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REVIEW

Challenges in the Literature Around Context-Sensitive Implementation of Shared Decision Making in Emergency Medicine: A Scoping Review

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Background: Shared decision making is a healthcare method in which health personnel and patients collaboratively evaluate different management options for medical decisions. Despite possible restraints this method encounters in the context of emergency medicine, there is a growing body of evidence. This article critically appraises the current literature and challenges to inform future research efforts.

Methods: This scoping review respects the PRISMA- and PECOS-methodologies. Qualitative- and quantitative studies were included when exposing emergency health personnel or patients to collaborative care for medical decisions with multiple reasonable management options. PubMed, CENTRAL, APA PsycINFO, Web of Science, reference lists and research group remarks served as data sources. Three researchers handled title- and abstract screening; one researcher extracted and synthesized data. Basic data on study design, publication date, country of origin, estimates for time consumption and more were extracted through standardized forms for all publications. All outcomes from the randomized clinical trials were included and reported, following the authors' conclusions. This includes effects on consultation times. Through tabular visualization, critical appraisal and author group discussions, challenges in the literature were summarized narratively. Neither risk of bias assessment nor meta-analysis were performed.

Results: Of 3954 hits, 3428 remained for the title- and abstract screening and 67 for data synthesis. Studies predominantly utilized observational designs (n=27), originated from the USA (n=50) and were published between 2011 and 2020 (n=46). The included randomized trials (n=6) report heterogeneous results on patient-reported outcome measures and resource utilization. Patient safety was reported as not affected. In three randomized trials, consultations were prolonged by 2 minutes on average. Through critical appraisal and author group discussions, six annotations on the literature on shared decision making in emergency medicine were stipulated.

Conclusion: Research on shared decision making in emergency medicine utilizes different, intertwined terminologies, originates mostly from the USA and focuses on decision aids. The few randomized trials exclude high-risk patients and suggest potential resource-saving effects without compromising patient safety. The formal increase in discussion times appears debatable.

Plain Language Summary: Shared decision making between health professionals and patients might be useful in situations that hold more than one reasonable management option. While health professionals offer facts on the available options, patients contribute their preferences and needs. Shared decision making has been evaluated extensively in non-emergency situations. And even in emergency medicine, there are some articles about it. This literature review aims to outline the existing publications and associated challenges around shared decision making in emergency medicine. Therefore, several literature databases were searched for existing publications by three separate researchers. All publications containing data on patient participation in emergency departments were included in the summary. The narrative synthesis resulted in five annotations: Different terms are being utilized (1); most publications originate from the USA between 2010 and 2020 (2); interventions evaluate shared decision making aids (3); few randomized trials exist and they exclude high-risk patients, yet highlight potential reductions in resource use (4); consultations are reported as slightly prolonged (5), although this effect is debatable, considering qualitative aspects of time.

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These results raise implications for future research efforts that might lead to beneficial effects on aspects around ethics, the economy and patient satisfaction.

Keywords: patient participation, evidence-based medicine, ethics, patient–physician collaboration, health communications, economics, future of healthcare

Introduction

Rationale and Objectives

Different perspectives emphasize the implications for patient participation in healthcare decisions. Ethicists might underline the importance of patient autonomy.[1] Lawyers could add existing legal requirements for patient elucidation (§630 German Civil Code). Economists would probably highlight potential reductions in healthcare resource utilization.[2] Lastly, physicians are likely to throw in possible improvements in the patient–physician relationship and treatment adherence.[3] Consequently, patient-centered care has become subject to ongoing research. One modern concept around patient-centered care should be seen in shared decision making (SDM).[4] Frameworks describe it as patients and providers evaluating several justifiable management options, respecting providers' expertise and patients' preferences likewise.[5] Naturally, the terms *patient participation, patient-centered care, shared decision making, informed consent* and others overlap[6] and are subject to constant development, depending on the underlying values, norms and understandings. This constant development also accounts specifically for the concepts around SDM.[7]

Emergency medicine (EM) poses no exception to efforts of patient-centered care.[8] Just before the turn of the millennium, Yamamoto published two studies, exposing parents of children with fever[9] and skin lacerations[10] towards collaborative care. While these efforts were labeled *informed consent* (yet included aspects of today's SDM), more recent literature is clearly labeled as the latter.[8] At this point, one might argue that emergency departments (EDs) are barely feasible for patient participation as they contain a noisy environment, time restraints and patients potentially holding time-sensitive pathologies.[8] Yet, the most recent systematic review on SDM in EDs by Ubbink et al highlights a relevant number of publications.[11] In addition to their work, this article longs to examine challenges in the literature, moving the discussion from *what* to *why*. For this broad approach, a scoping review was seen as a feasible study design. Furthermore, three questions guided the methodological conception: 1. What is the current evidence on SDM in EM? 2. What effects of SDM interventions on EM do existing randomized clinical trials (RCTs) suggest? 3. Does SDM in EM lead to longer consultation times? These questions were developed together with emergency physicians who – in contrast to the academic literature – face more practical challenges around patient participation in their work. If RCTs suggested benefits in economic aspects or patients' clinical outcomes or satisfaction, this would strengthen the implication for SDM in EM. Lastly, consultation times are repeatedly stated by clinicians as one barrier to the implementation of collaborative care.[12]

Materials and Methods

Protocol and Registration

This scoping review is reported in line with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR)[13] that is depicted in the supplementary material. The review was registered on the Open Science Framework.[14]

Eligibility Criteria, Information Sources and Search

An information specialist (IM) helped to develop the search strategy. It is intended to reflect the different terms used to describe attempts to foster SDM. PubMed, Cochrane Central Register of Controlled Trials, APA Psycinfo and Web of Science were searched until 21st July 2024. Reference lists of included articles and research group remarks were last appraised on 25th July 2024. All publications on human subjects were included if written in English or German. The full search strategy is provided in the supplementary material. Articles were handled in a reference manager (Clarivate End Note 21).

Selection of Sources of Evidence

Utilizing a PECOS framework (Box 1),[15] all publications on settings in the ED and resuscitation services were included. They had to expose patients or health personnel to concepts of collaborative care like patient participation, patient-centered care or informed consent. More than one available and reasonable management option had to be present. Qualitative and quantitative data were eligible from both prospective and retrospective study designs. In detail, RCTs, pre-post-designs, hypothetical scenarios, interrupted time series and observational studies were included. Purely theoretical studies presenting frameworks without new primary or secondary data were omitted. Also, case reports, opinion pieces, editorials, comments, newspapers, letters and grey literature were excluded. Lastly, articles were omitted when examining patients' intention to participate in research, as this poses no decision related to patients' medical treatment in the ED.

Two researchers (FW and DL) independently screened titles and abstracts for eligibility without automation tools. In case of discrepancies, a third author (FS) arbitrated. The same three researchers appraised the articles' full texts afterward.

Data Charting Process and Data Items

One author (FW) extracted data from the included studies. First, on all publications, basic information was retrieved, including first author, publication date, country, topic, participant numbers, study design and a short narrative summary of the authors' conclusions. Second, all included publications were scanned in full text for the effects of SDM on consultation times in EM. The average consultation times were extracted alongside the standard deviation and p-values. Third, all outcomes from the RCTs were collected and their results stated according to the authors' conclusions. RCTs were chosen as the only source for outcome results as their design offers a solid level of scientific validity.

All extracted data were visualized in separate forms created in a word processing program (Microsoft Word). Compared to the initial study protocol, these sheets received modifications during the extraction process.

Synthesis of Results

For overview purposes, five major study design categories were defined: (1) observational (including interviews, surveys, etc).; (2) development and implementation reports; (3) non-randomized interventions and hypothetical scenarios; (4) randomized interventions and their secondary analyses; (5) literature reviews; (6) mixed methods designs. Each publication was sorted into one category and results were visualized in a hierarchical figure. Apart from that, the countries were displayed on a world map. Lastly, the results from RCTs alongside effects on consultation times were summarized in tables.

Box 1 PECOS-Scheme

Population: patients and health professionals facing medical decisions in emergency departments or prehospital resuscitation services with more than one reasonable management option, excluding the decision to participate in research.
Exposure: efforts to engage health personnel and patients in collaborative decision making (shared decision making) including patient activation, information, decision participation, preference elicitation or values clarification.
Control: studies without control groups (eg observational studies) will be included likewise.
Outcomes: For overview purposes, all publications will be summarized narratively. All included publications will be scanned for changes in consultation times. From the randomized clinical trials, all primary and secondary outcomes will be extracted.
Study types included: Qualitative and quantitative studies such as randomized controlled trials, non-randomized trials, pre-post designs, hypothetical scenarios, interrupted time series, observational studies (prospective and retrospective), cross sectional studies (interviews and surveys).
Study types excluded: Theoretical studies without real-life data, case reports, opinion pieces, editorials, comments, newspapers, letters.

The resulting tables and figures were critically appraised and discussed within the author group, respecting all included publications. Results were described narratively. Neither meta-analysis nor statistical evaluation were performed.

Results

Selection of Sources of Evidence

The search strategy yielded 3954 hits, of which 3428 remained after duplicate removal. Sorting out 3359 of them during title- and abstract screening and 10 during full-text appraisal left 59 publications for data extraction. On the other hand, 8 publications were added by searching through the included publications' reference lists or by research group remarks.[16,34,46,55,56,59,68,76] This process resulted in a total of 67 publications included in further data synthesis (Figure 1).[9,10,12,16–79] All articles removed during full-text appraisal are listed in the supplementary material.[80–89]

Characteristics and Results of Sources of Evidence

All included publications are listed in Table 1. As for study designs, 27 publications are of observational design and 12 publications report on developments or implementations of interventions, teaching programs or tools to measure SDM. Furthermore, 10 publications depict hypothetical scenarios or non-randomized interventions. Aside, 4 publications utilize mixed-method designs. An additional 6 publications report on randomized contorlled trials and 4 on secondary analyses of those RCTs. Lastly, 4 publications are literature reviews (Figure 2).

Looking at geographic distributions, 50 of the 67 publications originate from the USA and 9 from Nordic countries (Norway 1, Denmark 2, Sweden 6). Germany, the UK, Canada and Taiwan all contribute 1 article each. The remaining reports (4) are literature reviews (Figure 3). As for publication dates, 2 articles were published before 2000, 3 between 2000 and 2010, 46 between 2011 and 2020 and 16 after 2020. Different topics are depicted in the studies, ranging from general perceptions of SDM by patients[71] and healthcare providers[12] over deciding between different treatment options

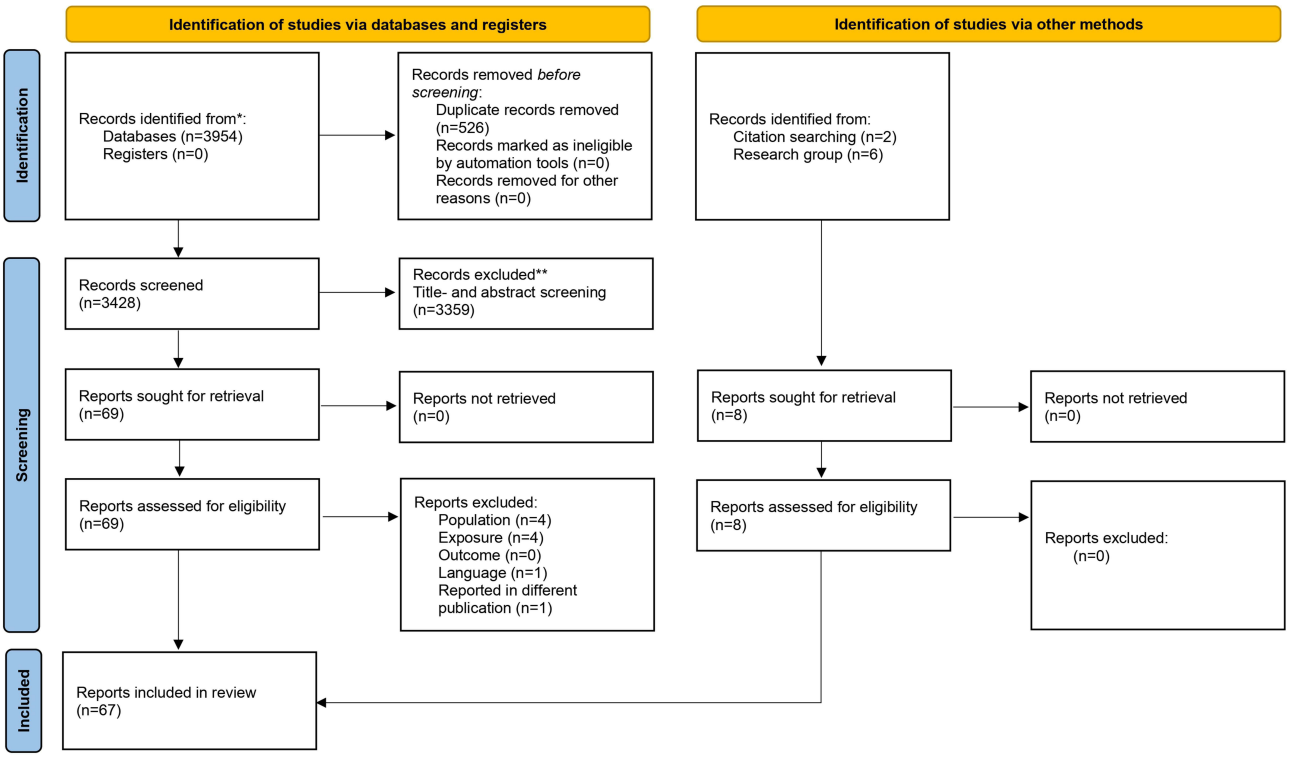

Figure 1 Adapted search flow diagram following the PRISMA 2020 statements.
Notes: PRISMA figure adapted from Tricco AC, Lillie E, Zarin W et al. PRISMA Extension for Scoping Reviews (PRISMA-ScR): Checklist and Explanation. Ann Intern Med. 2018 Oct 2;169(7):467–473. doi: 10.7326/M18-0850. Epub 2018 Sep 4. PMID: 30178033. Creative Commons.[13]

Table 1 Included Publications

Number	First Author YEAR Country	Study Design	Data Collection Method	Topic	Population	Narrative Summary	Comments
1	Anderson 2021 USA[16]	Development of decision aid	Multiple data collection methods	Antibiotic choice in pediatric acute otitis media	Development team including different professions and patients	Decision aid completed	/
4	Aronson 2021 USA[17]	Development of decision aid	Multiple data collection methods	Diagnostic work-up in febrile infants	Development team including different professions and patients	Decision aid completed	/
	Aronson 2019 USA[18]	Observational	Interviews	Perform lumbar puncture in febrile infants?	N=23 physicians and nurses	Barriers and facilitators described	/
	Aronson 2021 USA[19]	Observational	Interviews	Perform lumbar puncture in febrile infants?	N=23 parents of febrile infants	Parents' views described	/
6	Aronson 2022 USA[20]	Observational	Interviews	Hospitalizations in children with bronchiolitis	N=44 physicians, nurses and parents	Most hospitalizations indicated by physicians; clinicians' barriers to SDM described	/
	Aronson 2018[21]	Narrative review	/	Shared decision making for parents of acutely ill children	N=10 studies	Authors state missing evidence	Some included studies not performed in emergency departments or resuscitation services
7	Barnes 2016[22]	Systematic review	/	Decision aids for anticoagulation in venous thromboembolism	N=2 studies	Authors state missing evidence	One study conducted in primary care
8	Bean 2021 USA[23]	Mixed methods: Implementation of decision aid and observational	Questionnaires and interviews	Work-up in adults with atraumatic chest pain	N=19 physician interviews; n=184 study participants (patients)	Barriers and facilitators described; patients satisfied with SDM; physicians describe limited acceptance	SDM part of complex intervention including standardized work-up and risk stratification score
9	Billah 2022 USA[24]	Observational	Interviews	Decision aids in EDs	N=20 physicians	Barriers and facilitators described	/

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Table 1 (Continued).

Number	First Author YEAR Country	Study Design	Data Collection Method	Topic	Population	Narrative Summary	Comments
10	Chartash 2021 USA[25]	Mixed methods: development of language processing tool and retrospective analysis of ED notes	/	Broad spectrum of conditions	N=600 ED-notes examined	Language processing tool developed; factors influencing the appearance of SDM described (eg gender and race)	/
11	Coronado-Vázquez 2019[26]	Systematic review	/	Available SDM-tools in EDs	N=4 studies	SDM might increase knowledge and satisfaction	/
12	Cullison 2016 USA[27]	Observational	Questionnaires	Analgetic choice in musculoskeletal pain	N=157 older patients	SDM associated with greater satisfaction with analgesia; no association between SDM and pain reduction or actual analgetic selection	/
13	Dubois 2023 Sweden[28]	Development of observation tool for patient participation	Multiple data collection methods	Patient involvement in emergency situations	/	Observation tool developed	/
14	Dyrstad 2015 Norway[29]	Observational	Interviews	Admit older patient to hospital?	N=27 physicians	Barriers and facilitators described	/
15	Eriksson-Liebon 2021 Sweden[30]	Observational	Interviews	Involving ED patients in their care	N=16 patients	Expectations and experiences described	/
	Fabricius 2022 Denmark[31]	Observational	Observations and interviews	Medication decisions in older patients with polypharmacy	Healthcare providers (physicians, nurses and more) and older patients with polypharmacy; N=65 observations; N=14 interviews	Barriers and facilitators described	/
16	Fabricius 2021 Denmark[32]	Observational	Observations and interviews	Medication decisions in older patients with polypharmacy	Healthcare providers (physicians, nurses and more); N=48 healthcare providers observed; N=20 interviews	Barriers and facilitators described	/
18	Flynn 2012[33]	Systematic review	/	SDM in EDs	N=5 studies	SDM might increase patients' knowledge and satisfaction and decrease resource use	/

19	Flynn 2015 United Kingdom[34]	Development of decision aid	Multiple data collection methods	Perform thrombolysis in acute stroke?	Development team including different professions and patients	Decision aid completed	/
20	Frank 2009 Sweden[35]	Observational	Interviews	Patient participation in emergency care	N=11 healthcare professionals	Caregivers' conceptions of patient participation described as conditional	/
21	Frank 2009 Sweden[36]	Observational	Interviews	Patient participation in emergency care	N=9 patients	Three conceptions described: being acknowledged, struggling to be involved, having clear space	/
22	Frank 2011 Sweden[37]	Development of questionnaire	Questionnaire development process based on patient sample	Patient participation in emergency departments	N=356 patients	Questionnaire developed	/
23	Frank 2011 Sweden[38]	Observational	Questionnaires	Patient participation in emergency departments	N=356 patients	Patient participation described as requiring improvement	/
24	Freeman 2020 USA[39]	Observational	Questionnaires	Stool collection through patient or providers in suspected occult blood?	N=100 patients	51% of patients chose to collect samples themselves; younger patients tend more towards self-collection than older patients	/
25	Gafni-Pappas 2018 USA[40]	Pre-post design	Data from healthcare records	Hospital admission or discharge in atraumatic chest pain	N=13445 patients	Hospital admissions decreased while rate of adverse events was unchanged	Complex intervention including diagnostic protocol and risk score
26	George 2022 Germany[41]	Development of decision aid	Multiple data collection methods	Hospital admission in palliative patients at end of life	Development team including different professions and patients	Decision aid completed	Decision aid includes additional aspects around palliative care
27	Geyer 2014 USA[42]	Mixed methods: Hypothetical scenario and observational	Questionnaires	Perform computed tomography to detect pulmonary embolism?	N=203 patients	37% of patients refused testing	/
28	Hadden 2020 USA[43]	Pre-post design evaluating decision aid	Questionnaires and healthcare records	Hospital admission or discharge in atraumatic chest pain?	N=169 patients	Hospital admissions decreased; knowledge increased; no differences in decisional conflict, satisfaction or health literacy	/

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Table 1 (Continued).

Number	First Author YEAR Country	Study Design	Data Collection Method	Topic	Population	Narrative Summary	Comments
30	Hess 2016 USA[44]	RCT evaluating decision aid	Questionnaires and healthcare records	Further work-up in atraumatic chest pain	N=898 patients	Knowledge increased; resource use decreased; patient safety unchanged	/
31	Hess 2018 USA[45]	RCT evaluating decision aid	Questionnaires and healthcare records	Computed tomography or active observation in children with head trauma?	N=971 children with head trauma and their parents	Knowledge increased; mixed results for resource use; patient safety unchanged	/
	Hess 2012 USA[46]	RCT evaluating decision aid	Questionnaires and healthcare records	Further work-up in atraumatic chest pain	N=204 patients	Knowledge increased; resource use decreased; patient safety unchanged	/
32	Holland 2016 USA[47]	Observational	Questionnaires	Analgetic choice in acute musculoskeletal pain	N=94 older patients	SDM associated with patient satisfaction; not associated with analgetic choice or pain reduction	/
33	Hull 2015 USA[48]	Observational	Questionnaires	Perform computed tomography in children?	N=350 parents and their children	When likelihood of positive findings decrease, parents are less willing to opt for computed tomography; patients demand informed consent	/
34	Hung 2022 Taiwan[49]	Observational	Questionnaires	Effects of SDM	N=165 patients in emergency observation units	SDM showing mediating effect on healthcare satisfaction	/
35	Ijaz 2017 USA[50]	Observational	Questionnaire	Perform computed tomography?	N=100 patients receiving computed tomography	Same amount of patients who want to participate/not participate in decision making	/
36	Ijaz 2018 USA[51]	Observational	Questionnaires, observations and healthcare records	Perform computed tomography?	N=29 patients with abdominal pain	Patient and provider preferences not associated with involvement; preferences not associated with computed tomography rates	/
37	Isaacs 2013 USA[52]	Observational	Questionnaires	Analgetic choice in acute musculoskeletal pain	N=111 older Patients	Greater participation associated with satisfaction and pain reduction	/
38	Kanzaria 2015 USA[53]	Observational	Questionnaires	Potential and barriers of SDM	N=435 physicians	Barriers and facilitators described	/
39	Kanzaria 2020 USA[54]	Implementation of teaching program	Observations	Different scenarios	N=28 emergency medicine residents	75% of residents able to reproduce all steps from SDM-process two months after training	/

40	Karpas 2009 USA[55]	Non-randomized intervention	Questionnaire	Oral or venous rehydration in children with vomiting and/or diarrhea?	N=260 children and their parents	38% preferred oral, 62% intravenous rehydration	/
41	Karpas 2013 USA[56]	Non-randomized intervention	Questionnaire	Perform observation or head computed tomography in children with head injury?	N=134 children and their parents	57% preferred observation, 40% immediate computed tomography	/
42	Melnick 2017 USA[57]	Development of decision aid	Multiple data collection methods	Computed tomography, observation or discharge in traumatic head injury?	Development team including different professions and patients	Decision aid completed	/
43	Merck 2015 USA[58]	Pre-post design	Health records	Informed consent for computed tomography	N=7684 patients	Implementation of informed consent associated with decrease in computed tomography utilization in low-risk patients	/
44	Minneci 2019 USA[59]	RCT using decision aid	Questionnaires and healthcare records	Surgery or conservative treatment in pediatric appendicitis?	N=200 children and their parents	No difference in several outcomes	/
45	Obadeyi 2020 USA[60]	Non-randomized intervention	Questionnaires	Perform landmark- or ultrasound-guided placement of intravenous catheter?	N=50 patients	Decision aid improved knowledge; more patients preferred landmark-based placement	/
46	Omaki 2021 USA[61]	RCT evaluating decision aid	Questionnaires	Opioid prescriptions	N=224 patients	Knowledge increased; pain control unchanged	/
47	Poitras 2020 Canada[62]	Development of decision aid	Multiple data collection methods	Usual care or case management in patients with complex healthcare resource needs?	Development team including different professions and patients	Decision aid completed	/
	Probst 2018 USA[63]	Development of decision aid	Multiple data collection methods	Hospital admission or discharge in syncope?	Development team including different professions and patients	Decision aid completed	/
48	Probst 2016 USA[64]	Observational	Questionnaires	Common clinical presentations	N=709 physicians	Barriers and facilitators described; SDM seen as helpful and not leading to more lawsuits	/

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Table 1 (Continued).

Number	First Author YEAR Country	Study Design	Data Collection Method	Topic	Population	Narrative Summary	Comments
	Probst 2020 USA[65]	RCT evaluating decision aid	Questionnaires and healthcare records	Hospital admission or discharge in syncope?	N=50 patients	No difference in outcomes	Study not powered to detect differences
50	Probst 2018 USA[66]	Secondary analysis of RCT evaluating decision aid	Statistical evaluations	Point of time and extent of further cardiac work-up in atraumatic chest pain	N=898 patients	Study site and decision aid use associated with involvement; higher health literacy associated with greater involvement desire	/
52	Rising 2018 USA[67]	Secondary analysis of RCT evaluating decision aid	Statistical evaluations	Point of time and extent of cardiac work-up in atraumatic chest pain focusing on vulnerable patients	N=898 patients	No clear benefits for vulnerable patients	/
53	Rodriguez 2014 USA6[68]	Hypothetical scenarios	Questionnaires	Perform computed tomography?	N=941 patients with trauma	Most patients prefer discussing radiation risks and costs; when odds of life-threatening disease decrease, fewer patients opt towards computed tomography	/
54	Rosen 2023 USA[69]	Pre-post design evaluating decision aid	Multiple data collection methods	Surgical or conservative treatment in adult appendicitis?	N=24 patients	Decisional conflict unchanged; knowledge increased	/
	Schoenfeld 2019 USA[12]	Observational	Interviews	Perceptions of SDM	N=15 physicians	Barriers and facilitators described	/
55	Schaffer 2018 USA[70]	Secondary analysis of RCT evaluating decision aid	Statistical evaluations	Point of time and extent of cardiac work-up in atraumatic chest pain	N=898 patients	Resource utilization decreased; other outcomes not compromised	/
	Schoenfeld 2018 USA[71]	Observational	Interviews	Perceptions of SDM	N=29 patients and proxies	Barriers and facilitators described	/
56	Schoenfeld 2016 USA[72]	Observational	Interviews	Motivations for using SDM	N=15 physicians	Barriers and facilitators described; some physicians unaware of term "shared decision making"	/
58	Schoenfeld 2018 USA[73]	Observational	Interviews	Use of SDM	N=15 physicians	Implications for resident education in SDM identified	/

	Schoenfeld 2020 USA[74]	Development of decision aid	Multiple data collection methods	Perform computed tomography in suspected uncomplicated ureterolithiasis?	Development team including different professions and patients	Decision aid completed	/
59	Schoenfeld 2018 USA[75]	Observational	Questionnaires	Preferences for SDM	N=661 patients	Patients hold desire to be involved in decision; some patients wait for their physicians to involve them	/
62	Schoenfeld 2019 USA[76]	Hypothetical scenario	Questionnaires	Different conditions	N=804 patients	Patients exposed to SDM less likely to file lawsuit	/
	Schoenfeld 2019 USA[77]	Observational	Questionnaires	Presence of SDM	N=285 patients	Less than half of patients reported being involved in decision; SDM connected to patients' high rating of discussions; most SDM discussions happened around disposition decisions	/
64	Skains 2020 USA[78]	Secondary analysis of RCT evaluating decision aid	Statistical evaluations	Computed tomography or active observation in children with head trauma?	N=971 children and their parents	Trust in physician increased in socioeconomically disadvantaged patients	/
65	Walker 2021 USA[79]	Development of conversation guide	Multiple data collection methods	Extent of care – CPR yes/no, symptom relief vs repair	Development team including different professions and patients	Conversation guide completed	/
66	Yamamoto 1997 USA[9]	Non-randomized intervention	Questionnaires	Perform lumbar puncture in febrile children?	N=37 children and their parents	When physicians gave no recommendation, most patients chose against testing	/
67	Yamamoto 1997 USA[10]	Mixed methods (1) non-randomized intervention, (2) hypothetical scenario	Questionnaires	Perform procedural sedation and choice of local infiltrate for children with skin lacerations	N=45 children and their parents	All parents refused sedation; for local infiltrate, more patients chose lidocaine over tetracaine-adrenaline-cocaine	/

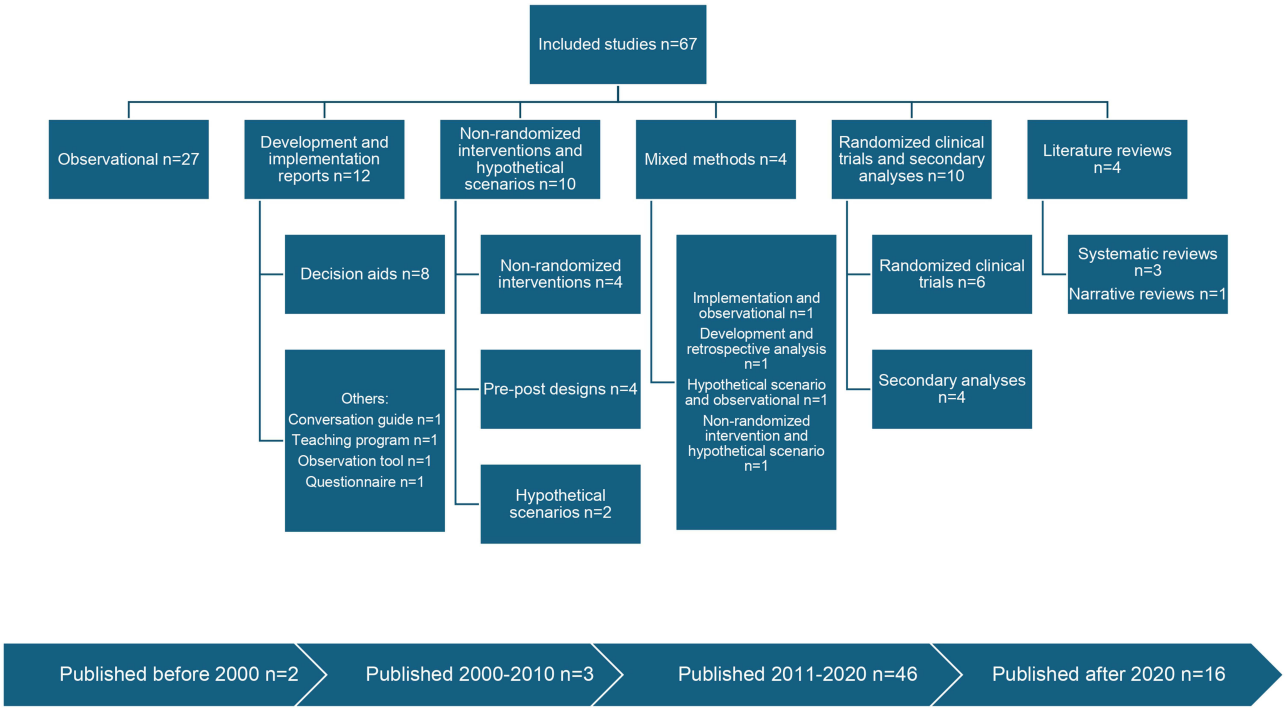

Figure 2 Designs and publication dates of included studies.

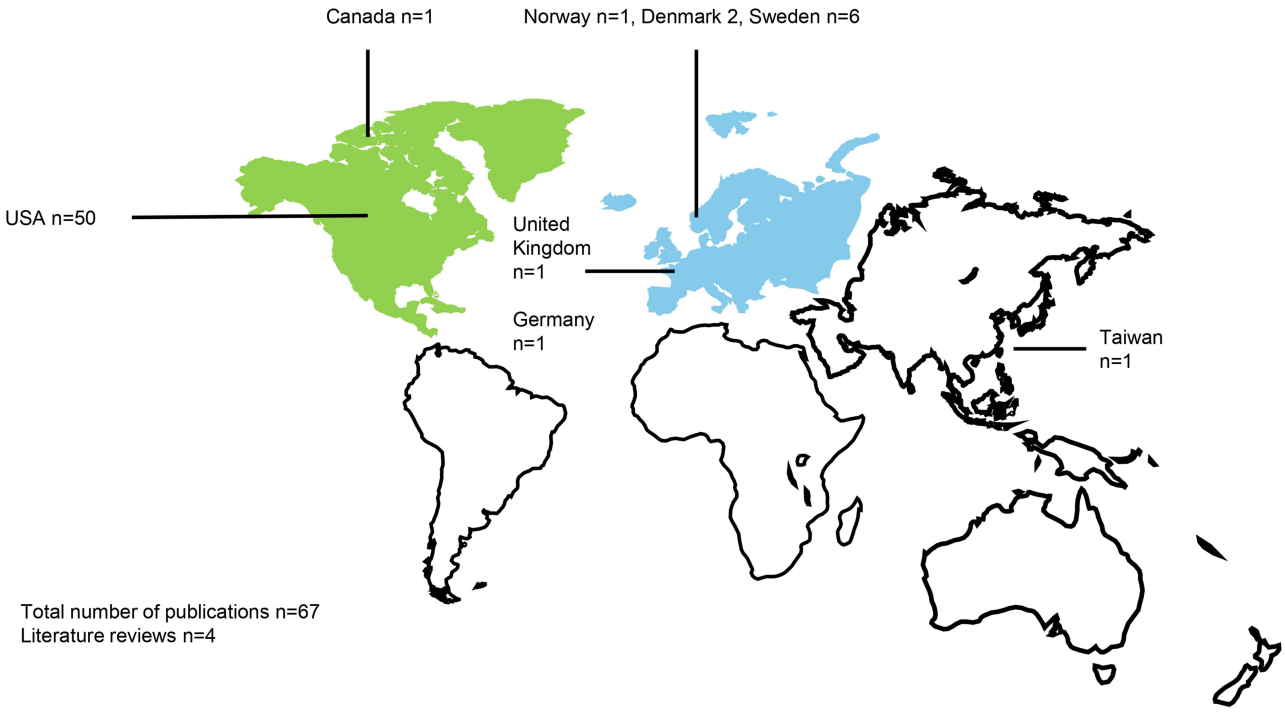

Figure 3 Publications sorted by country.

(eg oral vs venous rehydration in children with vomiting and diarrhea)[55] up to medication decisions in older patients.[31] Study participant numbers range from n=9[36] to n=13445.[40]

All outcomes in the 6 RCTs[44–46,59,61,65] were extracted and appraised, following the authors' conclusions (Table 2). Apart from patient-reported outcome measures (PROMs),[44–46,59,61,65] studies examined effects on resource utilization rates,[44–46,59,61,65] clinical outcomes[59,61] and patient safety.[44–46,59,65] These outcome effects are reported with heterogeneous effects – ranging from no effect to improvements. While clinical outcomes and patient safety are described as not being affected, the results for PROMs and resource utilization rates differ between improvement and no change. No declines are reported.

Respecting all 67 included studies for estimates of discussion time modifications through SDM suggests an average increase of 2 minutes in 3 randomized trials.[44,45,65] Another study (decision aid development report)[34] solely reported on how long participants spent with the developed information material (Table 3).

Discussion

Summary of Evidence

This scoping review includes 67 publications reporting qualitative and/or quantitative data on SDM in EM.[9,10,12,16–79] They utilize different observational and interventional study designs. All publications were sorted according to their study design, country and reported results. During the subsequent discussion within the author group, five annotations were phrased.

Annotation #1

Certain terms and definitions are blurry and intertwined.

Substantiation

Human communication involves language, interactions, social norms and more. The definitions and concepts around these intertwine and evolve. This also accounts for SDM.[6] Looking specifically at EM, the terms informed consent, patient participation and SDM are used with different yet partially overlapping operationalizations. While Yamamoto in 1997 used the term *informed consent* when exposing children alongside their parents to different possible managements in fever[9] or skin lacerations,[10] more recent interventions by Hess in patients with nontraumatic chest pain are labeled *shared decision making*.[44] At the same time, these publications show parallels in their intervention designs. The range in terminologies should be considered when appraising the literature, as some reports might otherwise be missed. More recent and (partially) consented concepts for SDM are described in the papers published by members of the International Shared Decision Making Society (ISDM).[90] Apart from that, another potential misunderstanding occurred: the term *decision aid* is sometimes used to describe clinician-directed tools that assess patients' risk profiles or illustrate management pathways.[91] This is in contrast to the concept of decision aids by the ISDM. Here, decision aids depict material that informs and activates patients, supporting their decision process.[92] To clarify this, future interventions could utilize the term *shared decision making aid.*

Annotation #2

The available literature predominantly originates from the USA between 2011 and 2020.

Substantiation

While Denmark, Norway, Germany and Canada contribute single publications, the majority is reported from studies in the USA. In a brainstorming approach, one could postulate several reasons for explanation: a) EM is a standalone medical specialty in the USA, b) SDM is supposed to meet medicolegal and economic expectations – both important parts of emergency healthcare in the USA, c) the American emergency healthcare system might be more curious towards innovations. Definite proof of such assumptions lies beyond the scope of this review.

Annotation #3

Interventions focus on evaluating shared decision making aids.

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Table 2 Outcome Effects in Randomized Clinical Trials on Shared Decision Making in Emergency Medicine According to Authors' Conclusions

Outcomes	Hess 2012[46] Chest Pain USA	Hess 2016[44] Chest Pain USA	Hess 2018[45] Head Computed Tomography USA	Minneci 2019[59] Pediatric Appendicitis USA	Omaki 2020[61] Pain Medication USA	Probst 2020[65] Syncope USA No Sufficient Power in Study to Detect Differences
Knowledge of disease	Self-created questions	Self-created questions	Self-created questions	Self-created questions	Self-created questions	Self-created questions
Decisional conflict and Decisional self-efficacy	Decisional Conflict Scale	Decisional Conflict Scale	Decisional Conflict Scale	Decisional Conflict Scale and Decisional Self-Efficacy Scale	Decisional Conflict Scale	Decisional Conflict Scale
Patients' trust in physician	Trust in Physician Scale	Trust in physician scale	Trust in physician scale			
Patients' engagement in SDM/decision	OPTION scale	OPTION scale	OPTION scale	Preparation for Decision Making Scale and Parent-Patient Activation Measure	Self-created questions	OPTION scale
Patients' satisfaction				Healthcare satisfaction through PedsQL	Comfort with different analgetics through self-created questions	Satisfaction with care through self-created questions
Management/ resource use	Observation unit admissions and cardiac stress testing	Rates of hospital admission, cardiac stress testing, coronary computed tomography, percutaneous coronary intervention, coronary bypass grafting	Rates of computed tomography within one week after event, laboratory, primary and specialty visits, ED length of stay, hospital admissions, bouncebacks	Length of hospital stay, readmissions, choice between operative and non-operative management	Opioid prescription rates	Rates of hospital and observation unit admissions
Clinical outcome				Disability days after 1 year and health-related quality of life through self-reports and PedsQL 4.0	Pain control through visual analogue scale	

Patient safety	Major adverse cardiac events	Major adverse cardiac evens	Missed traumatic intracerebral bleedings	Failure of non-operative management and complicated appendicitis rate		New relevant clinical diagnosis
Evaluation of intervention and decision making process	Patients' satisfaction with decision process and clinicians' satisfaction with decision aid – self-created questions	Helpfulness of information and decision aid via self-created questions	Satisfaction with decision and information			Patients' and providers satisfaction with information

Notes: Improvement; Unchanged; Mixed results; Decline

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Table 3 Effects of Shared Decision Making Interventions on Consultation Times in Emergency Medicine

First Author And Year	Topic	Study Type	Time Measurement	SDM Time Consumption
Flynn 2015[34]	Thrombolysis in acute stroke	Decision aid development report	Decision aid usage time measured through the electronic device the decision aid was presented on	Usage time between 0.7 and 30 minutes Median 2.8 minutes, IQR 7.6 minutes
Hess 2016[44]	Chest pain	Randomized controlled trial of decision aid	Discussion time between doctors and patients taken from audio and video recordings	Usual care: 3.1 minutes (standard deviation 0.29 minutes) Intervention: 4.4 minutes (standard deviation 0.40 minutes) Discussions 1.3 minutes longer (P=0.008)
Hess 2018[45]	Head computed tomography after trauma	Randomized controlled trial of decision aid	Discussion time between doctors and patients taken from audio and video recordings	Usual care: 5.5 minutes (standard deviation 0.20 minutes) Intervention: 7.6 minutes (standard deviation 0.40 minutes) Discussions 2 minutes longer (P<0.01)
Probst 2020[65]	Syncope	Randomized controlled trial of decision aid	Discussion time between doctors and patients taken from audio and video recordings	Usual care: 3.29 minutes (standard deviation 0.20 minutes) Intervention: 5.26 minutes (standard deviation 0.40 minutes) Discussions 1.57 minutes longer (p=0.003)

Substantiation

While the spectrum of included topics varies, shared decision making aids depict the preponderant part of evaluated interventions – apart from one training program for residents.[54] Decision aids are evidence-supported information and activation sources assisting patients throughout the decision process. Their focus lies in enabling the patient to make medical decisions that are in line with existing needs and predilections (preference sensitivity). The existing IPDAS-criteria frame methodologies around decision aid development.[82] An extensive Cochrane review revealed the potential of decision aids to positively influence various aspects of healthcare.[93]

Annotation #4

Few randomized SDM interventions have been enrolled. They exclude high-risk patients and suggest potential reductions in healthcare resource utilization in certain patient groups.

Substantiation

A total of 6 publications, plus additional secondary analyses, report on RCTs evaluating shared decision making aids. While their effects on patient-reported outcome measures differ, 3 studies around chest pain[44,46] and head computed tomography[45] highlight potential reductions in resource utilization without affecting patients' safety. This is also described in the most recent meta-analysis by Ubbink et al.[11] It should be noted that these results are limited to patients with certain leading symptoms and low to intermediate risk profiles. One might insinuate that such low-risk patients probably receive overdiagnosis, which could safely be omitted, or, through SDM, collaboratively prevented. While all randomized interventions currently originate from the USA using shared decision making aids, there might be different outcome effects in future, multimodal interventions from other countries.

Annotation #5

The effects on consultation times appear debatable.

Substantiation

As for quantitative aspects, the existing trials suggest an increase of about two minutes on average.[44,45,65] However, this

Box 2 Implications for Future Research Around Shared Decision Making in Emergency Medicine

Potential implications:

- Examining patients' feasibility for SDM alongside influencing factors (eg risk profile, symptom burden)
- Determining the impact of patients' social determinants and clinicians' bias on the SDM-process
- Engaging vulnerable patient groups
- Creating and evaluating methods to measure the SDM-process and effects
- Enrolling standardized clinician-targeted training programs
- Implementing more complex, multifaceted interventions

should not be deemed a certainty at this point. Discussion times were measured after intervention implementation and clinicians probably had to adapt to the concepts of SDM. In the long term, the increase in discussion times could be reversed. Here, long-term data is missing. Furthermore, avoiding one hospital admission in a patient with nontraumatic chest pain includes a greater reduction in resource utilization than two additional minutes in discussion times poses an increase. Apart from these economic evaluations, one might even ask whether increasing patients' autonomy and participation justifies increased consultation times (qualitative vs quantitative aspects of time).[94]

Respecting these five annotations led to a range of potential implications for future research around SDM in EM (Box 2). They include new concepts for patients' SDM-feasibility, training programs for clinicians, measurement tools and implementation through complex interventions that demonstrated efficacy outside the emergency context.[95]

Limitations

Although a broad search strategy was installed using different terms and databases, some existing publications might have been missed. This is due to the different labeling of interventions (like *shared decision making, patient-centered care, informed consent, decision support, patient participation* …). These intertwingled terms depict dynamic concepts with evolving definitions and understandings. Also, some studies were excluded as their subjects greatly differed from the idea that SDM requires more than one reasonable management option. Here, one cannot argue with definite certainty as to what studies to in- or exclude. As for now, the most comprehensive definition of SDM could be seen in the consensus papers of the International Shared Decision Making Society[80] and officially validated frameworks such as the IPDAS criteria.[82]

Apart from these inaccuracies around the concepts of SDM, it is even debatable where EM begins. In this article, it is operationalized as happening in EDs or rescue services. Yet, there are also interventions aimed at primary care practices where patients present with acute problems. This would result in a greater number of studies being included. However, it appears reasonable to define EM as happening in EDs and resuscitation services, as both are scientifically targetable organizational structures.

Lastly, two limitations should be noted. While readers find a comprehensive overview of the current state of literature on SDM in EM, no meta-analysis or statistical evaluations were performed. Therefore, definite certainty in the quantitative estimates is not given, although the narrative results in this review predominantly match with the meta-analysis by Ubbink et al.[11] Lastly, data extraction was performed by a single researcher, potentially enabling bias. However, results were appraised and discussed within the author group afterwards.

Conclusions

Through a scoping review approach, five remarks on the current literature around SDM in EM were stipulated: First, the underlying terms and definitions hold partially varying and evolving terminologies. Second, most studies originate from the USA between 2011 and 2020 and utilize observational study designs. Third, interventional studies focus on evaluating shared decision making aids. Fourth, randomized trials exclude patients at high risk of serious conditions or adverse events. Utilizing SDM for diagnostic and disposition decisions in low to moderate-risk patients with nontraumatic chest pain reduced resource utilization while not affecting patient safety. The number of randomized trials is yet limited. Fifth, consultation times in EM were prolonged through SDM by about two minutes on average,

although qualitative aspects of time might diminish this prolongation. Future research projects could include more extensive implementation through complex interventions or more differentiated concepts around patients' feasibility for SDM.

Abbreviations

ED, Emergency department; EM, Emergency Medicine; SDM, Shared decision making; RCT, Randomized controlled trial; PROM, Patient-reported outcome measure

Data Sharing Statement

The study protocol and reference manager dataset are accessible through a data repository within the Open Science Framework (https://doi.org/10.17605/OSF.IO/CA7XU).[14]

Author Contributions

All authors made a significant contribution to the work reported, whether that is in the conception, study design, execution, acquisition of data, analysis and interpretation or in all these areas; took part in drafting, revising or critically reviewing the article; gave final approval of the version to be published; have agreed on the journal to which the article has been submitted; and agree to be accountable for all aspects of the work.

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