



Impact of shared decision making on healthcare in recent literature: a scoping review using a novel taxonomy

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Abstract

Background Numerous articles and reviews discussed the effects of shared decision making (SDM) on concept-specific and direct outcomes, showing great variety in methodology and results.

Objectives This scoping review accentuates effects of shared decision making interventions on more distal and distant outcomes related to the healthcare experience of patients and physicians, the economy and treatment parameters.

Eligibility criteria The search considered randomized controlled trials (RCTs), their secondary analyses and follow-up reports comparing shared decision making interventions against control conditions.

Sources of evidence MEDLINE (through PubMed) and reference lists of included articles were systematically appraised.

Charting methods First, relevant outcome effects were extracted following the authors' conclusions. Second, all outcomes were sorted into one of five different effect levels: individual, interactional, organizational, systemic and clinical.

Results The search process identified 120 eligible reports, representing 116 randomized controlled trials and four follow-up reports with a variety in research topics, intervention types, outcome measurements and effects.

Most of the 296 extracted outcomes were reported as not affected by shared decision making (205). While some outcomes improved at least slightly (81), few tended to decline (7) or revealed mixed results (3).

Considering the five outcome effect levels, individual and clinical outcomes were reported more frequently than interactional, organizational and systemic ones. However, many individual outcomes could be counted as systemic and vice versa.

Conclusions Shared decision making can improve distal and distant outcomes depending on the healthcare context. Individual, systemic and clinical outcomes have been more frequently appraised than interactional and organizational ones. Single database search and limited assessment of articles' risk of bias and effect size narrow reliability of our results.

Plain language summary Shared decision making depicts the idea of patients and doctors collaboratively finding the treatment that fits the patient most. While numerous former studies looked at what shared decision making does to the decision making process itself and other decision related outcomes, this article looks at more distal and distant outcomes – such as how patients, physicians, the economy and treatment are affected. It does so by systematically searching the online database PubMed and article's citation lists. Our results reveal most distal and distant outcomes were either not or rather positively affected by shared decision making while few declined. Consequently, this article states shared decision making can be implemented in healthcare with a good chance of improving distal and distant outcomes.

Sorting all outcomes into five different effect levels – individual, interactional, organizational, systemic and clinical – reveals outcomes on individual and clinical levels being more frequently appraised than interactional and organizational ones. For future studies, we suggest keeping these effect levels in mind and shifting focus towards outcomes on interactional and organizational level – like how shared decision making affects the patient–physician-relationship or healthcare teams' collaboration.

Extended author information available on the last page of the article

Keywords Shared decision making · Patient participation · Clinical outcomes · Effect levels

Introduction

Rationale

Shared decision making (SDM) depicts the idea of mutual collaboration between patients and physicians when finding the most suitable treatment. This process involves patients stating their preferences and needs, physicians offering expertise and experience, provision of evidence-based information on benefits and risks of available treatment options and the decision upon subsequent treatment steps (Charles et al. 1997).

On one hand, numerous trials and reviews tackled the effects of SDM on proximal, concept-specific outcomes (Clayman et al. 2016; Martínez-González et al. 2018; Yu et al. 2021) and they are, without doubt, an important goal in healthcare. However, on the other hand, there is criticism that SDM interventions should not only enhance SDM-specific outcomes such as communication and the decision process (Shay and Lafata 2015), but also concept-distal and distant healthcare outcomes. Based on Elwyn's taxonomy for possible SDM effects (Elwyn et al. 2016), this scoping review hopes to close the gap in distal and distant outcomes to inform clinicians and SDM implementers.

Objectives

First, this review appraises distal and distant outcomes in recent SDM interventions related to patients' and healthcare providers' experience of healthcare, the economy and treatment parameters.

Second, it groups all outcomes into one of five different effect levels to demonstrate patterns and potentials in outcome choice for future interventions.

Material and methods

Protocol and registration

All investigators followed a protocol (Supplementary Material 1) that was not – as the review itself – registered beforehand. The review was conducted and reported following the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist that is depicted in Supplementary Material 5 (Tricco et al. 2018).

Information sources, search and eligibility criteria

The search strategy comprised MEDLINE (through PubMed) and reference lists of included articles.

On one side, search terms were copied from Clayman's systematic review (Clayman et al. 2016) that considered more general concepts. On the other side, our team created search terms based on patients' and physicians' healthcare experience, the economy and treatment parameters (Supplementary Material 2).

The PubMed search limitations were as follows:

Publication year: 2015–2023

Article type: Randomized controlled trials (RCTs), systematic reviews (SRs)

Species: Humans

Publication language: English, German

The final search in MEDLINE (through PubMed) happened on 2 March 2023, complemented by handsearching reference lists of identified randomized controlled trials (RCTs) and systematic reviews (SRs). We deliberately considered systematic reviews for the search process to frisk their reference lists for additional sources – yet excluded them from data extraction.

Considering Clayman's (Clayman et al. 2016) and Elwyn's (Elwyn et al. 2016) articles as fundamental for this review, 'recent' literature is defined as from 2015 onwards. Furthermore, we believe the focus in research before 2015 was less focused on broad scale implementation of complex SDM interventions and some interventions were still in the development phase with distal and distant outcomes less frequently noted.

Selection of sources of evidence

Following the PICO framework (Fig. 1), we considered RCTs besides their follow-up reports and secondary analyses comparing interventions that promote shared decision making between patients and healthcare providers against control groups. Those interventions could be decision aids, decision coaching programmes, training in shared decision making for healthcare providers or patients and multimodal or complex shared decision making interventions. We excluded all interventions that either contained an additional component besides SDM (for instance a new drug) or no SDM at all – such as simple information leaflets or other communication interventions (Table 1).

Two authors (FW and MaDe) independently screened all titles, abstracts and full texts without automation tools. When in doubt, they contacted a third author (FS).

PICO framework
Population: Patients facing healthcare decisions
Interventions: promoting shared decision making – decision aids, SDM training for healthcare providers and patients, decision coaching
Comparison: Patients receiving no aspects of shared decision making
Outcomes: related to the healthcare experience of patients and healthcare providers, the economy and treatment parameters

Fig. 1 PICO framework

Data charting process and data items

The same two authors (FW and MaDe) extracted relevant data from selected studies without automation tools using predefined forms: first author, publication year, country, study population size, type of SDM intervention and control group, outcome operationalization and outcome effects following the articles' conclusions.

If the number of randomized patients was not explicitly stated, we chose the number of included participants or combined the intervention and control group numbers by simple addition.

The extraction process considered all primary and secondary outcomes relevant to the healthcare experience of patients and physicians, economic and treatment parameters. Furthermore, each outcome operationalization was stated – questionnaire, surgery rates, etc. – deliberately excluding outcomes specific for shared decision making, the decision making process, communication and the evaluation of interventions.

To indicate outcome effects, we critically appraised the articles' conclusions and extracted the direction of effect and whether it was reported as statistically significant:

- ↑ Statistically significant improvement
- (↑) Trend towards improvement
- ↑/∅ Between improvement and no effect
- ∅ No effect
- ↓/∅ Between decline and no effect
- (↓) Trend towards decline
- ↓ Statistically significant decline
- Mixed results

Looking at the terms 'improvement' and 'decline', an increased therapy adherence, screening uptake or reduced resource use represent an improvement, less treatment satisfaction or increased costs a decrease (Supplementary Material 4).

Critical appraisal of individual sources of evidence

Only randomized controlled trials aside their secondary analyses and follow-up reports were included. Owing to the heterogeneity in interventions, outcome operationalization and measurement timepoints, this review uses qualitative instead of quantitative synthesis. We neither verified the reported effect size nor its statistical significance in the body of the text or in the included graphs or tables.

Table 1 In- and excluded shared decision making interventions

Included interventions	
SDM training for healthcare providers and patients Role play sessions, teaching in SDM concepts, perspective, collaboration, videos, feedback Patient engagement, education, encouragement to ask questions, empowerment and activation, explanation of therapy options, self-efficacy, consolidation, collaboration	Decision coaching Supporting patients, evaluating patient's goals and needs, inform patients about treatment options, using motivational interviewing and collaborative goal setting
Decision aids Web and printed format, informational and interactive style for patients, physicians or both before or after consultation	Interventions aiming to give patients a more active role during consultation Question prompt lists for patient activation, structured consultations
Excluded non-SDM interventions Motivational interviewing alone, simple surveys or question prompt lists	

Synthesis of results

First, similar outcome measurements – such as LDL-cholesterol and creatinine as biological markers – were summarized into groups for clarity (Supplementary Material 4).

Second, all extracted outcomes were sorted into one of five predefined effect levels following Elwyn's idea about four possible levels (Elwyn et al. 2016) – individual, interactional, organizational and systemic – adding the clinical level ourselves as the fifth. Each outcome effect was considered for only one level to maintain clarity and avoid redundancy:

- **Individual level:** related to individual aspects of patients and healthcare providers.
- **Interactional level:** related to the interaction between patients and healthcare providers.
- **Organizational level:** related to organizational structures such as medical wards, treatment teams or hospitals.
- **Systemic (healthcare system) level:** related to healthcare systems and healthcare distribution in general.
- **Clinical level:** related to effect and safety of medical treatments.

Results

Selection of sources of evidence

The search flow diagram following the PRISMA Statement can be found in Fig. 2 (Page et al. 2021). After removing 274 duplicates, the combined search terms resulted in 1471 records. Further removing 1056 of them after title and abstract screening, 415 records were appraised in full text. Of those, 115 records were considered relevant. Splitting them up, four were follow-up reports/secondary analyses (Dehlendorf et al. 2019b; Green et al. 2020; Trenaman et al. 2017, 2020) and 111 randomized controlled trials (Adekpedjou et al. 2020; Agarwal et al. 2018; Alegria et al. 2018; Aljumah and Hassali 2015; Allen et al. 2018; Aoki et al. 2019; Bergeron et al. 2019; Betz et al. 2020; Beulen et al. 2016; Bouleuc et al. 2021; Boulware et al. 2018; Bourmaud et al. 2016; Buhse et al. 2015, 2018; Chabrera et al. 2015; Chen et al. 2021; Chong et al. 2021; Cox et al. 2019; Crew et al. 2022; Dehlendorf et al. 2019a; Dempsey et al. 2018; Den Ouden et al. 2017; Drost et al. 2023; Dwinger et al. 2020; Eggly et al. 2017; El Miedany et al. 2019; Epstein et al. 2017; Fang et al. 2021; Ferron et al. 2015; Fisher et al. 2020; Gabel et al. 2020; Gagné et al. 2017; George et al. 2021; Green et al. 2015; Greenberg et al. 2020; Hamann et al. 2017, 2020; Hanson et al. 2017; Härter et al. 2015, 2016; Henselmans et al. 2020; Hess et al. 2018; Heyland et al. 2020; Hoffman et al. 2017, 2022; Ibrahim et al. 2017; Jayadevappa et al. 2019; Jayakumar et al. 2021; Kang et al. 2020; Karagianis et al. 2016; Kask-Flight et al. 2021; Kobewka et al. 2021;

Korteland et al. 2017; Kostick et al. 2018; Kunneman et al. 2020, 2022; Kuppermann et al. 2020; Lamers et al. 2021; LeBlanc et al. 2015a, b; Lewis et al. 2018; Lin et al. 2020; Lovell et al. 2018; Ludden et al. 2019; Manne et al. 2016; McBride et al. 2016; McGrath et al. 2017; Meade et al. 2015; Metcalfe et al. 2017; Minneci et al. 2019; Moin et al. 2019; Noseworthy et al. 2022; Omaki et al. 2021; O'Malley et al. 2022; Osaka and Nakayama 2017; Parkinson et al. 2018; Patzer et al. 2018; Perestelo-Pérez et al. 2016; Politi et al. 2020a, b; Probst et al. 2020; Rahn et al. 2018; Reder and Kolip 2017; Roberto et al. 2020; Rothwell et al. 2019; Saunier et al. 2020; Schonberg et al. 2020; Schott et al. 2021; Schubart et al. 2019; Sepucha et al. 2023; Singh et al. 2019; Smallwood et al. 2017; Spijk-de Jonge et al. 2022; Stacey et al. 2016; Stamm et al. 2017; Stegmann et al. 2020; Stubenrouch et al. 2022; Tilburgs et al. 2020; Vigod et al. 2019; Vo et al. 2019; Volk et al. 2020; Walczak et al. 2017; Wang et al. 2023; Warner et al. 2015; Watts et al. 2015; Wilkens et al. 2019; Wise et al. 2019; Wollny et al. 2019; Wyld et al. 2021; Yun et al. 2019; Zisman-Ilani et al. 2023).

In addition, five RCTs were identified through citation searching (AISagheir et al. 2020; Hess et al. 2016; Luan et al. 2016; Malhotra et al. 2020; Pérez-Lacasta et al. 2019). This resulted in a total of 120 included reports. Systematic reviews were excluded from data extraction, but their reference lists screened for evidence.

In a wide variety of research topics, screening, cancer and chronic conditions such as diabetes were the most frequent ones. Most interventions in the 116 randomized controlled trials included decision aids (110) followed by training in shared decision making for healthcare providers (22) or patients (6) and decision coaching (15). The remaining interventions (15) were either special SDM consultation sessions, treatment priority forms, activation cards, worksheets or reports of patients' preferences to the treating physician. Numerous studies combined several of these interventions.

Characteristics of sources of evidence and results of individual sources of evidence

See Supplementary Material 3 for data extraction results.

Critical appraisal within sources of evidence

Only randomized controlled trials, their follow-up reports and secondary analyses were considered and the authors' conclusions appraised.

Synthesis of results

Outcome effects

All in- and excluded outcomes can be found in Supplementary Material 4.

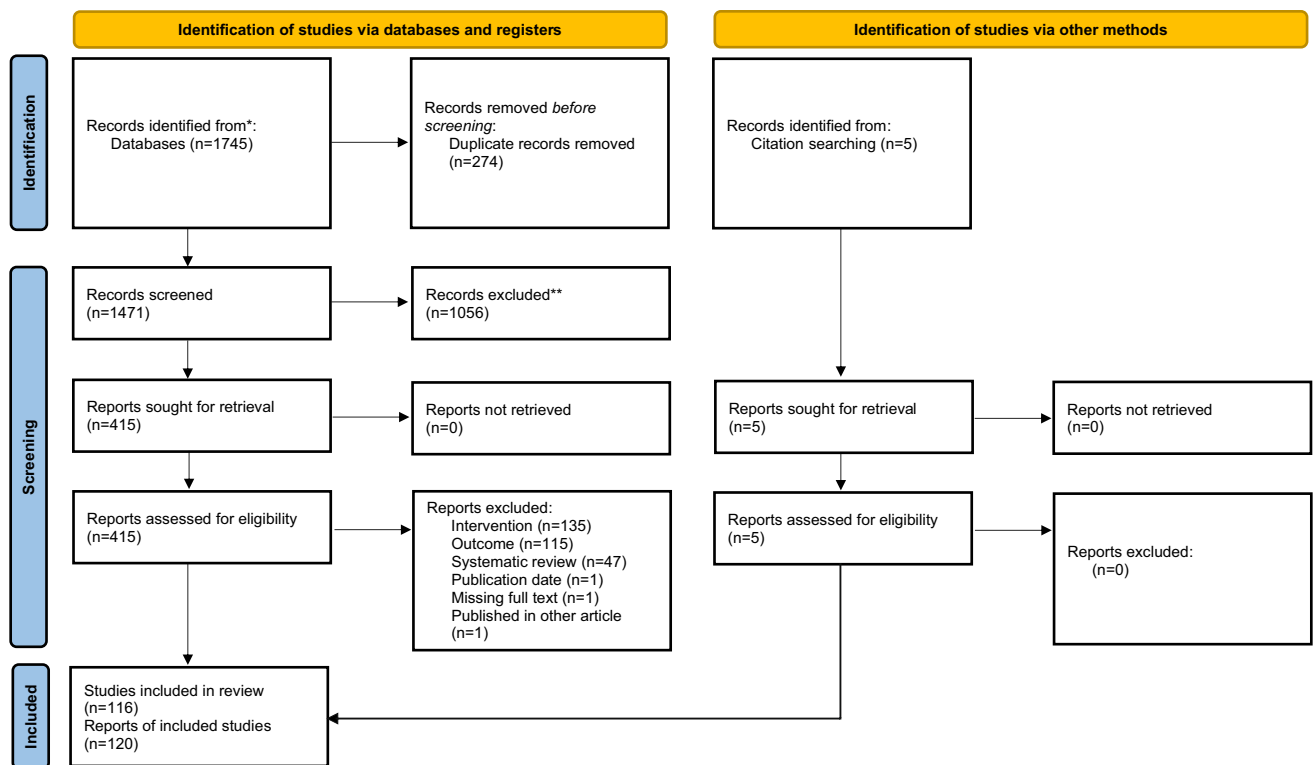


Fig. 2 Search flow diagram

We extracted 296 outcome effects and sorted them into 20 different groups.

Of 296 outcome effects, 81 placed between positive trend and statistically significant positive effect, 205 had no effect, 7 a negative trend or statistically significant negative effect and 3 mixed results (Table 2).

Effect levels

Applying the five different effect levels revealed individual (111) and clinical (111) outcome effects being more frequently appraised than interactional (37), systemic (33) and organizational (4) ones (Table 2). It must be noted that numerous individual outcomes could have also been interpreted as systemic outcomes – like patients' final screening choice represents a form of resource utilization (systemic) apart from the patient's decision (individual).

Discussion

Summary

This scoping review synthesized 116 randomized controlled trials and four follow-up reports/secondary

analyses published between January 2015 and March 2023 comparing SDM interventions against control groups. It demonstrates that most distal and distant outcomes related to patients' and healthcare providers' healthcare experience, the economy and treatment parameters are either not affected or affected positively by SDM. Most outcomes relate to individual, systemic or clinical levels – interactional and organizational outcomes have been less frequently evaluated.

Our results for outcome effects are in line with other broad reviews. For instance, Stacey et al. demonstrated no to moderate positive effects on various outcomes in a Cochrane meta-analysis of patient decision aids in 2017 (Stacey et al. 2017).

Looking at possible criticism, Shay et al. stated missing evidence for healthcare outcomes in their systematic review in 2015 (Shay and Lafata 2015) – which we cannot confirm after seven additional years of research.

Finally, when sorting our review into the existing evidence, this is the first attempt to group outcomes on different effect levels to inform future SDM interventions regarding outcome choice. We can confirm, the existing literature about shared decision making interventions seems muddled at times with a great variety in research topics, methodology and results.

Table 2 Extraction results

Extraction results (296 outcome effects)	Individual 111	Interactional 37	Organizational 4	Systemic 33	Clinical 111
↑ Improvement, statistically significant	28	8	1	7	10
(↑) Improvement, not statistically significant or positive trend	2	0	0	3	4
↑/⊖ Results between improvement and no effect	9	0	0	4	5
⊖ No effect	68	27	2	16	92
↓/⊖ Mixed results between worsening and no effect	1	0	0	0	0
(↓) Worsening, not statistically significant or negative trend	0	0	1	1	0
↓ Worsening, statistically significant	1	2	0	1	0
Mixed results	2	0	0	1	0

Strengths

Strengths of this article are the quantity and broad spectrum of included studies. Furthermore, all included studies are RCTs, increasing the likelihood of reliable data on outcome effects.

Additionally, this scoping review offers a new way of sorting outcome effects on five predefined effect levels following Elwyn's taxonomy (Elwyn et al. 2016).

Limitations

First, a single database search and missing further appraisal of articles' quality of evidence (risk of bias etc.) suggest cautious interpretation. However, all studies in this review are RCTs that mostly adhered to the CONSORT criteria and an exact estimate of the magnitude and possible bias of these effects was not intended in our review.

Second, numerous outcomes fit into more than one level – for example, patients' final screening choice on one hand can be interpreted as individual, on the other hand as systemic. Moreover, sorting mutual outcomes into groups likewise affected the results. For the comprehensive overview in this article, both strategies were necessary and eligible. Our strategy likely reduced the total number of extracted outcomes without changing the general direction in results.

Third, we did not look at proximal effects of SDM interventions. Reasons for declining distal and distant outcome effects might be that SDM does not affect them – or the SDM intervention failed.

Ultimately, the definition of SDM has changed over the past years with high heterogeneity in the beginning. Although the emergence of IPDAS criteria (Stacey and Volk 2021) and the International Shared Decision Making Society funneled the definition of SDM interventions to a more unified understanding, it is debatable at what point interventions should be called shared decision making or informed

consent, patient participation, education, and so on. As a consequence, the selection criteria for SDM-interventions in this review should be compared prudently with the existing literature. For the future, shared decision making will most certainly experience constant changes in the underlying definitions – as it did in the past.

Context

Looking at the heterogeneous interventions, clinical settings and conditions, it is difficult to summarize the effects of SDM interventions in a single direction. This is due to different healthcare contexts and baseline resource utilization rates. For instance, a decision about screening is fundamentally different to one about surgery in acute diseases or medication in chronic conditions. Furthermore, looking at its effects, shared decision making can improve patients' medication adherence – increasing costs in the first place but probably decreasing complication rates (and thereby long-term costs) subsequently. While a decision aid in Egypt to inform about medication for juvenile arthritis (El Miedany et al. 2019) leads to increased medication use, a decision aid for patients with hip or knee arthrosis in the United States results in reduced total hip and knee replacements (Ibrahim et al. 2017). All these examples depict opposite – yet desirable – effects and highlight the importance of logic models for proper result interpretation.

Conclusion

This article emphasizes distal and distant effects in shared decision making interventions. The existing SDM literature unfolds a broad spectrum of different interventions which hold potential to improve healthcare outcomes. However, those effects seem to depend on the underlying context.

Outcomes on individual, systemic and clinical levels have been more frequently tackled than interactional and organizational ones.

Based on our findings, we suggest future SDM interventions should spot the current state of SDM for their field of interest, create a logic model for result interpretation, estimate the extent of SDM implementation and consider proximal asides distal and distant effects – emphasizing interactional and organizational outcomes more frequently.

Abbreviations *SDM*: shared decision making; *RCT*: randomized controlled trial; *SR*: systematic review

Supplementary Information The online version contains supplementary material available at <https://doi.org/10.1007/s10389-023-01962-w>.

Authors' contributions FW as the corresponding author drafted the protocol and manuscript and conducted the search alongside MaDe while FS was available for any uncertainties in the selection or extraction process. The idea for this review and parts of the research protocol relate to FG, MD and CB supported result sorting and interpretation. JL and all other authors contributed relevant parts to the methodology and the manuscript's revision process.

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Code availability Not applicable.

Declarations

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Consent for publication Not applicable.

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