

# Shared Decision-making in Trauma and Emergency Surgery Settings: A Literature Review

Francesca Dal Mas<sup>1</sup>, Maurizio Massaro<sup>1</sup>, Sarah Woltz<sup>2</sup>, Federico Ruta<sup>3</sup>, Fausto Catena<sup>4</sup>, Paola Fugazzola<sup>5</sup>, Luca Ansaloni<sup>5,6</sup> and Lorenzo Cobianchi<sup>5,6</sup>

<sup>1</sup>Department of Management, Ca' Foscari University of Venice, Venice, Italy

<sup>2</sup>Department of Surgery, Spaarne Gasthuis, Hoofddorp, The Netherlands

<sup>3</sup>General Direction, ASL BAT (Health Agency), Andria, Italy

<sup>4</sup>Emergency and Trauma Surgery, Bufalini Hospital, Cesena, Italy

<sup>5</sup>General Surgery Department, IRCCS Policlinico San Matteo Foundation, Pavia, Italy

<sup>6</sup>Department of Clinical, Diagnostic and Pediatric Sciences, University of Pavia, Pavia, Italy

[francesca.dalmas@unive.it](mailto:francesca.dalmas@unive.it)

[maurizio.massaro@unive.it](mailto:maurizio.massaro@unive.it)

[s.woltz@hotmail.com](mailto:s.woltz@hotmail.com)

[federicorutabat@gmail.com](mailto:federicorutabat@gmail.com)

[faustocatena@gmail.com](mailto:faustocatena@gmail.com)

[paola.fugazzola@gmail.com](mailto:paola.fugazzola@gmail.com)

[luca.ansaloni@unipv.it](mailto:luca.ansaloni@unipv.it)

[lorenzo.cobianchi@unipv.it](mailto:lorenzo.cobianchi@unipv.it)

**Abstract:** Emergency teams are made up of professionals of different specialities, including emergency physicians, surgeons, anesthesiologists, and nurses. Such units are characterized by the need to face unexpected situations with little time to make clinical decisions. In trauma and emergency settings, clinicians must act in a coordinated way, ensuring, at the same time, proper knowledge transfer and sharing to reach the best possible result for the patient. While such dynamics must be explicit and clear within the team, involving the patient in the decision-making process may require additional tools and procedures. Indeed, the time to engage with the patient and the family to understand the patient's wishes and treatment preferences may be limited or absent at all. While the so-called shared decision-making (SDM) stands as one of the pillars of the modern patient-centric healthcare scenario, knowledge translation and transfer dynamics may appear particularly challenging in emergency settings. Starting from an investigation of the recent literature on SDM, the paper presents a literature review of the barriers, facilitators, and knowledge translation dynamics of SDM in trauma and emergency surgery. Results assess the importance, tools, and dynamics of SDM processes.

**Keywords:** Emergency teams, Patients' perspective, Surgery, Shared-decision Making, Knowledge translation

---

## 1. Introduction

Trauma and emergency surgery teams comprise a broad group of healthcare specialists who work together to deliver high-quality care under challenging circumstances, including emergency physicians, surgeons, anesthesiologists, and nurses. Knowledge management looks critical in trauma and emergency situations, with teams working under extreme stress and time pressures, with little awareness of the trauma's causes, the patient's identity, current circumstances or conditions, or care preferences (Cobianchi, Dal Mas, Massaro, Fugazzola, Catena, *et al.*, 2021). While team dynamics are crucial, knowledge translation and sharing processes appear strategic both within the team and in the relationship with the patients and their families (Cobianchi, Dal Mas, Massaro, Fugazzola, Coccolini, *et al.*, 2021). Trauma and emergency professionals may not have enough time to discuss with their patients about the treatment options, the current situation, or what they should expect in the short and long run (Stahel *et al.*, 2022).

The importance of shared decision-making (SDM) in patient-centred care is well acknowledged. SDM is a method in which healthcare providers and patients collaborate to make decisions based on the best available evidence while taking into account the patients' treatment preferences and values. SDM is expected to increase patient adherence to treatment and, as a result, health outcomes. In particular, SDM stands as the most promising option for preference-sensitive decisions. That is, decisions in which two or more similar treatment options exist and the optimum choice is based on how each patient values the risks and advantages of each treatment option (Mathijssen *et al.*, 2020). SDM stands as a pillar of patients' autonomy in contemporary health care. Therefore, physicians have the ethical and moral duty to support patients in making decisions that encompass their values

and priorities (Woltz *et al.*, 2018). Engaging in SDM means, for both physicians and patients, finding effective ways and tools of translating and sharing knowledge, despite their differences in terms of education, clinical mastery, feelings, and emotions (Graham *et al.*, 2006; Lemire *et al.*, 2013). The literature has underlined the importance of adequate tools to support such a process (Dal Mas, Garcia-Perez, *et al.*, 2020; Gibbon, 2011), especially the role of soft or non-technical skills to improve communication (Dal Mas *et al.*, 2021; Lepeley, 2021; Stahel *et al.*, 2022).

Recent studies have highlighted how, in trauma and emergency settings, the concept of SDM has proven to be complex to apply and measure in practice (Woltz *et al.*, 2018). While in some medical decisions, time pressure is so high to jeopardize the survival of the patients, other diagnoses may leave hours or more before the treatment starts, allowing physicians enough time to explain to the patients the various options, leading to an informed and shared decision about the next clinical steps.

The recent investigation by Woltz and colleagues (2018) through a survey in the Netherlands depicts how trauma surgeons generally recognize SDM as valuable for good patient care. Still, several participants show an evident lack of understanding of what SDM implies, with difficulties in accomplishing it.

Starting from investigating the recent literature on SDM in trauma and emergency surgery settings, the paper presents a literature review to explore the barriers, facilitators, and knowledge translation dynamics of SDM in trauma and emergency surgery.

## **2. Methodology**

The paper employs a Structured Literature Review (SLR) approach, following the protocol developed by Massaro and colleagues (2016). SLRs offer a sound alternative to more "traditional" literature reviews such as systematic or bibliometric ones, as their findings stand more "defensible" and "replicable."

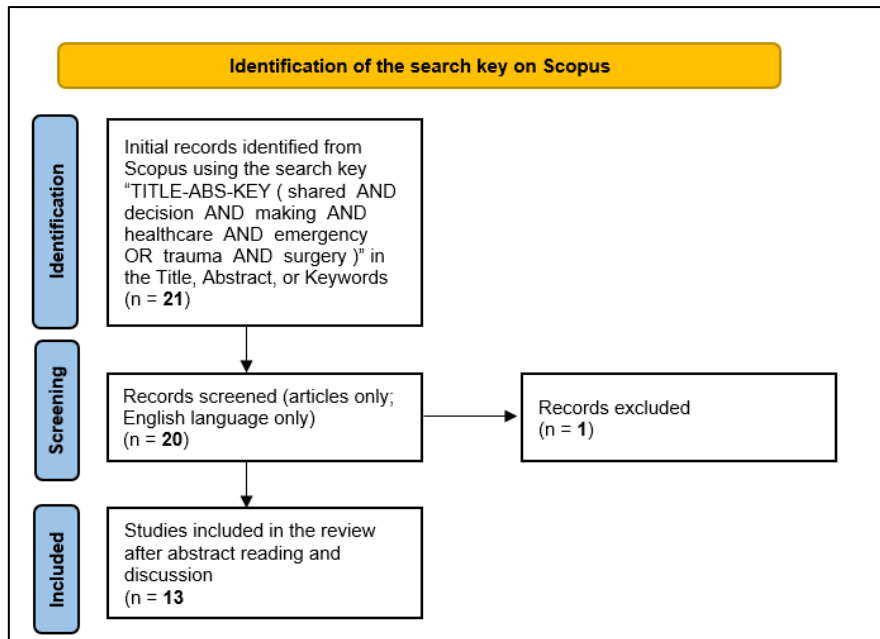
A first preliminary research protocol was determined among the research team to describe the investigation process to make it reliable and reproducible for further research. Three main research questions (RQs) were identified:

RQ 1: What are the main features of the literature on SDM in trauma and emergency surgery?

RQ 2: What are the most frequent issues and themes of such literature?

RQ 3: What may be the possible research avenues?

The selection of academic sources was made from Scopus, namely one of the most prominent research datasets. The Scopus search was performed on January 9th, 2022, as "shared AND decision AND making AND healthcare AND emergency OR trauma AND surgery" in the Title, Abstract, or Keywords, leading to 21 results. We decided to limit the search to articles written in English, deleting sources like books, book chapters, and conference proceedings. 20 papers were selected. Two researchers (FD and LC) read all abstracts to select only articles related to the analyzed topics. A discussion between the researchers allowed us to determine which papers fitted the research agenda and which did not. Following the manual selection, 13 articles met the criteria defined in the research protocol. The 13 works were downloaded and coded through Nvivo. Figure 1 summarizes the selection process, while Table 1 reports the articles' details, including authors, title, and journal.



**Figure 1:** The selection process according to the SLR protocol (Massaro, Dumay, *et al.*, 2016) and PRISMA (Liberati *et al.*, 2009)

**Table 1:** The papers included in the study

#	Year	Authors	Title	Source title	Reference
1	2021	Abbasgholizadeh Rahimi, S., Rodriguez, C., Croteau, J., Sadeghpour, A., Navali, A.-M., Légaré, F.	Continuing professional education of Iranian healthcare professionals in shared decision-making: lessons learned	BMC Health Services Research	(Abbasgholizadeh Rahimi <i>et al.</i> , 2021)
2	2021	Brown, T.T., Hurley, V.B., Rodriguez, H.P.	Association of patient engagement strategies with utilisation and spending for musculoskeletal problems in the USA: a cross-sectional analysis of Medicare patients and physician practices	BMJ Open	(Brown <i>et al.</i> , 2021)
3	2021	Thunnissen, F.M., Drager, L.D., Braak, B., Drenth, J.P.H., Van Laarhoven, C.J.H.M., Schers, H.J., De Reuver, P.R.	Healthcare utilisation of patients with cholecystolithiasis in primary care: A multipractice comparative analysis	BMJ Open	(Thunnissen <i>et al.</i> , 2021)
4	2021	Nieuwstraten, J.A., van Doorn, L.P., Gebhardt, W.A., Hamming, J.F.	Stakeholder values and preferences in lower limb amputation for no-option chronic limb threatening ischemia	Patient Preference and Adherence	(Nieuwstraten <i>et al.</i> , 2021)
5	2020	Prachand, V.N., Milner, R., Angelos, P., Posner, M.C., Fung, J.J., Agrawal, N., Jeevanandam, V., Matthews, J.B.	Medically Necessary, Time-Sensitive Procedures: Scoring System to Ethically and Efficiently Manage Resource Scarcity and Provider Risk During the COVID-19 Pandemic	Journal of the American College of Surgeons	(Prachand <i>et al.</i> , 2020)
6	2019	Newcomb, A.B., Allred, C., Grove, C., Newcomb, H., Mohess, D., Griffen, M.M., Dort, J.	Surgeon Communication and Family Understanding of Patient Prognosis in Critically Ill Surgical Patients: A Qualitative Investigation Informs Resident Training	Journal of Surgical Education	(Newcomb <i>et al.</i> , 2019)

#	Year	Authors	Title	Source title	Reference
7	2019	Bottle, A., Parikh, S., Aylin, P., Loeffler, M.	Risk factors for early revision after total hip and knee arthroplasty: National observational study from a surgeon and population perspective	PLoS ONE	(Bottle <i>et al.</i> , 2019)
8	2018	Heiss, K.F., Raval, M.V.	Patient engagement to enhance recovery for children undergoing surgery	Seminars in Pediatric Surgery	(Heiss and Raval, 2018)
9	2016	Schalkers, I., Parsons, C.S., Bunders, J.F., Dedding, C.	Health professionals' perspectives on children's and young people's participation in health care: A qualitative multihospital study	Journal of Clinical Nursing	(Schalkers <i>et al.</i> , 2016)
10	2015	Janssen, S.J., Teunis, T., Guitton, T.G., Ring, D., Spoor, A.B., Chauhan, A., et al.	Do surgeons treat their patients like they would treat themselves?	Clinical Orthopaedics and Related Research	(Janssen <i>et al.</i> , 2015)
11	2015	Tighe, P., Buckenmaier, C.C., Boezaart, A.P., Carr, D.B., Clark, L.L., Herring, A.A., Kent, M., Mackey, S., Mariano, E.R., Polomano, R.C., Reisfield, G.M.	Acute Pain Medicine in the United States: A Status Report	Pain Medicine (United States)	(Tighe <i>et al.</i> , 2015)
12	2014	Parmar, A.D., Coutin, M.D., Vargas, G.M., Tamirisa, N.P., Sheffield, K.M., Riall, T.S.	Cost-Effectiveness of Elective Laparoscopic Cholecystectomy Versus Observation in Older Patients Presenting with Mild Biliary Disease	Journal of Gastrointestinal Surgery	(Parmar <i>et al.</i> , 2014)
13	2013	Lee, J.K., Keam, B., An, A.R., Kim, T.M., Lee, S.-H., Kim, D.-W., Heo, D.S.	Surrogate decision-making in Korean patients with advanced cancer: A longitudinal study	Supportive Care in Cancer	(Lee <i>et al.</i> , 2013)

One vital step in developing an SLR is setting the framework of analysis. In our study, the nodes used in the coding process are mainly inspired by previous SLR papers and adapted to the specific field of investigation.

The first category relates to the Author type, differentiating among academics, practitioners, or both, as recommended by other studies (Dal Mas *et al.*, 2019). Although academic surgeons are usually engaged in clinical activities, we thought measuring the degree of collaboration with non-academic parties would be worth it.

The second category refers to the location where the study is conducted (Massaro *et al.*, 2015; Massaro, Handley, *et al.*, 2016) to understand if there are some underinvestigated areas.

Considering SLRs tailored to the healthcare sector (Dal Mas, Garcia-Perez, *et al.*, 2020), the following three categories attempt to map the sector type (public vs private vs general), the specific medical speciality, and the diagnosis or disease reported in the articles. Such nodes were managed according to an open coding approach, adding new children codes when found in the analyzed paper.

The category that follows is about the research method (Dal Mas *et al.*, 2019; Massaro *et al.*, 2015; Massaro, Handley, *et al.*, 2016) to see which research methodologies are mostly employed by the authors.

Other nodes contemplate the features of the topic under investigation, namely the presence (or not) of a definition of SDM, the decision aids and knowledge translation tools recommended, the stakeholders involved, the type of impact recognized, and the eventual presence of facilitators and barriers in the SDM process.

Each article included in the list was coded following the framework as mentioned above. A discussion between two of the researchers (FD and LC) followed the initial coding to arrive at the list and results reported in Table 2.

**Table 2:** Coding framework and results of the coding

Node name	Files	%
<b>01_ Author type</b>	13	
Scholars	10	76.92%
Both practitioners and scholars	2	15.38%
Practitioners	1	7.69%
<b>02_ Location of the study</b>	13	
USA	6	46.15%
The Netherlands	3	23.08%
Korea	1	7.69%
The UK	1	7.69%
Iran	1	7.69%
No specific location	1	7.69%
<b>03_ Sector type</b>	13	
Healthcare or surgery in general terms	7	53.85%
Public sector	6	46.15%
Private sector	0	0.00%
<b>04_ Healthcare sector</b>	13	
General surgery	6	46.15%
Orthopedics	4	30.77%
Surgical oncology	1	7.69%
Acute pain medicine	1	7.69%
General practice	1	7.69%
<b>05_ Type of disease</b>	13	
Hip and knee surgery	3	23.08%
Trauma surgery	2	15.38%
Pediatric surgery	2	15.38%
Cholecystolithiasis	2	15.38%
Poor prognosis in ICU	1	7.69%
Elective interventions	1	7.69%
Limb amputation for no option chronic ischemia	1	7.69%
Advanced cancer	1	7.69%
<b>06_ Research method</b>	13	
Qualitative semi structured interviews	3	23.08%
Other quantitative - scoring	2	15.38%
Retrospective analysis of registry data	2	15.38%
Quantitative cross sectional	2	15.38%
Expert opinion	1	7.69%
Narrative review	1	7.69%
Logistic regression	1	7.69%
Observational quantitative study	1	7.69%
<b>07_ Definition of shared decision making</b>	13	
No	11	84.62%
Yes	2	15.38%
<b>08_ Decision aids and knowledge translation tools</b>	13	
<i>Non-technical skills</i>	12	
Empathy	3	23.08%
High quality communication	3	23.08%
Upfront and open communication	3	23.08%
Multidisciplinary collaboration	3	23.08%
<i>Design elements</i>	5	
Videos	3	23.08%
Clinical vignette	2	15.38%
<i>Organizational and process tools</i>	3	
Checklist including daily family updating	2	15.38%
Patient and Family Handbooks	1	7.69%
<i>Scoring and clinical methods</i>	4	
Scoring methods and open access datasets	2	15.38%
Evidence based treatments	1	7.69%
Pain passport	1	7.69%

Node name	Files	%
<i>Human Resource-based methods</i>	2	
Facilitators, eg play specialists for children	1	7.69%
Counseling	1	7.69%
09_Type of stakeholders	13	
Patients	11	84.62%
Healthcare professionals	11	84.62%
Hospitals	7	53.85%
Families	4	30.77%
Caregivers	2	15.38%
Private pharma companies	1	7.69%
10_Type of impact	13	
Better clinical outcomes	5	38.46%
Manage expectation	4	30.77%
Limit surgery	4	30.77%
Better patient management	4	30.77%
Stimulating patient centric care	3	23.08%
Patient empowerment and coproduction	3	23.08%
Better hospital experience for patients and families	2	15.38%
Aligning patients preferences with treatment options	1	7.69%
Cost reduction	1	7.69%
According to ethics and moral norms	1	7.69%
11_SDM Facilitators	13	
Yes	7	53.85%
<i>Resource-based Tools</i>	11	
Availability of resources	3	23.08%
Managerial support	3	23.08%
Training	3	23.08%
Availability of data	1	7.69%
Availability of time	1	7.69%
<i>Non-technical skill-based Tools</i>	2	
Personal beliefs and values	1	7.69%
Patients and healthcare professionals' motivation	1	7.69%
<i>Process-based Tools</i>	2	
Scoring system	1	7.69%
Consultations and second opinions	1	7.69%
No	6	46.15%
12_SDM Barriers	13	
01_Yes	8	61.54%
<i>Non-technical skill-based Barriers</i>	10	
Misunderstanding between patients and professionals	3	23.08%
Fear of unnecessarily frightening patients	2	15.38%
Lack of multidisciplinary collaboration	2	15.38%
Cultural issues and mindsets	2	15.38%
Fear of leading to distrust	1	7.69%
<i>Resource-based Barriers</i>	9	
Time constrains	3	23.08%
High patient load	3	23.08%
Lack of studies and training	2	15.38%
Lack of sleep	1	7.69%
<i>Process-based Barriers</i>	1	
Previous negative experience	1	7.69%
<i>Situation-based Barriers</i>	2	
COVID pandemic	1	7.69%
Conflicts of interest eg pharma companies	1	7.69%
No	5	38.46%

### 3. Findings, insights, and critique

The following section aims at answering the following RQs:

RQ 1: What are the main features of the literature on SDM in trauma and emergency surgery?

RQ 2: What are the most frequent issues and themes of such literature?

### 3.1 Author type

Most of the papers are written by academics. Still, a couple of works were co-authored along with practitioners.

### 3.2 Location of the study

There are just a few locations mentioned in the selected articles. Interesting enough, almost half of the studies were conducted in the USA (46%) and three of them in the Netherlands (23%).

### 3.3 Sector type, healthcare sector, and type of disease

No studies are specifically conducted in the private sector. All articles report the experience of public hospitals, or they discuss the topic in general terms. Said that, all the papers refer to hospital settings, and the different types of healthcare services (being it national like in most European countries or private as in the USA) should be taken into account.

Regarding the specific specialities, most contributions were developed within the context of general surgery (6 articles, equal to 46% of the sample) and orthopedics (4 articles, 30% of the sample).

Concerning the type of disease, several are mentioned, although hip and knee surgery are reported in three research pieces (Abbasgholizadeh Rahimi *et al.*, 2021; Bottle *et al.*, 2019; Brown *et al.*, 2021).

### 3.4 Research methods

The sample shows a variety of different research methodologies. The most common one is represented by qualitative semi-structured interviews with three papers. Other methods include scoring, retrospective analysis of registry data, quantitative cross-sectional, expert opinions, narrative reviews, quantitative logistic regression, and quantitative observational studies.

### 3.5 Definition of SDM

Only two papers define SDM as a concept, while all the remaining pieces give its definition for granted. The following Table 3 reports the definitions provided by the authors.

**Table 3:** Definitions of SDM

Definition of SDM	Reference
Shared decision making (SDM) is a collaborative process in which patients and healthcare professionals make healthcare decisions based on the best available evidence and on patients' priorities	(Abbasgholizadeh Rahimi <i>et al.</i> , 2021, p. 2)
Exploring patient values and preferences (shared goal-setting)	(Nieuwstraten <i>et al.</i> , 2021, p. 1051)

### 3.6 Decision aids and knowledge translation tools

All the papers included in the sample report some decision aids and tools to support the connection and understanding between medical staff and patients, allowing the effective translation of knowledge. The decision aids and knowledge translation tools have been divided into five categories: non-technical skills, design elements, organizational and process tools, scoring and clinical methods, and human resource-based methods. In agreement with the recent literature (Dal Mas, Garcia-Perez, *et al.*, 2020), several studies (3 items each) recommend using empathy, high-quality communication, upfront and open communication, and multidisciplinary collaborations. In all, non-technical or soft skills (Dal Mas *et al.*, 2021; Yule and Smink, 2020) stand as central elements to facilitate the effective exchange of knowledge to allow the patients to understand and co-decide the treatment path. Other meaningful tools come from design elements (Dal Mas, Biancuzzi, *et al.*, 2020), including videos (3 items) and clinical vignettes (2 items), which proved to be particularly useful in professional education (Abbasgholizadeh Rahimi *et al.*, 2021). More formal and technical instruments are also mentioned, including checklists, scoring methods and open-access datasets, and patient and family handbooks.

### 3.7 Type of stakeholders

Besides the clinical staff and patients, other stakeholders are mentioned, including patients' families and caregivers and hospitals, as SDM can contribute to costs reductions (Brown *et al.*, 2021).

### 3.8 Type of impact

The articles mention several different types of impact that SDM can bring. The following Table 4 reports such effects with some examples grabbed from the sample.

**Table 4:** Type of impact

Type of impact	#	Reference	Example
Better clinical outcomes	5	(Tighe <i>et al.</i> , 2015, p. 2)	SDM can “facilitate and enhance the quality of patient recovery after surgery, illness, or trauma.”
Manage expectation	4	(Thunnissen <i>et al.</i> , 2021, p. 1)	“The mediocre outcome of cholecystectomy supports the need for better patient selection for surgery and to better inform patients in order to manage expectations.”
Limit surgery	4	(Parmar <i>et al.</i> , 2014, p. 1616)	“An individualized shared decision-making strategy based on these data can increase elective cholecystectomy rates in patients at high risk for recurrent symptoms and minimize unnecessary cholecystectomy for patients unlikely to benefit.”
Better patient management	4	(Heiss and Raval, 2018, p. 86)	SDM can facilitate “effective team function and focused oversight of patient flow through the system.”
Stimulating patient-centric care	3	(Brown <i>et al.</i> , 2021, p. 1)	SDM can “support the provision of patient- centred care.”
Patient empowerment and coproduction	3	(Janssen <i>et al.</i> , 2015, p. 3571)	SDM gives “patients more autonomy by letting them balance risks and benefits themselves.”
Better hospital experience for patients and families	2	(Newcomb <i>et al.</i> , 2019, p. e84)	“Family members’ descriptions of encounters with physicians suggest they exert significant influence on their experience of the hospital, stress level, and understanding of the patient’s condition.”
Aligning patients preferences with treatment options	1	(Brown <i>et al.</i> , 2021, p. 1)	SDM allows aligning “patients’ preferences with treatment options.”
Cost reduction	1	(Brown <i>et al.</i> , 2021, p. 1)	SDM allows potential reducing “spending.”
According to ethics and moral norms	1	(Abbasgholizadeh Rahimi <i>et al.</i> , 2021, p. 5)	Practising SDM is “highly acceptable and in accordance with [Iranian] moral values (moral norm).”

### 3.9 Facilitators

The facilitators reported in the selected articles have been divided into the following categories: resource-based tools, non-technical skill-based tools, and process-based tools. Half of the articles (7 items, 53% of the sample) reports the usefulness of some facilitators or enablers to enhance the SDM process. Among the most common ones, we can mention the availability of resources, managerial support, and training (3 items each). Other facilitators include the availability of data, personal beliefs and values, the presence of a scoring system, the availability of time, consultations and second opinions by colleagues, and motivation of both personnel and patients.

### 3.10 Barriers

The barriers found in the selected papers have been categorised as follows: non-technical skill-based barriers, resource-based barriers, process-based barriers, and situation-based barriers. Eight papers out of 13 (61%) mention the presence of barriers to effective SDM. Among the most common ones, we can report the misunderstanding between patients and professionals, time constraints in managing the communication, and high patient loads by physicians (3 items each). Other issues include the fear of unnecessarily frightening patients, the lack of multidisciplinary collaboration, the lack of studies and training, and cultural issues and mindsets (2 items each). Some papers also mention the lack of sleep by surgeons, previous negative experiences in discussing with the patients, the fear of leading to distrust in the relationship between medical doctors and patients, conflicts of interest (like with pharma companies) and the emergencies brought by the recent COVID-19 pandemic (Cobianchi *et al.*, 2020; Romani *et al.*, 2021) (1 item each).

## 4. Discussion and conclusions

This section aims to discuss the findings and reply to RQ 3: What may be the possible research avenues?



Our investigation underlines the importance of SDM in the modern patient-centric healthcare system, in which discussing with the patient stands as an ethical and moral duty for the physicians involved. Still, not all medical specialities seem suitable for SDM. In trauma and emergency surgery, multidisciplinary teams must take care of patients in challenging situations, with a lack of information and often no time or chance to engage the patient in the clinical decision-making process. In such circumstances, knowledge translation and sharing dynamics appear crucial (Cobianchi, Dal Mas, Massaro, Fugazzola, Catena, *et al.*, 2021). The recent literature (Woltz *et al.*, 2018) has underlined several lacks for trauma and emergency surgeons to employ SDM with their patients, even when the time or diagnosis would allow them to do so. The study conducted by Woltz and colleagues (2018) called for training to educate surgeons about what SDM entailed.

Our literature search according to the SLR protocol allowed us to find a limited number of articles published in the field. Interesting enough, even with a little sample, some interesting insights could be defined, opening up to future research avenues.

Most papers are authored by academic professionals, calling for more cooperation with clinicians outside the academic environment or university hospitals. Some countries like the USA and the Netherlands are investigated, while many more global areas do not report any practical experiences. The research methods vary. However, many articles employ qualitative methodologies, which seem more suitable for describing in-depth cases. The hospital setting appears to be the preferred ambience in which investigating and measuring the SDM dynamics. Still, just a few papers describe emergencies with little time to engage with the patients. That is why the majority of articles refer to orthopaedics, in which physicians have more time before starting surgical intervention or other clinical options.

The decision aids and knowledge translation tools defined in the selected papers lead to some fascinating findings. In accordance with the recent literature (Dal Mas *et al.*, 2021; Dal Mas, Garcia-Perez, *et al.*, 2020), soft or non-technical skills are crucial to engaging with the patients, despite the differences in terms of education, medical knowledge, and feelings. Still, even technical and visual tools are mentioned, like checklists, which would remind the clinical staff, including residents, to refer to the patient or the family/caregivers about the current conditions and progress (Newcomb *et al.*, 2019). Notably, such more technical tools like checklists and scores are little related to modern technologies. New research avenues should investigate how web-based applications and other high-tech means may support and facilitate the relationship between medical doctors and patients, even in emergency settings.

Among the impacts, in agreement with the findings of Woltz *et al.* (2018), SDM is recognized as a very relevant element in ensuring the best possible clinical outcome, the patient-centric philosophy, and the co-production dynamics. Savings and cost reductions for hospitals and the national healthcare system are also generated, as an in-depth discussion with the patient may avoid the surgical option, especially when the clinical results are uncertain or particularly risky.

The identification of facilitators and barriers is also helpful to both academics and practitioners. While training stands as the most recommended strategy, time and resources constraints limit the possibility of the medical doctor in charge to discuss profitably with the patient. When the patient- and workload is high, the chance to devote time to the single patient needing to choose among various clinical options is limited. Counselling may represent a good facilitator for physicians to learn how to translate knowledge for their patients to manage their expectations and guide them in their informed choice.

In the end, while SDM is desirable in a patient-centric scenario, knowledge translation dynamics appear still difficult in trauma emergency settings, and clinicians should be provided with enough knowledge and technical resources to meet such an ethical duty as much as possible. Empirical investigations and best practices are needed to study the phenomenon further, leading to practical implications.

Like all pieces of research, our paper has limitations. Although SLRs are among the most rigorous literature review methodologies, our sample is modest, and the choice of the keywords may have excluded some valuable contributions. Moreover, excluding sources like books, book chapters, conference proceedings, or peer-reviewed articles in languages different from English may be questionable. Other search keys could be employed to enlarge the analyzed sources and the final results.

## References

- Abbasgholizadeh Rahimi, S., Rodriguez, C., Croteau, J., Sadeghpour, A., Navali, A.M. and Légaré, F. (2021), "Continuing professional education of Iranian healthcare professionals in shared decision-making: lessons learned", *BMC Health Services Research*, BMC Health Services Research, Vol. 21 No. 1, pp. 1–9.
- Bottle, A., Parikh, S., Aylin, P. and Loeffler, M. (2019), "Risk factors for early revision after total hip and knee arthroplasty: National observational study from a surgeon and population perspective", *PLoS ONE*, Vol. 14 No. 4, pp. 1–15.
- Brown, T.T., Hurley, V.B. and Rodriguez, H.P. (2021), "Association of patient engagement strategies with utilisation and spending for musculoskeletal problems in the USA: a cross-sectional analysis of Medicare patients and physician practices", *BMJ Open*, Vol. 11 No. 11, p. e053121.
- Cobianchi, L., Dal Mas, F., Massaro, M., Fugazzola, P., Catena, F. and Ansaloni, L. (2021), "Knowledge Management and Dynamics as perceived by Emergency Surgery Teams: a quantitative study", in Garcia-Perez, A. and Simkin, L. (Eds.), *Proceedings of the 22nd European Conference on Knowledge Management - ECKM2021*, Academic Conferences & Publishing International Ltd., Coventry, UK, 2-3 September 2021, pp. 217–224.
- Cobianchi, L., Dal Mas, F., Massaro, M., Fugazzola, P., Coccolini, F., Kluger, Y., Leppäniemi, A., et al. (2021), "Team dynamics in emergency surgery teams: results from a first international survey", *World Journal of Emergency Surgery*, Vol. 16, p. 47.
- Cobianchi, L., Pugliese, L., Peloso, A., Dal Mas, F. and Angelos, P. (2020), "To a New Normal: Surgery and COVID-19 during the Transition Phase", *Annals of Surgery*, Vol. 272, pp. e49–e51.
- Dal Mas, F., Bagarotto, E.M. and Cobianchi, L. (2021), "Soft Skills effects on Knowledge Translation in healthcare. Evidence from the field", in Lepeley, M.T., Beutell, N., Abarca, N. and Majluf, N. (Eds.), *Soft Skills for Human Centered Management and Global Sustainability*, Routledge, New York, pp. 95–109.
- Dal Mas, F., Biancuzzi, H., Massaro, M. and Miceli, L. (2020), "Adopting a knowledge translation approach in healthcare co-production. A case study.", *Management Decision*, Vol. 58 No. 9, pp. 1841–1862.
- Dal Mas, F., Garcia-Perez, A., Sousa, M.J., Lopes da Costa, R. and Cobianchi, L. (2020), "Knowledge Translation in the Healthcare Sector. A Structured Literature Review", *Electronic Journal Of Knowledge Management*, Vol. 18 No. 3, pp. 198–211.
- Dal Mas, F., Massaro, M., Lombardi, R. and Garlatti, A. (2019), "From Output to Outcome Measures in the Public Sector. A Structured Literature Review", *International Journal of Organizational Analysis*, Vol. 27 No. 5, pp. 1631–1656.
- Gibbon, S. (2011), "Family medicine, 'La Herencia' and breast cancer; understanding the (dis)continuities of predictive genetics in Cuba", *Social Science & Medicine*, Vol. 72, pp. 1784–1792.
- Graham, I.D., Logan, J., Harrison, M.B., Straus, S.E., Tetroe, J., Caswell, W. and Robinson, N. (2006), "Lost in knowledge translation: Time for a map?", *Journal of Continuing Education in the Health Professions*, Vol. 26 No. 1, pp. 13–24.
- Heiss, K.F. and Raval, M. V. (2018), "Patient engagement to enhance recovery for children undergoing surgery", *Seminars in Pediatric Surgery*, Elsevier, Vol. 27 No. 2, pp. 86–91.
- Janssen, S.J., Teunis, T., Guitton, T.G., Ring, D., Spoor, A.B., Chauhan, A., Shafritz, A.B., et al. (2015), "Do surgeons treat their patients like they would treat themselves?", *Clinical Orthopaedics and Related Research*, Springer US, Vol. 473 No. 11, pp. 3564–3572.
- Lee, J.K., Keam, B., An, A.R., Kim, T.M., Lee, S.H., Kim, D.W. and Heo, D.S. (2013), "Surrogate decision-making in Korean patients with advanced cancer: A longitudinal study", *Supportive Care in Cancer*, Vol. 21 No. 1, pp. 183–190.
- Lemire, N., Souffez, K. and Laurendeau, M.C. (2013), *Facilitating a Knowledge Translation Process. Knowledge review and facilitation tool*, Institut Publique de Santé du Quebec, Quebec.
- Lepeley, M.T. (2021), "Soft Skills: The language of Human Centered Management", in Lepeley, M.T., Beutell, N., Abarca, N. and Majluf, N. (Eds.), *Soft Skills for Human Centered Management and Global Sustainability*, Routledge, London.
- Liberati, A., Altman, D.G., Tetzlaff, J., Mulrow, C., Gøtzsche, P.C., Ioannidis, J.P.A., Clarke, M., et al. (2009), "The PRISMA statement for reporting systematic reviews and meta-analyses of studies that evaluate healthcare interventions: explanation and elaboration", *BMJ*, BMJ Publishing Group Ltd, Vol. 339, doi:10.1136/bmj.b2700.
- Massaro, M., Dumay, J. and Garlatti, A. (2015), "Public sector knowledge management: A structured literature review", *Journal of Knowledge Management*, Vol. 19 No. 3, pp. 530–558.
- Massaro, M., Dumay, J.C. and Guthrie, J. (2016), "On the shoulders of giants: Undertaking a structured literature review in accounting", *Accounting, Auditing and Accountability Journal*, Vol. 29 No. 5, pp. 767–901.
- Massaro, M., Handley, K., Bagnoli, C. and Dumay, J. (2016), "Knowledge Management in Small and Medium Enterprises. A structured literature review", *Journal of Knowledge Management*, Vol. 20 No. 2, pp. 258–291.
- Mathijssen, E.G.E., Van Den Bemt, B.J.F., Wielsma, S., Van Den Hoogen, F.H.J. and Vriesevink, J.E. (2020), "Exploring healthcare professionals' knowledge, attitudes and experiences of shared decision making in rheumatology", *RMD Open*, Vol. 6 No. 1, pp. 1–9.
- Newcomb, A.B., Allred, C., Grove, C., Newcomb, H., Mohess, D., Griffen, M.M. and Dort, J. (2019), "Surgeon Communication and Family Understanding of Patient Prognosis in Critically Ill Surgical Patients: A Qualitative Investigation Informs Resident Training", *Journal of Surgical Education*, Elsevier Inc., Vol. 76 No. 6, pp. e77–e91.
- Nieuwstraten, J.A., van Doorn, L.P., Gebhardt, W.A. and Hamming, J.F. (2021), "Stakeholder values and preferences in lower limb amputation for no-option chronic limb threatening ischemia", *Patient Preference and Adherence*, Vol. 15 No. May, pp. 1051–1059.

- Parmar, A.D., Coutin, M.D., Vargas, G.M., Tamirisa, N.P., Sheffield, K.M. and Riall, T.S. (2014), "Cost-Effectiveness of Elective Laparoscopic Cholecystectomy Versus Observation in Older Patients Presenting with Mild Biliary Disease", *Journal of Gastrointestinal Surgery*, Vol. 18 No. 9, pp. 1616–1622.
- Prachand, V.N., Milner, R., Angelos, P., Posner, M.C., Fung, J.J., Agrawal, N., Jeevanandam, V., et al. (2020), "Medically Necessary, Time-Sensitive Procedures: Scoring System to Ethically and Efficiently Manage Resource Scarcity and Provider Risk During the COVID-19 Pandemic", *Journal of the American College of Surgeons*, Vol. 231 No. 2, pp. 281–288.
- Romani, G., Dal Mas, F., Massaro, M., Cobiauchi, L., Modenese, M., Barcellini, A., Ricciardi, W., et al. (2021), "Population Health Strategies to Support Hospital and Intensive Care Unit Resiliency During the COVID-19 Pandemic: The Italian Experience", *Population Health Management*, Vol. 24 No. 2, pp. 174–181.
- Schalkers, I., Parsons, C.S., Bunders, J.F. and Dedding, C. (2016), "Health professionals' perspectives on children's and young people's participation in health care: A qualitative multihospital study", *Journal of Clinical Nursing*, Vol. 25 No. 7–8, pp. 1035–1044.
- Stahel, P.F., Cobiauchi, L., Dal Mas, F., Paterson-Brown, S., Sakakushev, B.E., Nguyen, C., Fraga, G.P., et al. (2022), "The role of teamwork and non-technical skills for improving emergency surgical outcomes: an international perspective", *Patient Safety in Surgery*, BioMed Central, Vol. 16 No. 1, pp. 1–10.
- Thunnissen, F.M., Drager, L.D., Braak, B., Drenth, J.P.H., Van Laarhoven, C.J.H.M., Schers, H.J. and De Reuver, P.R. (2021), "Healthcare utilisation of patients with cholecystolithiasis in primary care: A multipractice comparative analysis", *BMJ Open*, Vol. 11 No. 11, pp. 1–8.
- Tighe, P., Buckenmaier, C.C., Boezaart, A.P., Carr, D.B., Clark, L.L., Herring, A.A., Kent, M., et al. (2015), "Acute Pain Medicine in the United States: A Status Report", *Pain Medicine (United States)*, Vol. 16 No. 9, pp. 1806–1826.
- Woltz, S., Krijnen, P., Pieterse, A.H. and Schipper, I.B. (2018), "Surgeons' perspective on shared decision making in trauma surgery. A national survey", *Patient Education and Counseling*, Elsevier Ireland Ltd, Vol. 101 No. 10, pp. 1748–1752.
- Yule, S. and Smink, D.S. (2020), "Non-Technical Skill Countermeasures for Pandemic Response", *Annals of Surgery*, Vol. 272 No. 3, pp. e213–e215.