Challenges and potential improvements in hospital patient flow: the contribution of frontline, top and middle management professionals

Abstract

Purpose – This study aims to describe and understand the contributions of frontline, middle and top management healthcare professionals in detecting areas of potential improvement in hospital patient flow and proposing solutions.

Design/methodology/approach – This is a qualitative interview study. Semi-structured interviews were conducted with twenty-two professionals in the Orthopedic Department of a 250-bed academic teaching hospital. Data were analyzed through a thematic framework analytical approach by using an a priori framework. The Consolidated Criteria for Reporting Qualitative (COREQ) checklist for qualitative studies was followed.

Findings – When dealing with a hospital-wide process, the involvement of all professionals, including non-health professionals, can reveal priority areas for improvement and for services integration. The improvements identified by the professionals largely focus on covering major gaps detected in the technical and administrative quality.

Research limitations/implications – This study focused on the professional viewpoint and the connections between services and further studies should explore the role of patient involvement. The study design could limit the generalizability of findings.

Practical implications – Improving high quality, efficient hospital patient flow cannot be accomplished without learning the perspective of the healthcare professionals on the process of service delivery.

Originality/value – Few qualitative studies explore professionals' perspectives on patient needs in hospital flow management. This study provides insights into what produces value for the patient within a complex process by analyzing the contribution of professionals from their particular role in the organization.

Key-words hospital patient flow improvement, quality improvement, front line professionals' involvement, middle managers' involvement, top managers' involvement.

Paper type Research paper

Introduction

The increasing demand for health care services leads organizations to face critical tensions between cost saving, services improvement and equity of access, while maintaining the central focus on increasing value for patients. In the hospital setting, the management of patient flow is a complex key business process which impacts both on hospital productivity and on patient outcomes (Jack & Powers, 2008; Crilly *et al*., 2015; Kane *et al*., 2016; Winasti *et al*., 2018). While ensuring that each patient arrives at each point of care as needed, the hospital has to effectively balance the increasing demands of an unknown and variable volume of patients with the hospital resources available (Litvak, 2010; Eriksson, 2017). Therefore, improving hospital patient flow has become a policy priority where strategic and operational hospital goals are achieved. On one hand, hospitals can increase levels of productivity, clinical outcomes, and patient safety through the effective use of resources (i.e. beds, operating theaters, availability of specialized professionals) (Kriegel *et al*., 2015; Elliott *et al.,* 2015; Borenstein *et al.,* 2016). On the other, hospitals can improve patient satisfaction and patient experience by focusing on the individual patient journey (Lutze *et al.,* 2014; Ponsignon *et al.,* 2018).

A key requirement for healthcare service quality improvement is to understand the circumstances surrounding the patient's value creation process (Batalden & Davidoff, 2007). Indeed, the way in which the work is organized can have an impact on the productivity and quality of the service provided (Broekhuis *et al.,* 2009). Studies emphasize that first-hand experience represents an important source of knowledge for a better design of a service, process or product (Steen *et al.,* 2011; Needleman *et al.,* 2016). Since most of the events that make up a service are invisible to the patient, professionals are better placed to detect quality gaps in the process (Locock, 2003; Wong *et al.,* 2011). For example, the patient does not see the steps needed to obtain the right surgical instruments for the operation, but experiences an unnecessary waiting time in his journey if any gaps occur. However, in a hospital-wide process, the integration of several services and the high number of professionals involved at all levels of the organization makes it difficult to identify whether and how important patient needs are fulfilled.

This study examined the lived experience of orthopedic patients with elective total hip or knee replacement from the point of view of frontline, top and middle management hospital professionals. The study is a part of a larger research and development project that aims to improve hospital patient flow by involving patients, professionals and researchers. This article focuses on what kind of patient needs and quality improvement solutions may be detected by healthcare professionals.

Background

Hospital patient flow can be defined as "how hospitals transfer patients between nursing units, and it is influenced by the levels of care required and the severity of patients' conditions" (Hendrich *et al.,* 2004). Patient flows are inherently subject to high variability, depending on the patient inflow at a given time, the nature of patients' needs, responses to treatment, and the state of medical knowledge (Bohmer, 2005).

Currently, there is a lack of standard terms to define hospital patient flow performance, because of its intersection with other concepts such as hospital capacity management, bed management and demand variation management. Dagger *et al.* (2007) created a model in order to clearly link patient satisfaction and service quality. In this model, patients' perceptions of quality are based on four dimensions: interpersonal quality, defined as the relationship developed between a service provider and a user; technical quality, defined as the outcomes achieved and the technical competence of a service provider; environmental quality, defined as the environmental features that shape consumer service perceptions; and administrative quality, defined as the service elements that facilitate the production of a core service while adding value to a customer's use of the service. In a recent study, Gustavsson *et al.* (2016) add two more dimensions: family quality – the ability for the family to stay together; and involvement quality – the ability to handle the situation in terms of responsibility and capability.

Some important factors have to be considered when improving hospital patient flow. First, the person who knows most about the patient's perspective is necessarily someone who enters into a relationship with him (Locock, 2003). Second, the traditional approach of inviting contributions from each medical or surgical division may not reveal disconnections between the stages of the process (Ben-Tovim *et al.,* 2008). Finally, this kind of cross-functional process, using a large amount of the hospital's human and technological resources, has to be managed at macro level by middle and top managers (Castillo *et al.,*2011; Jweinat *et al.,* 2013; Olsson *et al.,* 2017). Consequently, all the actors in the frontline, middle and top management should be able to capture important aspects of the quality of the service offered.

Many studies have emphasized the importance of involving the key representative professionals in patient flow improvement (Locock, 2003; Kriegel *et al.,*2015; Winasti, 2018). However, little is known about what contributions professionals can give as a result of the specific position they each hold in the organization. In particular, few studies consider which professionals to involve and how to involve them, at various levels of the organization, when studying a hospital-wide process.

Therefore, the aim of this study is to understand the contributions of professionals in identifying areas for improvement in hospital patient flow. In particular, this study seeks to answer the following questions. Which quality dimensions of healthcare services do different professionals identify in regard to improving patient flow? In which ways can frontline, middle or top management professionals help to identify solutions for improving patient flow?

Methods

Design and setting

This study was focused on data from a quality improvement project undertaken in the Orthopedic Department of a 250-bed Italian academic teaching hospital. The purpose of the whole project was to capture

patients' experiences and needs in order to improve the hospital flow of orthopedic patients, while this study focuses mainly on the contribution of the healthcare professionals involved.

As no literature was found concerning the challenges and potential improvements of the hospital patient flow process in relation to the roles or functions of the professionals within the organization, a qualitative research design with a phenomenological-hermeneutic approach was chosen (Braun, 2013). Accordingly, the case was chosen as a purposive sample (Flick, 2009). The Consolidated Criteria for Reporting Qualitative Research - COREQ checklist was used as a guideline to report the study data (Tong *et al.,* 2007) (See Supplementary File 1).

Patient flow analysis was limited to scheduled patients treated surgically for total hip or knee replacement. Urgently admitted patients were excluded due to the different clinical path they followed. Consistently with the desire to analyze patient flow from the patient's perspective, the unit of analysis was the hospital patient journey starting from the first outpatient visit until the first follow-up visit.

The Orthopedic Department undertakes 1500 admissions per year in standard procedure (day surgery excluded) of which about 700 are for hip or knee replacement. It consists of two units located in two different multidisciplinary wards of the hospital, with a total of 22 beds. The management of hospital beds is centralized and entrusted to a team of nurses who, through administrative staff, operate patient calls, hospitalization and assignment of beds according to the complexity of care and bed availability in each ward.

Patients undergo a prehospitalization process about 2 months before admission, where the clinical examinations necessary for surgery are performed. They may be admitted on the day of the surgery or on the previous day according to the clinical examinations to be completed or re-evaluated. Patients receive surgery in two different surgery blocks according to the overall surgery plan for the hospital. The surgery blocks are located on two different floors of the Hospital with a total of 10 operating theaters. The average stay is 4 days in the absence of complications, and then the patient is transferred to rehabilitation. The Hospital includes a 20-bed rehabilitation located in a separate building where patients are transferred based on bed availability.

Participants

Between September 2016 and April 2017 a convenience sample of 22 key health professionals were selected by the first and the third author. The selection criteria were: hospital employees willing to participate in and contribute to the project; able to give informed consent for participation in the study; able to communicate in Italian; and having at least two years' experience in the hospital. The corresponding author informed the professionals of the study via e-mail and invited participation. No employee refused the invitation.

Frontline professionals were selected among those employees who directly interact with patients during a total hip or knee replacement surgery. Middle management professionals were selected following the

definition offered by Belasen & Belasen (2016), as those managers who "convert strategic goals into actionable improvement plans at the department or work unit level, engage employees in safety and quality assurance efforts (…), and identify processes for continuous improvement". Accordingly, 3 physicians, 5 nurses, 3 admissions officers, 2 patient transporters, 4 head nurses and 2 nurse bed managers were asked to participate. In addition, a member of the Medical Management Team, the Hospital Managing Director and the Hospital Clinical Director were included.

Data collection

Professionals participated in face-to-face open interviews lasting 30–45 min. At the time of the initial call, participants were informed of the aims of the study and the conditions of participation, and given guarantees of confidentiality. They each signed a consent form. The interviews took place in identified and isolated hospital rooms where the interviewees could break away from ordinary hospital clinical activity. The first and third author led the interviews, with a trained nursing student present to note any events that occurred during the interview. The authors had a nursing background and knew the professionals because they worked in the same hospital with managerial functions. The authors did not play roles in delivery of care. Their interests in the research topic were motivated by the desire to conduct the research project and to improve the hospital patient flow within the organization. Any possibility of coercion was minimized by guaranteeing data anonymity and by requesting voluntary participation in the study.

The interviews were semi-structured in nature and were prepared by the whole research group, which drew up a few main open questions in order to leave the interviewees free to narrate their experience, and to facilitate broad answers. Questions aimed to gain an understanding of the main steps and gaps in the orthopedic patients flow from the patient perspective, and to identify which improvements each participant could suggest. Data saturation was achieved by considering the degree to which new data repeat what was expressed in previous data.

All data were treated as confidential. Physical data was stored under lock and key at the hospital and digital data was password-protected and stored in professionally maintained servers.

Research ethics approvals were obtained from the Hospital Ethics Committee and written informed consent from all participants was obtained and stored.

Data Analysis

Interview findings were analyzed by the first author using a thematic framework analytical approach (Pope *et al.,* 2000; Gale *et al.,* 2013) in which the framework was given a priori with reference to the work of Dagger and Gustavsson on quality dimensions of health services (Dagger *et al.,* 2007; Gustavsson *et al.,* 2016). This approach was chosen as the project had specific issues to explore, but also aimed to leave space to

discover any unexpected issues of the participants' experience or the way they assigned meaning to phenomena (Gale *et al.,* 2013).

The interviews were audio-recorded and transcribed verbatim by a trained nursing student. After familiarization by reading the transcripts by the first author, data were coded and transferred to an Excel spreadsheet database to systematize them and for the subsequent analysis. During the analysis process, data were coded in Italian and then abstracted and summarized. In particular, the units of meaning (what was said) were reflected in units of significance (what the texts were talking about) from which the key themes emerged (Table I). Each theme relating to the quality of the service and to possible improvements was subsequently classified in the quality dimensions defined by Gustavsson *et al.* (2016) (Tables I-II).

Insert Table I about here.

Insert Table II about here.

Once all the data had been coded using this analytical framework, the data was summarized in a matrix for each theme using Microsoft Excel. Improvements identified by professionals were classified based on their applicability at unit, departmental and organizational level.

The main quotations reported in this work were selected depending on how illustrative the quotation was in relation to the theme.

Results

Between September 2016 and April 2017, 22 professionals were invited to participate and all agreed. Professionals ranged in age from 29–61 years with an average age of 38.2 years and average work experience of 10.3 years. The main characteristics of each participant are reported in the Table III.

Insert Table III about here.

Detecting quality gaps in a cross-functional process

By asking professionals to take the patient's perspective over and above the provider's perspective, it is possible to map the entire journey as experienced by the patient. In the patient journey under study, seven main phases are identified (Figure 1). The whole process is composed of more than thirty-five consecutive and closely interconnected steps, and the correct execution of each step affects both the patient journey and the daily work of each service.

Insert Figure 1 about here.

Frontline professionals accurately describe the steps in which they come into contact with the patient or for which they are responsible; they describe the main phases of the whole process; but their reporting on all the steps that the patient has to traverse is only partial. In some cases they are able to report steps antecedent to or immediately after the segment of the process in which they are involved (Table IV). For

example, physicians focus on the steps needed for the patient's arrival in the operating theater, but they do not mention the patient telephone call at home for admission by the administrative office, or the transfer from the admission office to the inpatient unit on the day of admission. Similarly, nurses clearly describe all the steps related to admission and stay in the ward, but they do not report on when the patient is called for admission, what happens when the patient enters the hospital or what happens when he or she is transferred to the Rehabilitation Unit.

Insert Table IV about here.

The interviewees described different gaps occurring in the course of the whole process and involving almost all the quality dimensions. Most of them refer to administrative quality and technical quality.

Among the elements that make up administrative quality, gaps are pointed out in the operations and in the timeline. The lack of clear indications to the patient on where to go after administrative admission, the delay in transporting patients to the operating theater, the cancellation of surgery due to accumulation of delays in the management of the operating theater, impact both the work of the professionals and the quality of the service offered to the patient. For example, the time of the patient's entry into the hospital is critical both for the patient and for the operating theater. From one side, the patient experiences anxiety about the surgery and seems not to understand what to do. From the other, those working in the operating theater would like to have patients always immediately ready for surgery to avoid delays in operating schedules.

"It often happens that patients do not know where they are, what they can or cannot touch, who they can ask for help: 'Who is he?' 'Isn't he?', 'Who is that other person going around?', (…). Beyond that, there is the great fear that the patient faces ... about the surgery. So they begin to ask to you, as soon as they arrive 'When will I have the operation?', 'So what will happen to me?', 'When I get home I'll need help. Will I have to rely on my family or will you offer me assistance?'" (Nurse 1).

Middle management professionals mainly emphasize gaps in timeliness resulting in waits without added value for the patient. For example, the admission of patients when no bed is yet available in the ward, or delays in operating theater management, result in unnecessary waiting for the patient.

"The difficulty is that in the morning the elderly, if they arrive early at seven, in short, this ... wait outside the ward, to prepare the bed, which physically is never free, so leaving them out of the ward is a bit unpleasant" (Head Nurse 3).

Even from the point of view of an orthopedist, the management of the operating theater may significantly impact on the quality perceived by the patient.

"Ten minutes there, ten minutes there, ten minutes there, and then you get to half past six in the evening and the operating theater management staff says: 'We can't perform another surgery'. The patient feels this, because he has been fasting from midnight to half past six in the evening, ... with the anxiety of having the operation and then you tell him at half past six that ... you can't have the surgery!" (Orthopedist 2).

Similarly, a head nurse reports the consequences of delays in transporting patients to radiology.

"The day after surgery, you suspend the pain therapy, the infusion therapy or any other therapy for these patients and they go down with the bed for the X-Ray (...). The patient is taken down, waits down there. It's cold, or it's hot, with the bed exposed, stuck in the corridor. I have never followed the path myself, but I can imagine it because I know radiology. Then while the radiology department calls you back, maybe the patient waits twenty minutes. So between the time of being called to go down and getting back, an hour and a half passes. In this way the patient suffers everything" (Head Nurse 1).

Professionals detect important areas for improvement in relation to technical quality. In particular, almost all frontline professionals report a lack of patient information and education. This is more evident when patients are admitted to the hospital: they arrive in the ward and do not seem aware of what they will need for the surgery and what will happen during the whole hospitalization period.

"For some elderly patients, and patients who have to have a prosthesis are elderly, maybe sometimes there is a bit of confusion (...). At the time of the prehospitalization visit the patient is told, 'Look, then, you will have to come to the transfusion center' (...); but at the time of admission it often happens that they tell us 'I should come and do this thing, but when, and why?' (Admissions Officer 1).

"Out of ten who are admitted, six don't even know what the compression or surgical stockings are, or the need for transfer to rehab after their hospitalization. You go and open their bags and they have flip-flops, slippers, pants, jeans – that, in short, for us then after the transfer becomes really complicated" (Nurse 3).

Middle managers mainly focus on everything related to taking care of the patient and his or her family members if nurses are not available to welcome patients when they enter the ward; lack of supervision when the patient is waiting in radiology to perform post-operative radiography; difficulties in communication between operating theater and ward which prevents them from responding to family members asking about patients' condition.

"The relatives are worried, because the patient doesn't return, because they are not clear about what steps take place from the beginning of anesthesia, to reawakening. We are called only when the patient has finished the surgery and we have to go and bring him back from the operating theater; therefore also there is little communication with the operating theater, to tell you "Look, everything is ok". Often relatives ask us: "But can you call them?" ... but physically we can't, and in any case ... colleagues don't give you much explanation" (Head Nurse 3).

One of the steps most frequently perceived as critical is that of the prehospitalization procedure. Orthopedists frequently mentioned a lack of coordination of the service as well as the need to make an overall assessment of the patient.

"It shouldn't be this way, but in fact, I recognize that maybe we have little global vision of the patient, our vision is very specialized; so, sometimes, it turns out more difficult to go and evaluate something on the first

visit; when we see that there is serious arthrosis of a knee ... maybe we are unable to see that the patient has a chronic obstructive pulmonary disease " (Orthopedist 2).

A member of the Medical Management Team reports how patients risk being treated like cogs in a machine, because there is no time to explain to them what they would need to know.

"Actually, the indications you receive when you are told about the need of surgery and all the subsequent steps are like a machine gear, as a patient you are told: 'You have to do this', rather than explaining the whole path the patient will have to follow. And therefore it is like saying: 'Yes I will have surgery to put in a knee prosthesis, and that's it". You come, you perform the prehospitalization, you are left to yourself; after that you are called for hospital admission; you are admitted; and you feel abandoned, all the same" (Medical Management Team member).

This issue is also reported by one of the Hospital Directors, because of the impact both on costs and on the patient.

Another director highlights how the study of the prehospitalization path should consider that the patient has difficulty in mobilizing.

"Certainly, it is not optimal for patients with osteoarticular pathologies to move a lot inside the hospital during the prehospitalization process (...). Generally, patients who come for a hip or knee replacement, their hip or knee is painful, they have to have an operation because they are desperate, it hurts so badly that they no longer walk; the less they move, the happier they are. It is true that we have escalators, a lift, a wheelchair, etc., but people do not always take advantage of it" (Hospital Clinical Director).

With regard to the quality of the hospital surroundings, professionals also detect some gaps that affect the quality perceived by patients. Directions within the hospital, and the mixture of in-patients and outpatients in the radiology waiting room, are issues captured by frontline professionals.

"Orienting yourself, for those unfamiliar with the hospital, is quite complicated. For us who live here every day it is easy. But I admit that by putting ourselves in the patients' shoes, we can understand that they are already scared, the doors are opened and a world opens up" (Admissions Officer 3).

Micro and macro-system solutions for improvement

Despite their different roles, the solutions proposed by health professionals converge in a patient-oriented focus. Table V shows solutions proposed at the unit, department and hospital level regardless of the position that professionals have within the organization. However, each professional attributes a different reason to the need for possible solutions with reference to what they see of the patients.

Insert Table V about here.

For example, regarding administrative quality, the Hospital Managing Director explains how important it is to explain the reasons for waiting under any circumstances, given that in managing a complex process it is difficult to avoid delays. *"When dealing with an emotional component, time and communication are certainly two essential factors; so I can also make patients wait; however, I do it by explaining to them why they have to wait, because of programming times, waiting lists, emergencies; and also by putting things in a positive way" (Hospital Managing Director).*

All of the professionals suggest ways to improve operational efficiency in order to affect the quality perceived by the patient. Frontline professionals report the need to improve management at the hospital level of everything that takes place before admission, such as the outpatient booking or the waiting list management. An admissions officer points out how receiving multiple telephone calls from different staff members before admission, may confuse the patient.

The use of an IT communication system for managing patient transport is also identified as a way of reducing patient waiting times. Other solutions proposed to improve administrative quality have to be implemented at departmental level. Some of these are planning hospitalization according to the time of surgery, and spacing out the entry of incoming patients to decrease patient waiting; scheduling the elderly patients first, to ensure that their post-operative hours are during the day and reduce the risk of patient deterioration during the night; taking an X-ray in the operating room immediately after surgery and thus avoiding unnecessary transfer of the patient from the ward to the radiology department the next day.

In accordance with the gaps identified, many solutions are also offered to improve patient information and education, in the category of technical quality improvement. However, awareness that the patient experiences anxiety on the day of the surgery, leads professionals to ask themselves what is the best moment to inform and educate the patient successfully. The nurses suggest educating the patient during the first outpatient visit, possibly with a dedicated nurse, and sending the patient written information material. An orthopedist proposes the use of audiovisuals and a meeting with the physiotherapist before admission.

All these interventions can be carried out mainly at a department level and by involving different hospital services. However, some small but significant interventions at the level of the operating unit can improve the patient experience. For example, a nurse emphasizes how a simple reading of the therapy by the doctor together with the patient, can help the patient understand better what he or she will have to do after

discharge. A head nurse emphasizes how at the time of admission a better explanation of the physical path the patient has to follow within the hospital, may help to reduce the patient's anxiety.

No action was suggested by professionals to improve environmental and involvement quality.

Discussion

In this qualitative study, front line, middle management and top management professionals were involved in a wide-ranging project to study possible improvements to the hospital patient flow of orthopedic patients undergoing total hip or knee replacement surgery. The patient journey is a useful perspective from which to learn about the patient experience, since it consists of all the interactions the patient has with the provider across the continuum of care (Wolf *et al.,* 2014). However, when interviewing each professional from this perspective, a lack of knowledge of the whole process as experienced by the patient is observed. This confirms how the professionals focus on the piece of the process they are responsible for, rarely considering the other hospital services that patients have to go through (Ben-Tovim *et al.,* 2008). The inclusion of multidisciplinary, cross-continuum perspectives facilitated an understanding of the whole process and identified major challenges in improving a cross-hospital process.

Traditionally, processes that can be physically and/or temporally separated from the customer (back-office) are distinct from the processes that are performed when the customer is present (front-office). However, the way in which the work is performed in the back office significantly affects the quality of the service perceived by the patient in the front-office (Broekhuis *et al.,* 2009). In the patient journey studied in this study, many gaps, both in administrative quality and in technical quality, occur in components of the process that are invisible to the patient (i.e. the organization of the patient's stay, the preparation of the operating theater, the assignment of the bed) and under the eyes of those who work in the field. These gaps result in a lower quality perceived by the patient that can only partially be covered by the relationship between patient and professionals. By involving professionals with different backgrounds it is possible to understand what happens behind the scenes of a complex process and to identify gaps in the patient's journey under the lens of the distinctive characteristic of each professional's role. In this way it is possible to identify, for example, that important waiting times are not only those that the patient experiences between prehospitalization and hospitalization, but also when entering the ward or after performing radiology.

Multidisciplinary does not necessarily mean conflicting solutions. For example, the need to better educate and inform the patient before surgery is one of the main issues raised by the professionals. However, each professional enriches the reason for the need of improvement by highlighting how this impacts on the patient from his or her own professional perspective. In this way, admissions officers highlight the benefit to the patient in receiving less fragmented information; nurses aim to reduce the patient's lack of awareness of what will happen during hospitalization; while physicians are more focused on getting the patient the right clinical information during prehospitalization. Furthermore, converging solutions have emerged to reduce

waiting times and to improve operational efficiency for the benefit of the patient. These results show how when dealing with a hospital-wide process, the involvement of all professionals, including non-health professionals, can reveal priority areas for improvement through integration between different actors and services. Consequently, hospital managers should consider that pieces of knowledge supplied by different professionals would be an added value not only for care improvement, but also for the redesign of the service delivery. In particular, this approach could help them to plan interventions at department and hospital levels and to design patient-centred operational processes.

Since the barriers to effective patient flow occur mainly at the point of delivery, middle management professionals stand at a focal point of observation of the patient's journey. Previous studies have shown middle managers' role in mediating between strategy and day-to-day activities. However, their role in quality improvement project implementation has not yet been described (Zjadewicz *et al.,* 2016; Olsson *et al.,* 2017). In this study, quality gaps and connected improvement proposals by those identified as middle managers, are focused on attaining improvements so that the final service results in better value for the patient. In particular, this study shows how those with a nursing background (i.e. head nurses and nurse bed managers) are able to match both patients' and providers' needs in order not to delay patient care and treatment. Their vision of the level of services integration and their simultaneous high awareness of the patient's needs highlights their role in improving both the quality and the efficiency of hospital care (Needleman & Hassmiller 2009). Considering the involvement of the nursing role at different levels of the organization, further studies should investigate how having a nursing background can contribute to redesigning processes in accordance with a patient-centred perspective.

Hospital patient flow is a sensitive instrument for evaluating a hospital's performance. In this study top managers know the main steps involved, and the consequences of poor management of this process. Top management professionals are able to detect gaps and suggest solutions that benefit both the patient and the organization. However, the global vision of a processes that contain multiple steps and involves different actors can make people lose sight of how, in practice, to integrate different professionals into the daily process.

This study focused on the professional viewpoint and the connections between services, and some areas of the patient journey may therefore remain in shadow. In fact, when considering the patient flow process, the patient is the only actor who goes through all the steps and, therefore, is able to capture what happens between one service and another. Further studies should evaluate whether patient involvement may overcome the high level of fragmentation that characterizes the healthcare system.

This study was designed to inform ongoing local quality improvement in the hospital setting. This could limit the generalizability of findings. However, few qualitative studies explore professionals' perspectives on patient needs in hospital flow management. Additional research should look more deeply at how different

professionals could proactively help in quality improvement by focusing on how achieve better value for patients in different settings and situations.

Conclusions

Providing high quality, efficient health care cannot be accomplished without taking into account the perspective of healthcare professionals on the process of service delivery. The results of this study show that when dealing with a cross-hospital process, redesign efforts focused on a single professional group might not detect important areas for improvement.

The study provides useful insights for healthcare practitioners caring for patients in hospital and for those responsible for planning and designing the hospital patient journey. In value based health care, involving professionals and using their time for improvement processes can be cost effective, and, still more importantly, can raise the value of the service received by patients. Convergent solutions can emerge from different perspectives which can help to integrate the different services at the various levels of the organization around patients' needs.

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Table I. Illustration of structural analysis

Units of meaning What was said	**Units of significance** What the text was talking about	**Themes** Emergence of key themes	**Service quality dimensions**
Head Nurse: "The difficulty is that in the morning the elderly, if they arrive early at seven, in short, this ... wait outside the ward, to prepare the bed, which physically is never free, so leaving them out of the ward is a bit unpleasant" (HD3; Record 266)	Waiting for an available bed	Waiting with no value for the patient	Administrative Quality - Timeliness

Table II. Service quality dimensions adapted from Dagger et al. (2007) and Gustavsson et al. (2016)

Interpersonal Quality	**Technical Quality**	**Environment Quality**	**Administrative Quality**	**Family Quality**	**Involvement Quality**
Interaction	Outcome	Atmosphere	Timeliness	Closeness	Participation
Relationship	Expertise	Tangibles	Operation	Normality	Responsibility
			Support		Capability

Table III. Main characteristics of professionals included in the study

Frontline Staff			
Code	**Sex**	**Position**	**Time from recruitment, years**
Orthopedist 1	Male	Orthopedist Specialist	20
Orthopedist 2	Male	Orthopedist Specialist	5
Orthopedist 3	Male	Orthopedist Resident	3
Nurse 1	Female	Ward Nurse	4
Nurse 2	Female	Ward Nurse	4
Nurse 3	Female	Ward Nurse	7
Nurse 4	Female	Ward Nurse	16
Nurse 5	Female	Ward Nurse	5
Admissions Officer 1	Female	Admissions Officer	3
Admissions Officer 2	Male	Admissions Officer	3
Admissions Officer 3	Male	Admissions Officer	10
Patient Transporter 1	Male	Patient Transporter	12
Patient Transporter 2	Male	Patient Transporter	12
Middle Managers			
Head Nurse 1	Female	Head Nurse Ward	20
Head Nurse 2	Female	Head Nurse Operating Theater	15
Head Nurse 3	Female	Head Nurse Ward	15
Head Nurse 4	Female	Head Nurse Rehabilitation	17
Nurse Bed Manager 1	Female	Nurse Bed Manager	9
Nurse Bed Manager 2	Female	Nurse Bed Manager	11
Medical Management Team	Female	Member of Medical Management Team	5
Top Managers			
Managing Director	Male	Managing Director	9
Clinical Director	Female	Clinical Director	20

Table IV. Steps of the patient journey identified by the professionals

	Front line Staff				Middle Managers			Top Managers	
Patient Journeys' main steps	Orthopedist	Nurse	Administrative Staff	Patient Transport Service	Head Nurse	Nurse Bed Manager	Member of Medical Management Team	Managing Director	Clinical Director
Outpatient visit									
Booking of the outpatient visit		•							
Arrival at the hospital and administrative processing		•						•	
Outpatient visit	•	•	•		•		•	•	
Examination at outpatient clinic									
Call for pre-admission clinic	•				•		•		
Arrival at the hospital and waiting for procedures			•		•				•
Assistance procedures	•	•	•		•		•	•	•
Exit from the Hospital									•
Hospitalization and surgery									
Waiting for inpatient admission									•
Call for inpatient admission notice and confirmation	•	•	•		•	•		•	•
Call for an informational meeting and evaluation of the therapy		•	•						
Execution procedure for blood request			•						
Informational meeting (when possible)			•						•
Arrival at the hospital and waiting for admission						•			•
Administrative admission			•		•	•	•	•	•
Moving to the ward			•			•			•
Waiting in front the Ward entrance					•				
Entry into the Ward		•							
Arrival at the inpatient room									•
Waiting in the inpatient room						•			•
Assistance procedures	•	•		•	•	•			•
Transfer to the Operating Theatre	•	•		•	•	•			•
Waiting in the Transfer bay		•			•				
Assistance procedures					•				
Entry into the Operating Theatre						•			
Transfer to the induction room				•	•				

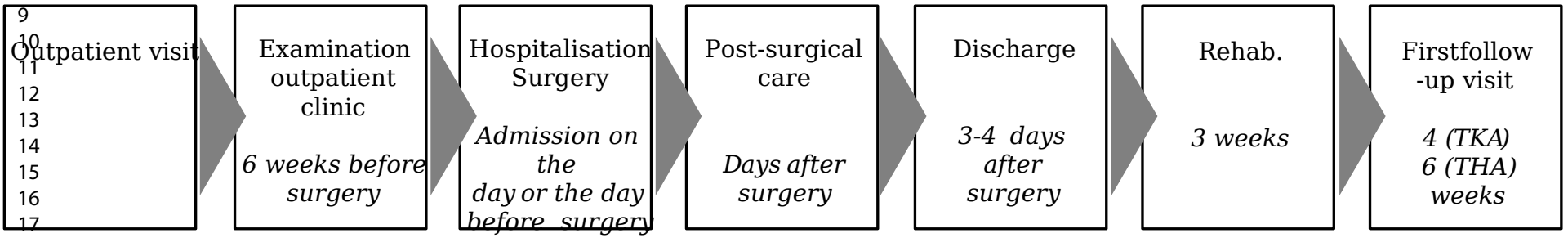
Surgery (unconscious patient)	•	•			•	•	•	•	
Transfer to the post anaesthetic care unit (partially conscious patient)	•	•			•			•	
Post-surgical care									
Transfer and entry to the Ward	•	•				•		•	•
Assistance procedures	•	•				•			•
Transfer and waiting for radiography		•							
Radiography	•	•		•					
Discharge									
Assistance procedures	•	•		•					•
Transfer to the Rehabilitation Units	•	•	•			•	•	•	•
Rehabilitation stay									
Assistance procedures	•	•				•			
Follow-up visit									
Arrival at the hospital and administrative processing	•								
Outpatient visit	•	•					•	•	•

Table V. Summary of main improvement solutions suggested by participants

	Frontline	Middle Management	Top Management
Administrative Quality			
Unit			Explain the reason for the wait in a positive way to the patient (Managing Director)
Department	Post-surgery checking X-ray done in the operating room immediately after surgery (Nurse 1)	Planning the time of hospital admission according to the time of surgery (Nurse Bed Manager 2) Post-surgery checking X-ray done in the operating room immediately after surgery (Head Nurse 1)	
Hospital	Improve outpatient management (Orthopedist 3) Reorganization of waiting list (Orthopedist 2) Improve management of prehospitalization procedures (Admissions Officer 1) Reorganization of outpatient waiting lists for external and internal patients (Patient Transporter 1) Reorganization of outpatient booking reservations (Orthopedist 3) IT communication system for patient transport management (Orthopedist 3)	Have a dedicated gathering space for incoming patients scheduled for surgery (Head Nurse 3) IT communication system for patient transport management (Head Nurse 1)	Centralize the management of the patient's journey (Managing Director)
Technical Quality			
Unit	Improve time spent with patient by physician at the time of discharge: read therapy together (Nurse 5)	Give emotional support to the patient (Head Nurse 2) Inform patient on direct entry to operating theater the day of admission (Head Nurse 2)	
Department	Meeting for patient information and education before admission (during outpatient visit, by a nurse, with written material or audiovisuals, with physiotherapist) (Nurse 1, 2, 3, 4, 5; Orthopedist 2) Decrease telephone calls to patient before admission (Admissions Officer 2)	Patient information and education before admission (Head Nurse 1,3,4) Accompanying the patient from the reception service to the department (Nurse Bed Manager 2) Schedule elderly patients first (Head Nurse 3) Evaluation of the impact on the quality of life at home after discharge (Head Nurse 4) Clear reference telephone contact for the patient's needs after discharge (Head Nurse 3)	Meeting for patient information and education before admission (with anesthesiologist and orthopedist and other patients) (Clinical Director) Understanding if the patient needs a second opinion (Managing Director)
Hospital			Collect data on the welcoming aspect of the hospital and of each professional (Managing Director)
Family Quality			
Unit		Distribution of the ward visiting hours between morning and afternoon (Head Nurse 1)	
Interpersonal Quality			

Unit	Face contact with the surgeon in the operating theater before surgery (Head Nurse 2)

Figure 1 Flow of patients' pathway in total hip arthroplasty (THA)/total knee arthroplasty (TKA) programme and scheduled timing of the study



Consolidated criteria for reporting qualitative studies (COREQ): 32-item checklist

Developed from:
Tong A, Sainsbury P, Craig J. Consolidated criteria for reporting qualitative research (COREQ): a 32-item checklist for interviews and focus groups. *International Journal for Quality in Health Care*. 2007. Volume 19, Number 6: pp. 349 – 357

No. Item	Guide questions/description	Reported on Page #
Domain 1: Research team and reflexivity		
Personal Characteristics		
1. Inter viewer/facilitator	Which author/s conducted the inter view or focus group?	Methods – Data Collection, p. 7
2. Credentials	What were the researcher's credentials? E.g. PhD, MD	Methods – Data Collection, p. 7
3. Occupation	What was their occupation at the time of the study?	Methods – Data Collection, p. 7
4. Gender	Was the researcher male or female?	Methods – Data Collection, p. 7 Title Page
5. Experience and training	What experience or training did the researcher have?	Methods – Data Collection, p. 7; Title Page
Relationship with participants		
6. Relationship established	Was a relationship established prior to study commencement?	Methods – Data Collection, p. 7
7. Participant knowledge of the interviewer	What did the participants know about the researcher? e.g. personal goals, reasons for doing the research	Methods – Data Collection, p. 7
8. Interviewer characteristics	What characteristics were reported about the inter viewer/facilitator? e.g. Bias, assumptions, reasons and interests in the research topic	Methods – Data Collection, p. 7
Domain 2: study design		
Theoretical framework		
9. Methodological orientation and Theory	What methodological orientation was stated to underpin the study? e.g. grounded theory, discourse analysis, ethnography, phenomenology, content analysis	Methods – Design and Setting, p. 6
Participant selection		
10. Sampling	How were participants selected? e.g. purposive, convenience, consecutive, snowball	Methods – Participants, p. 6-7
11. Method of approach	How were participants approached? e.g. face-to-face, telephone, mail, email	Methods – Participants, p. 6-7
12. Sample size	How many participants were in the study?	Results, p. 9

13. Non-participation	How many people refused to participate or dropped out? Reasons?	Methods – Participants, p. 6-7
Setting		
14. Setting of data collection	Where was the data collected? e.g. home, clinic, workplace	Methods – Design and Setting, p. 6
15. Presence of non-participants	Was anyone else present besides the participants and researchers?	Methods – Data collection, p. 7
16. Description of sample	What are the important characteristics of the sample? e.g. demographic data, date	Results, p. 10 Table 3
Data collection		
17. Interview guide	Were questions, prompts, guides provided by the authors? Was it pilot tested?	Methods – Data collection, p. 7
18. Repeat interviews	Were repeat interviews carried out? If yes, how many?	N/A
19. Audio/visual recording	Did the research use audio or visual recording to collect the data?	Methods – Data analysis, p. 8
20. Field notes	Were field notes made during and/or after the inter view or focus group?	Methods – Data collection, p. 7
21. Duration	What was the duration of the interviews or focus group?	Methods – Data collection, p. 7
22. Data saturation	Was data saturation discussed?	Methods – Data collection, p.7
23. Transcripts returned	Were transcripts returned to participants for comment and/or correction?	N/A
Domain 3: analysis and findings		
Data analysis		
24. Number of data coders	How many data coders coded the data?	Methods – Data analysis, p. 8
25. Description of the coding tree	Did authors provide a description of the coding tree?	N/A
26. Derivation of themes	Were themes identified in advance or derived from the data?	Methods – Data analysis, p. 8
27. Software	What software, if applicable, was used to manage the data?	Methods – Data analysis, p. 8
28. Participant checking	Did participants provide feedback on the findings?	N/A
Reporting		
29. Quotations presented	Were participant quotations presented to illustrate the themes/findings? Was each quotation identified? e.g. participant number	Results
30. Data and findings consistent	Was there consistency between the data presented and the findings?	Results
31. Clarity of major themes	Were major themes clearly presented in the findings?	Results
32. Clarity of minor themes	Is there a description of diverse cases or discussion of minor themes?	Results