	Nonprobability sampling, n – 4763	Different cancers	• Tools • Involvement of another healthcare professional
204	Noteboom, E.A., 2020, the Netherlands,[138]	Observational, interviews and questionnaire	Nonprobability sampling, Interviews n – 9 and questionnaires n – 12	Metastatic lung or gastro-intestinal cancer	• Tools • Involvement of another healthcare professional
205	Nott, J. 2018, Scotland,[167]	Observational, questionnaire	Nonprobability sampling, n – 109	Psychiatric diagnosis	• Contextual factors • Health conditions
206	Noyes, J., 2021, United Kingdom,[103]	Observational, interviews	Nonprobability sampling, n – 37	Chronic kidney disease	• Information • Other
207	Nuwagaba, J., 2021, Uganda, [272]	Observational, questionnaire	Nonprobability sampling, n – 326	Different	• Patient-physician relationship
208	Okunrintemi, V., 2021, United States,[53]	Observational, questionnaire	Nonprobability sampling, n – 16218	Atherosclerotic cardiovascular disease	• Patient characteristics • Contextual factors
209	Ommen, O., 2011, Germany, [182]	Observational, questionnaire	Nonprobability sampling, n – 2197	Different	• Patient characteristics • Information • Healthcare professionals' skills
210	Ousseine, Y.M., 2019, France, [200]	Observational, questionnaire	Nonprobability sampling, n – 2299	Cancer	• Patient characteristics
211	Padilla-Garrido, N., 2017, Spain,[237]	Observational, questionnaire	Probability sampling, n – 118	Cancer	• Patient preference for involvement
212	Paredes, A.Z., 2018, United States,[232]	Observational, questionnaire	Nonprobability sampling, n – 6989	Different	• Patient characteristics
213	Peek, M.E., 2014, United States,[168]	Observational, questionnaire	n – 273	Hypertension	• Health conditions • Patient characteristics
214	Peek, M.E., 2013, United States,[279]	Observational, focus groups and interviews	Nonprobability sampling, focus groups n – 27 and interviews n – 24	Diabetes	• Patient-physician relationship
215	Peek, M.E., 2010, United States,[36]	Observational, focus groups and interviews	Nonprobability sampling, focus groups n – 27 and interviews n – 24	Diabetes	• Patient characteristics • Healthcare professional characteristics • Other
216	Peek, M.E., 2009, United States,[39]	Observational, focus groups and interviews	Nonprobability sampling, focus groups n – 27 and interviews n – 24	Diabetes	• Patient-physician relationship • Patient characteristics • Healthcare professional characteristics • Other
217	Peña, A., 2019, United States, [292]	Experimental, questionnaire	Nonprobability sampling, n – 314	Prostate cancer	• Tools
218	Perfors, I.A.A., 2020, the Netherlands,[136]	Experimental, questionnaire	Nonprobability sampling, n – 154	Breast, lung, colorectal, gynecologic cancer, and melanoma	• Involvement of another healthcare professional
219	Pii, K.H., 2020, Denmark, [246]	Observational, interviews	Nonprobability sampling, n – 12	Stress, depression, anxiety	• Patient-physician relationship • Healthcare professionals' skills • Patient characteristics • Other
220	Politi, M.C., 2020, United States,[293]	Experimental, questionnaire	Nonprobability sampling, n – 120	Breast cancer	• Tools
221	Poon, B. Y., 2019, United States,[41]	Observational, questionnaire	n – 1222	Diabetes and/or cardiovascular disease	• Other
222	Price-Haywood, E.G., 2014, United States,[264]	Experimental, questionnaire	Nonprobability sampling, n – 168	Colorectal, breast or cervical cancer screening	• Training for healthcare professionals
223	Quaschning, K., 2013, Germany,[45]	Observational, questionnaire	Nonprobability sampling, n – 402	Rehabilitation	• Other • Healthcare professionals' skills
224	Rahimian Bogaar, L., 2013, Iran,[33]	Observational, questionnaire	Nonprobability sampling, n – 500	Diabetes type 2	• Contextual factors • Patient characteristics • Other

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Table 4 continued)

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225	Rao, B.R., 2022, United States, [112]	Observational, interviews	Nonprobability sampling, n = 20	Implantable cardioverter-defibrillators	• Patient-physician relationship • Involvement of relatives • Health conditions • Tools • Information • Healthcare professionals' skills
226	Rao, B.R., 2021, United States, [316]	Experimental, questionnaire	Nonprobability sampling, n = 101	Implantable cardioverter-defibrillators	• Tools
227	Raphael, D.B., 2021, the Netherlands,[309]	Experimental, questionnaire	Nonprobability sampling, n = 403	Breast cancer	• Tools
228	Ravaldi, C., 2023, Italy,[43]	Observational, questionnaire	Nonprobability sampling, n = 187	Stillbirth	• Other
229	Renberg, E.F., 2019, Sweden, [294]	Experimental, questionnaire	Nonprobability sampling, n = 65	Psychiatric disorders	• Tools
230	Rencz, F., 2020, Hungary, [178]	Observational, questionnaire	Probability sampling, n = 424	Different	• Contextual factors • Patient characteristics • Health conditions
231	Riggan, K.A., 2021, United States,[248]	Observational, interviews	Nonprobability sampling, n = 47	Uterine fibroids	• Healthcare professionals' skills • Information
232	Robinski, M., 2016, Germany, [159]	Observational, questionnaire	n = 780	Peritoneal dialysis and hemodialysis	• Health conditions
233	Robinski, M., 2017, Germany, [160]	Observational, questionnaire	n = 780	Peritoneal dialysis and hemodialysis	• Health conditions • Patient characteristics
234	Rodriguez, K.L. 2008, United States,[179]	Observational, questionnaire	Nonprobability sampling, n = 90	Hearth failure	• Patient characteristics • Patient preference for involvement
235	Rose, A., 2018, United Kingdom,[104]	Observational, questionnaire and interviews	Nonprobability sampling, questionnaire n = 40 and interviews n = 15	Frailty syndromes	• Patient characteristics • Healthcare professionals' skills • SDM process • Other
236	Saleeb, M., 2023, Canada, [338]	Observational, questionnaire	Nonprobability sampling, questionnaire n = 146	Hysterectomy	• Health conditions • Patient characteristics
237	Santema, T.B., 2017, the Netherlands,[59]	Observational, questionnaire and interviews	Nonprobability sampling, questionnaire n = 67 and interviews n = 17	Abdominal aortic aneurysm and imperil arterial occlusive disease	• Information • Patient-physician relationship • SDM process • Contextual factors • Healthcare professionals' skills
238	Santema, T.B., 2016, the Netherlands,[247]	Observational, questionnaire	Nonprobability sampling, n = 54	Vascular surgery	• Healthcare professionals' skills
239	Savelberg, W., 2020, the Netherlands,[19]	Observational, interviews	Nonprobability sampling, n = 20	Breast cancer	• Information • Involvement of relatives • Involvement of another healthcare professional • Healthcare professionals' skills • Tools
240	Scalia, P., 2018, Poland,[180]	Experimental, questionnaire	Nonprobability sampling, n = 3937	Different	• Patient characteristics • Healthcare professionals' skills • Tools
241	Scheffer, M., 2022, the Netherlands,[76]	Observational, interviews	Nonprobability sampling, n = 20	Age-related macular degeneration	• Information • Healthcare professionals' skills • Contextual factors
242	Schellartz, I., 2021, Germany, [105]	Observational, questionnaire	n = 964	Hemodialyses	• Information
243	Scholl, I., 2021, Germany, [222]	Experimental, questionnaire	n = 2128	Suspected diagnosis of a neoplasm	• Training for healthcare professionals • Tools
244	Schott, S.L., 2021, United Kingdom,[317]	Experimental, questionnaire	n = 66	Artial fibrillation	• Tools
245	Selman, L.E., 2021, United Kingdom,[73]	Observational, interviews	Nonprobability sampling, n = 16	Lower urinary tract symptoms	• Patient characteristics • Contextual factors • Healthcare professionals' skills
246	Sepucha, K., 2017, United States,[212]	Experimental, questionnaire	Nonprobability sampling, n = 649	Orthopaedic	• Tools

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Table 4 (continued)

	First author, year of publication, country of origin, and citation number	Design and method (s) used to measure the degree of SDM experienced by patients	Type of sampling[a] and patient sample size (n) among whom the degree of SDM has been measured	Disease or healthcare setting	Categories of the empirically tested explanation (s) for the degree of SDM experienced by patients
247	Sepucha, K., 2022, United States,[268]	Experimental, questionnaire	Nonprobability sampling, n = 466	Colorectal cancer	• Training for healthcare professionals
248	Sepucha, K.R., 2023, United States,[224]	Experimental, questionnaire	Nonprobability sampling, n = 800	Colorectal cancer screening	• Tools
249	Sferra, S.R., 2020, United States,[325]	Experimental, questionnaire	n = 209	Lung cancer screening	• Tools
250	Shen, H.N., 2019, Taiwan, [161]	Observational, questionnaire	Nonprobability sampling, n = 511	Breast cancer	• Patient characteristics • Health conditions
251	Siegel, C.A., 2016, United States,[203]	Observational, questionnaire	n = 355	Inflammatory bowel disease	• Information
252	Snowden, A., 2023, United Kingdom,[337]	Experimental, questionnaire	Nonprobability sampling, n = 147	Cancer	• Tools
253	Solberg, L.I., 2014, United States,[162]	Observational, questionnaire	n = 1168	Depression	• Patient characteristics • Contextual factors • Health conditions • Other
254	Spierings, J., 2020, the Netherlands,[21]	Observational, questionnaire and interviews	Nonprobability sampling, n = 25	Diffuse cutaneous systemic sclerosis	• Information • Patient-physician relationship • Involvement of relatives
255	Spies, C.D., 2006, Germany, [163]	Observational, questionnaire	Nonprobability sampling, n = 241	Chronic pain disease and premedication	• Health conditions • Contextual factors
256	Spinnewijn, L., 2021, the Netherlands,[295]	Observational, questionnaire	Nonprobability sampling, n = 399	Obstetrics and gynecology	• Training for healthcare professionals
257	Stolz-Klingenberg C, 2023, Germany,[228]	Experimental, questionnaire	Nonprobability sampling, n = 261	Neurology	• Training for healthcare professionals • Tools
258	Stubenrouch, F.E., 2017, the Netherlands,[296]	Observational, questionnaire	Nonprobability sampling, n = 80	Patients should require surgery in the arms, lower abdomen, or legs, for which three anesthesia techniques were feasible	• Contextual factors • Patient characteristics • Healthcare professional characteristics
259	Sumpton, D., 2021, Australia, [106]	Observational, interviews	Nonprobability sampling, n = 25	Psoriatic arthritis	• Patient-physician relationship • Information • Other
260	Tai-Seale, M., 2016, United States,[266]	Experimental, questionnaire	n = 300	Different	• Training for healthcare professionals
261	Takaesu, Y., 2022, Japan, [269]	Experimental, questionnaire	Nonprobability sampling, n = 124	Depression	• Training for healthcare professionals
262	Tamirisa, N.P., 2017, United States,[107]	Observational, interviews	Nonprobability sampling, n = 20	Breast cancer, pancreatic cancer, cervical cancer, endometrial cancer, and melanoma	• Information • Patient preference for involvement • Healthcare professionals' skills • Other
263	Thera, R., 2018, Canada,[130]	Observational, interviews	Nonprobability sampling, n = 11	Prostate cancer	• Health conditions • Involvement of another healthcare professional • Involvement of relatives
264	Thevelin, S., 2022, the Netherlands, Ireland, Belgium and Switzerland,[127]	Observational, interviews	Nonprobability sampling, n = 48	older people with multimorbidity	• Involvement of relatives • Patient characteristics • Patient-physician relationship • Healthcare professionals' skills • Contextual factors
265	Thirukumar, P., 2021, Germany,[78]	Observational, interviews	Nonprobability sampling, n = 33	Cesarean birth	• Healthcare professionals' skills • Information • Contextual factors
266	Tilburgs, B., 2020, the Netherlands,[307]	Experimental, questionnaire	Nonprobability sampling, n = 129	Dementia	• Training for healthcare professionals
267	Tinetti, M.E., 2019, United States,[297]	Experimental, questionnaire	n = 366	Different	• Training for patients • Training for healthcare professionals
268	Tinsel, I., 2013, Germany, [303]	Experimental, questionnaire	n = 1120	Hypertension and/or with relevant comorbidity	• Training for healthcare professionals
269	Truglio-Londrigan, M., 2015, United States,[258]	Observational, interviews	Nonprobability sampling, n = 6	Different	• Healthcare professionals' skills • Information • SDM process
270	Tsuboi, H., 2022, Japan,[171]	Observational, questionnaire	Nonprobability sampling, n = 217	Rheumatoid arthritis	• Health conditions

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Table 4 (continued)

	First author, year of publication, country of origin, and citation number	Design and method (s) used to measure the degree of SDM experienced by patients	Type of sampling[a] and patient sample size (n) among whom the degree of SDM has been measured	Disease or healthcare setting	Categories of the empirically tested explanation (s) for the degree of SDM experienced by patients
271	Tubb, M.R., 2019, United States,[298]	Experimental, questionnaire	Nonprobability sampling, n = 73	Smoking cessation	• Tools
272	Vaidya, T.S., 2021, United States,[213]	Observational, questionnaire	Nonprobability sampling, n = 30	Melanoma	• Tools • Patient characteristics • Health conditions
273	Valentine, K.D. 2021, United States,[164]	Observational, questionnaire	n = 646	Elective hip and knee replacement and spine surgery	• Health conditions • Contextual factors
274	Van der Kraaij, G.E., 2020, the Netherlands,[20]	Observational, questionnaire	n = 312	Atopic dermatitis or psoriasis	• Contextual factors • Other • Information
275	Van der Krieke, L., 2013, the Netherlands,[310]	Experimental, questionnaire	n = 73	Nonaffective psychosis (brief psychotic disorder, schizophreniform disorder, schizoaffective disorder, schizophrenia, or psychotic disorder not otherwise specified)	• Tools
276	Van der Wijden, F.C., 2019, the Netherlands,[205]	Experimental, questionnaire	n = 217	Prostatic hyperplasia	• Tools
277	Van Dulmen, S., 2022, the Netherlands,[117]	Observational, interviews	Nonprobability sampling, n = 14	Nephrology	• Patient characteristics • Information • Healthcare professionals' skills
278	Van Esch, T.E.M., 2018, the Netherlands,[299]	Observational, questionnaire	n = 1199	Antibiotic prescribing	• Patient characteristics
279	Van Huizen, A.M., 2023, the Netherlands,[336]	Experimental, questionnaire	n = 30	Psoriasis	• Tools
280	Van Rossenberg, L.X., 2021, the Netherlands,[187]	Observational, questionnaire	Nonprobability sampling, n = 63	Hand surgery	• Patient characteristics
281	Van Veenendaal, H., 2022, the Netherlands,[267]	Experimental, questionnaire	n = 74	Breast cancer	• Training for healthcare professionals
282	Van Veenendaal, H., 2020, the Netherlands,[306]	Experimental, questionnaire	Nonprobability sampling, n = 105	Breast cancer	• Training for healthcare professionals
283	Vedasto, O., 2021, Tanzania, [74]	Observational, interviews	Nonprobability sampling, n = 7	Diabetic	• Information • Patient preference for involvement • Contextual factors
284	Veilleux, S., 2018, Canada, [108]	Observational, questionnaire	n = 200	Inflammatory bowel disease	• Information
285	Venkatesh, K.K., 2021, United States,[318]	Experimental, questionnaire	Nonprobability sampling, n = 100	Cesearan delivery	• Tools
286	Verberne, W.R., 2019, the Netherlands,[89]	Observational, questionnaire	n = 99	Chronic kidney disease	• SDM process • Involvement of another healthcare professional • Involvement of relatives • Information
287	Verwijmeren, D., 2018, the Netherlands,[37]	Observational, questionnaire	n = 81	Bipolar disorder I, II or 'not otherwise specified'	• Health conditions • Other • Contextual factors • Patient characteristics
288	Vodemaier, A., 2009, Germany,[319]	Experimental, questionnaire	n = 111	Breast cancer	• Tools
289	Wang, M.J., 2019, Taiwan, [75]	Observational, questionnaire	Nonprobability sampling, n = 372	Diabetes type 2	• Contextual factors • Healthcare professionals' skills • Health conditions • Patient characteristics
290	Wang, Y., 2022, China,[172]	Observational, questionnaire	n = 290	Lung cancer	• Health conditions • Patient characteristics
291	Wesseldijk-Elferink, L.J.M., 2021, the Netherlands,[273]	Observational, interviews	Nonprobability sampling, n = 7	Schizoaffective disorder	• Healthcare professionals' skills • Other • Patient-physician relationship
292	Whitney, R.L., 2021, United States,[275]	Observational, interviews	Nonprobability sampling, n = 19	Multiple myeloma	• Patient-physician relationship
293	Wiley, J., 2014, Australia, [124]	Observational, focus groups and questionnaires	Focus groups n = 33 and questionnaire n = 150	Diabetes type 1	• Healthcare professionals' skills • Other • Contextual factors • Information
294	Wilkes, M.S., 2013, United States,[320]	Experimental, questionnaire	n = 712	Prostate cancer screening	• Tools
295	Wilkins, E.G., 2006, United States,[321]	Experimental, questionnaire	n = 101	Breast cancer	• Tools

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Table 4 (continued)

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296	Williams, D., 2023, United Kingdom, Ireland, New Zealand, Australia, Canada, United States,[40]	Observational, questionnaires and interviews	Nonprobability sampling, questionnaires n = 182 and interviews n = 21	Cystic Fibrosis	• Healthcare professionals' skills • Patient characteristics • Information
297	Wollny, A., 2021, Germany, [257]	Experimental, questionnaire	n = 833	Diabetes type 2	• Training for healthcare professionals • Healthcare professionals' skills
298	Woltz, S., 2017, the Netherlands,[300]	Observational, questionnaire	n = 50	Displaced midshaft clavicular fracture	• Patient characteristics • Contextual factors • Other
299	Wrzal, P.K., 2022, Canada, [186]	Observational, questionnaire	Nonprobability sampling, n = 300	Diabetes type 2	• Patient characteristics
300	Xiao, L., 2022, China,[165]	Observational, questionnaire	Nonprobability sampling, n = 458	Different cancers	• Patient characteristics • Health conditions
301	Yang, Y., 2022, China,[185]	Observational, questionnaire	Probability sampling, n = 164	Different cancers	• Patient characteristics
302	Yee, D., 2023, United States, [44]	Observational, questionnaire	Nonprobability sampling, n = 3715027	Psoriasis	• Patient characteristics • Health conditions • Other
303	Yen, R.W., 2020, United States,[301]	Experimental, questionnaire	n = 311	Breast cancer	• Tools • Patient characteristics
304	Yu, C.H., 2019, Canada,[276]	Observational, interviews	n = 7	Diabetes type 1 and 2	• Patient-physician relationship
305	Ziebland, S., 2014, United Kingdom,[87]	Observational, interviews	Nonprobability sampling, n = 32	Pancreatic cancer	• SDM process • Information • Involvement of relatives • Healthcare professionals' skills
306	Zisman-Ilani, Y., 2023, United States,[118]	Observational, interviews and questionnaire	n = 32	Diabetes type 2	• Information • Involvement of relatives • Healthcare professionals' skills • Patient-physician relationship
307	Zisman-Ilani, Y., 2019, Israel, [265]	Experimental, questionnaire	Nonprobability sampling, n = 101	Schizophrenia and related disorders, and mood disorders	• Training for healthcare professionals • Tools
308	Zoffmann, V., 2008, Denmark, [255]	Observational, interviews	n = 11	Diabetes type 2	• Healthcare professionals' skills • Contextual factors • Other

[a] For some studies it was not possible to infer how the sample was drawn. Therefore, not for all studies the way of sampling is mentioned.
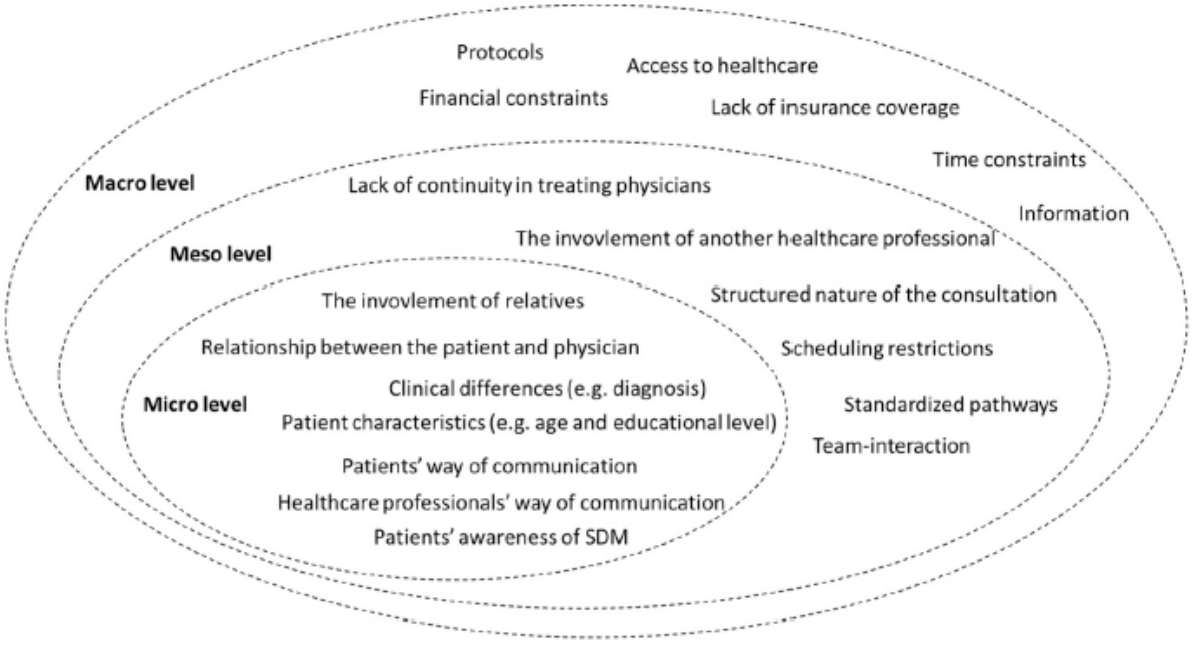
Figure 2 The macro, meso, and micro level, and related key explanations for the degree of SDM experienced by patients.