To Believe or not to believe in what patients say: Theoretical position, measurement and relevance of patient-reported experience for healthcare quality.

By

Seth Ayisi Addo Junior

Thesis submitted in fulfilment of
the requirements for the degree of
PHILOSOPHIAE DOCTOR
(PhD)

PhD Programme in Social Sciences
UiS Business School
2023

University of Stavanger
NO-4036 Stavanger NORWAY
www.uis.no

ISBN: 978-82-8439-213-4
ISSN: 1890-1387
PhD: Thesis UiS No. 741

DEDICATION

This thesis is dedicated to my parents; Mr. Seth Ayisi Addo and Mrs. Thelma Brace. Your fervent prayers for me and your confidence in me spurred me on to complete this milestone. Thank you.

ACKNOWLEDGEMENTS

Although wrought with challenges, my Ph.D. journey would have been unbearable and near impossible, save for the support and love of some people. First, a heartfelt gratitude to my supervisors; Professor Espen Olsen and Emeritus Professor Reidar Johan Mykletun, for their unwavering support, prompt guidance and assistance, as well as dedication to seeing this thesis through, as though it were their own. I am fortunate to have you as my advisors and co-authors. More thanks go to Espen for extending support that transcended academic and professional confines, right from the very first day I arrived in Norway. I truly cherish our chats during our conferences, dinners and bar hopping. I am also grateful to all the faculty and administrative members at the UiS Business School for their immense contribution to my presentations, their company during work trips, and their encouragement.

Secondly, I would like to extend my gratitude to Professor Jane O'Hara at the University of Leeds for her review, insightful comments, and her role as the discussant in my 50 percent and 90 percent seminars. Heartfelt gratitude also goes to Professor Michael Barzelay at the London School of Economics and Political Science (LSE) for his role as my host and supervisor during my time in LSE as Visiting Researcher. I learned a great deal from our lunch discussions and your tutelage. Many thanks to the Department of Management at LSE, especially Camilla Kennedy-Harper, for her timely correspondence and assistance.

I am also extremely grateful to the Norwegian Institute of Public Health (FHI) for granting us access to their survey data. Specifically, I would like to thank Ingeborg Strømseng Sjetne and Øyvind Andresen Bjertnæs at FHI for their support. Furthermore, I would like to extend my gratitude to Jon-Sander Amland and Veronica Bollestad for their assistance and participation in the first screening of my systematic review paper. Additionally, special gratitude goes to my Ph.D. colleagues and office mates at the UiS Business School for their chats, encouragements and contributions to my presentations. Most especially, I am grateful to Kwadwo Atta-Owusu for his advice and support in both professional and personal aspects of my Ph.D. journey.

My last batch of gratitude goes to my family and friends, whose hope and confidence in my abilities, I cannot overlook. I am most grateful to my parents; Mr. Seth Ayisi Addo and Mrs. Thelma Brace, as well as my siblings; Mrs. Jemima Adu-Gyamfi, Mrs Angela Gyamfi, and Nathaniel Asiedu Addo. To my former supervisors and mentors, Professor Kwasi Dartey-Baah and Professor Kwesi Amponsah-Tawiah, both at the University of Ghana Business School, I say thank for your academic grooming and guidance. Special thanks also go to my Ghanaian friends in Norway, especially the master’s students at UiS, and the Association of Ghanaians in Rogaland. I appreciate our time together during hangouts and parties. Heartfelt gratitude also to Ms. Yvonne Awuah for proofreading this thesis, and her support in diverse ways to my Ph.D. journey. Lastly, I would like to thank Almighty God for his favour and blessings in my life.

To all other persons whose names I could not spell out, I say I am most grateful for your contributions to this milestone.

Seth Ayisi Addo Junior,

Stavanger, 2023.

ABSTRACT

The concept of patient experience has gained traction in the past few decades regarding its relationships with patient outcomes and as an indicator of healthcare quality. Patient experience has been deemed a pillar of healthcare quality, alongside safety and clinical effectiveness. Despite this growth in research, some researchers have raised concerns over the subjectivity of the concept as well as the knowledge and skills possessed by patients to accurately assess and report on the hospital environment and healthcare process.

The overall objective of this thesis, therefore, was to ascertain the relevance of patient experience by presenting it as a valid reflection of hospitals' quality care climates through the perspectives of patients. The main research question was: To what extent is patient-reported experience relevant for healthcare quality? To answer this question, the thesis pursued three main objectives: to assess the positioning of patient experience within the healthcare quality literature, to assess the psychometric properties of a patient-reported experience measure, and to assess the longitudinal relationship between patient experience and a clinical outcome in Norway.

The findings of this thesis showed a solid theoretical positioning of patient experience alongside patient outcomes and organisational climate factors in hospitals. It was seen that associations among the three concepts were largely conclusive, and mostly positive. Secondly, it was found during the psychometric assessment that, subject to some improvements, the concept and its measurement possessed reliability and validity for reporting on hospital factors and the healthcare process from the patients’ perspective. Lastly, it was found that patient experience related significantly with hospital-associated infections (a clinical outcome) over time. This ascertained the importance of patient experience for outcomes that were not directly reported by patients.

This thesis contributes significantly to the epistemology of patient experience and its relevance for healthcare quality. The results show the state and direction of the literature on patient experience, the importance of measurement rigor for patient experience, as well as the implications of patient experience for the other pillars of healthcare quality (safety and clinical effectiveness). As the health industry is a complex one with constantly evolving factors (e.g., illnesses, pandemics, demographics), it is imperative to understand that the viewpoint of patients represents a very crucial lens through which healthcare providers can continuously assess the climate of their hospitals and improve their performance.

This thesis presents recommendations relevant for practice and policy, based on the findings. Among other recommendations, hospital management and boards should pursue patient experience improvement strictly and systematically by continuously giving adequate support for both short-term and long-term intervention programmes. Policymakers should also insist on hospitals’ and healthcare providers’ usage of results from national surveys in their improvement programmes. This thesis also gives some directions to future studies for advancing the epistemology of patient experience.

Table of Contents

DEDICATION i

ACKNOWLEDGEMENTS ii

ABSTRACT v

Table of Contents vii

LIST OF TABLES x

LIST OF FIGURES xi

1 Introduction 1

- 1.1 Background 1
- 1.2 Research problems and sub-questions 4
- 1.3 Thesis outline 10
- Table 1 Overview of appended papers and their contributions to the thesis 11

2 Literature review and theoretical underpinning 12

- 2.1 Chapter introduction 12
- 2.2 Definition of key concepts 12
  - 2.2.1 Healthcare quality 12
  - 2.2.2 Understanding patient experience 19
  - 2.2.3 Patient outcomes 26
  - 2.2.4 Organisational climate factors 27
- 2.3 Theoretical underpinning 31
  - 2.3.1 Human experience - consciousness 31
  - 2.3.2 Perception 35
  - 2.3.3 The Donabedian framework for assessing healthcare quality 43
- 2.4 Linkages among the theories under study 45

Figure I Conceptual framework 49

3 Methodology 50

3.1 Research design 50

3.2 Sampling and data 51

3.3 Instruments 54

3.3.1 Eligibility criteria and search string 54

3.3.2 The Patient Experience Questionnaire (PEQ) 56

3.3.3 Patient outcomes 57

3.4 Data Analyses 58

3.4.1 Screening, quality assessment and qualitative synthesis 58

3.4.2 Confirmatory factor analysis (CFA) 59

3.4.3 Psychometric testing 60

3.4.4 Measurement invariance 66

3.4.5 Latent growth curve modelling (LGCM) 69

3.5 Brief overview of the Norwegian health system 71

4 Summary of results from papers 74

4.1 Paper 1: How does patient-reported experience sit within the healthcare quality literature? 74

4.2 Paper 2: What is the extent of validity and reliability of a patient experience measure? 77

4.3 Paper 3: To what extent is patient experience relevant for the other pillars of healthcare quality? 78

5 Discussion and theoretical implications 80

5.1 Scope of patient experience in healthcare quality literature 80

5.2 Patient experience measurement in healthcare quality 84

5.3 Relevance of patient experience for patient outcomes 87

5.4 Theoretical implications and the case for ‘quality care’ climate 89

6 Recommendations, conclusion and directions for future research 94

6.1 Nouvelle contributions 94

6.2 Practical/Managerial implications 95

6.3 Policy recommendations 99

6.4 Conclusion 100

6.5 Limitations of the study 101

6.6 Directions for future studies 103

6.7 Personal reflections 104

7 References 106

PAPER 1 119

PAPER 2 177

PAPER 3 196

LIST OF TABLES

Table 1 Overview of appended papers and their contributions to the thesis 11

LIST OF FIGURES

Figure I Conceptual framework 49

1 Introduction

1.1 Background

The assessment of experiences and outcomes of consumers is key in improving the management of every organisation and improving services from employees. This is no different in the health sector, where the perspectives of patients are strongly considered a necessary basis for improving healthcare quality. Unfortunately, the incorporation of consumer opinions in the health markets have generally lagged, compared to other sectors such as hospitality (Chiou, Lee, Lee, & Lin, 2019).

With the rate of morbidity and multi-morbidity increasing alarmingly in Western countries (Pitter et al., 2019), together with aging populations and healthcare needs of the aged, healthcare professionals are facing heavy pressure to meet these growing needs and expectations of patients (Eng & Pai, 2015). Apropos to these morbidity rates and growing needs of patients, healthcare providers and professionals are expected to ensure positive patient experiences.

The phenomenon of patient-reported experience, also viewed as the humanity of healthcare (Ferrando et al., 2019), has received considerable attention over the years and in recent times. Indeed, patient-reported experience is considered by the World Health Organisation (WHO) as a major indicator of healthcare quality (Murray & Frenk, 2000). The concept is defined by the Beryl Institute as “the sum of all interactions, shaped by the organisation’s culture that influence patient perceptions across the continuum of care” (Wolf & Jason, 2014).

Patient experience is one of the three pillars of healthcare quality, alongside clinical effectiveness and safety (Baker, 2001), and serves as a utilitarian measure by which clinical effectiveness and safety in hospitals can be enhanced (Doyle, Lennox, & Bell, 2013). Therefore, health professionals cannot afford to give low quality health care and negative experiences to patients.

It is worth noting, however, that the concept of patient experience does not exist in a vacuum. The provision of health care services is the totality of interactions between healthcare professionals and patients occurring within an organisational and social context as well as an infrastructural system (Jones & Jenkins, 2007). Invariably, the quest to improve healthcare quality through the assessment and improvement of patient experience cannot be devoid of the factors of the environment (hospital) within which healthcare is given.

These factors are indicative of the climate of the hospital. The conventional idea of organisational climate has been based on the perception of individuals (employees) in the organisation. This then begs the question that if patient-reported experiences are perceptions of the caregiving process within the hospital environment, can these perceptions of patients, rather than employees, be reflections of the climate regarding healthcare quality?

Furthermore, patient-reported experience as a pillar of healthcare quality means the concept should have some relevance for the outcomes of patients. The concept has been found to relate with different forms of patient outcomes (e.g., Bjertnaes, Sjetne, & Iversen, 2012; Bleich, Özaltin, & Murray, 2009; Chen et al., 2022; Kennedy, Tevis, & Kent, 2014).

Patient outcomes can either be subjective or objective. Subjective outcomes are based on perceptions and ratings of patients, for instance, patient satisfaction, patient safety perceptions, and service quality perceptions. Objective outcomes, on the other hand, are mainly devoid of the perceptions of patients, for instance, hospital-associated infections (HAIs), injuries, falls, mortality, and other adverse events. Comparatively, more studies have focused on the relationship of patient experience with subjective outcomes than with objective outcomes.

This thesis contributes to the body of knowledge on patient-reported experience by examining the usefulness of the concept for healthcare quality and making a theoretical propositioning for a ‘quality care’ climate. The main research question therefore is:

To what extent is patient-reported experience relevant for quality care?

To answer this question, the thesis presents three (3) related papers, each with a sub-question. The first paper is a systematic review of patient experiences, patient outcomes, and organisational climate factors; the second paper is a validation of a patient-reported experience measure (PREM) in Norway; and the last paper is a longitudinal study assessing the relationships between and within the trends of patient-reported experience scores and hospital-associated infections (HAIs) scores across hospitals in Norway. These papers are elaborated throughout this thesis. It is worth noting that in this thesis, patient-reported experience and patient experience are used interchangeably.

1.2 Research problems and sub-questions

It would be disingenuous not to acknowledge the inextricable link between patient experience and the context within which patients receive care when assessing the relevance of patient experience for healthcare quality. As Jones and Jenkins (2007) rightly indicated that the process of caregiving occurs within organisational, social, and infrastructural contexts. Thus, an argument can be made that assessing the experience of patients within these contexts is an assessment of the climates of these contexts but from the patients' perspective. This perspective can be deemed complementary to the perspectives of the employees and practitioners regarding the existing climate of the hospitals.

However, Nembhard, Northrup, Shaller, and Cleary (2012) maintained that inadequate quality-oriented organisational climates have, in part, resulted in inadequate patient-centred care and quality in general. What, then, should a quality-oriented climate be? Should it be from the employees' perspective, as with all conventional studies on organisational climate, or should it be from, and include the patients' perspective? This thesis continues its argument that if patient-centredness is indeed a means to improve safety and clinical effectiveness, then a good conceptualisation of quality-oriented climate should mainly be from the patients' perspective. It is imperative, thus, to understand patients' assessments of the existing contexts within which they receive care.

In the systematic review by MacDavitt, Chou, and Stone (2007) on organisational climate and health care outcomes, the associations between organisational climate factors and patient outcomes were found to be inconsistent. They concluded that evidence of associations between organisational climate and patient outcomes is not as robust as the one between organisational climate and nurse outcomes, indicating a need for more research. Considering the increasing attention on patient experience from researchers since this review, there is the need for a systematic review to draw adequate conclusions on whether there have been some changes in the associations between organisational climate and patient-related variables.

This informs the focus of Paper 1 in this thesis which presents a systematic review of the relationships among patient experiences, patient outcomes (both subjective and objective), and organisational climate factors assessed from both employees' and patients' perspectives. The aim of this paper was to ascertain the main directions, dominant methods, and theories on the associations among the three concepts, and to make further theoretical propositions for patient-reported experience. The first research question of this thesis, therefore, is:

RQ1: How does patient-reported experience sit within the healthcare quality literature?

Although the satisfaction of patients with healthcare has been deemed important for assessing quality (Kutney-Lee et al., 2009), the measurement of patient satisfaction has been criticised over the years due to inadequate reliability and validity of measuring instruments, and seemingly false positive ratings from patients (Crow et al., 2002; Iversen, Holmboe, & Bjertnæs, 2012; Sitzia, 1999).

Most researchers (e.g., Cleary, Edgman-Levitan, McMullen, & Delbanco, 1992; Coulter & Cleary, 2001; Garratt, Bjærtnes, Krogstad, & Gulbrandsen, 2005; Wagland et al., 2016) therefore recommend the assessment of patient experiences with healthcare and the caregiving process as a more valid approach and accurate interpretation of healthcare quality.

As such, Loiselle, Howell, Nicoll, and Fitch (2019) maintained that accurate documentation of patient experiences is imperative while Manary, Boulding, Staelin, and Glickman (2013) recommended the development of robust measurements of patient experiences to elicit such accurate information. Wagland et al. (2016) noted that significant progress has been made in understanding patient experience dimensions, often measured with patient-reported experience measures (PREMs).

In Norway, some PREMs have been developed to capture the phenomenon of patient-reported experiences with general health practice, as well as experiences with specific health issues and fields (e.g., Garratt et al., 2005; Garratt, Bjertnæs, & Barlinn, 2007; Iversen et al., 2012; Oltedal et al., 2007). However, an issue that has received little attention is the performance of these PREMs over time, with regard to their psychometric properties, especially those employed to collect data in successive years. Haugum, Danielsen, Iversen, and Bjertnaes (2014) recommended the need to repeat patient experience surveys and their outcomes, as they are potentially affected by contextual factors that change over time.

By inference, it can be said that the underlying structures and rigors of a PREM can be shaken as they are employed over a long period. This is more needful, also, if one considers that reanalysis of other scales such as the Nurse Competence Scale (Wangensteen, Johansson, & Nordström, 2015) did not confirm the factor structure of the initial scale. It is strongly believed that research on patient experience surveys should be intensified, subject to well performing patient experience instruments (Manary et al., 2013). This thesis argues that if patient-reported experience is relevant for healthcare quality, then measures employed to assess it should be valid and reliable such that information gathered with these measures can inform appropriate policies.

This informs the focus of Paper 2 which presents a validation of a PREM; the Patient Experience Questionnaire (PEQ) (Pettersen, Veenstra, Guldvog, & Kolstad, 2004), to ascertain its validity and reliability, as it is one of the measures employed by the NIPH in its national patient experience programme. The second research question of this thesis therefore is:

RQ2: What is the extent of validity and reliability of the Patient Experience Questionnaire?

Additionally, researchers generally agree that patient experience surveys are geared towards improving the quality of healthcare delivery and experience of patients (e.g., Ahern, Dean, Dear, Willcock, & Hush, 2019; Bjertnaes, Deilkås, Skudal, Iversen, & Bjerkan, 2014; Bjertnaes, Iversen, Skyrud, & Danielsen, 2019; Chiou et al., 2019; Iversen, Bjertnæs, Groven, & Bukholm, 2010). While a few studies have been conducted on the usefulness of national patient experiences in quality improvement in hospitals; for instance, in paediatric services (Iversen et al., 2010), there is some significant paucity in research with regard to the extent that patient experiences relate with changes in other hospital quality indicators. Considering the findings of Iversen et al. (2010) that managers and leaders had adequate knowledge of national patient experience survey results, with some implementing the recommendations from these surveys, studies in this proposed direction are needful.

The ability of patients to have adequate knowledge of, and accurately assess healthcare quality based on their reported experiences has been called into question (Manary et al., 2013). However, this thesis argues that one way for ascertaining the relevance of patient-reported experience for healthcare quality is if it has some relations and implications for other quality indicators whose measurements are mainly devoid of patients’ perceptions. By so doing, the assertion that patient experience presents a means for improving the other pillars of quality (clinical effectiveness and safety) would be ascertained. Previous research (Kennedy et al., 2014; Sacks et al., 2015) indicate that patient satisfaction relates well with favourable objective outcomes such as lower cases of mortality, and lower cases of minor complications.

These studies, clearly, focused on the outcome of patient satisfaction but not on patient-reported experience. Seeing that the latter is considered a more valid approach to assessing accurate healthcare (Manary et al., 2013), it is important that its relationships with objective outcomes/indicators are assessed. This informs the focus of Paper 3 which aimed to assess the relationships between the rate of change or growth of patient-reported experience and HAIs across hospitals over five waves of data in Norway. HAIs as an outcome represented the pillars of clinical effectiveness and safety. The third and last research question, therefore, is:

RQ3: To what extent is patient experience relevant for the other pillars of healthcare quality over time?

1.3 Thesis outline

This thesis comprises a cover essay and the three individual papers. The cover essay is presented from Chapter 2 to Chapter 6. Chapter 2 presents the theoretical background of the thesis where the key theories and concepts are discussed and a conceptual framework for the entire thesis is outlined. Chapter 3 presents the methodology employed for this thesis where issues such as data context and data collection are discussed. Chapter 4 presents a summary of the results in each of the papers. Chapter 5 presents the discussion and theoretical implications of the results. The last chapter, Chapter 6, presents the practical implications, conclusion, limitations of this thesis, as well as directions for future research. The three individual papers are presented fully, after this cover essay. Table 1 outlines the overview of each paper and its focus in relation to the main research question.

Table 1 Overview of appended papers and their contributions to the thesis

Appended papers	Variables addressed	Main focus	Data
Paper 1	Patient experience Patient outcomes Organisational climate factors	Explores the relationships among the three concepts in a systematic review to draw relevant conclusions and present relevant research and theoretical recommendations.	Published articles between 2007 and 2022 from online journal databases. (Qualitative synthesis)
Paper 2	Patient-reported experience measure (PREM)	Validates a PREM to ascertain the relevance of valid and reliable measures in assessing and improving healthcare quality from the patients' perspective.	Secondary data from NIPH, patient experience survey (Quantitative)
Paper 3	Patient experience Hospital-associated infections (HAIs)	Examines the longitudinal relationships between the different pillars of quality using patient experience and HAIs as proxies for these pillars.	Secondary data from the Norwegian health Directorate website on quality indicators (Quantitative)

2 Literature review and theoretical underpinning

2.1 Chapter introduction

This chapter begins with the definition of key concepts in this thesis. It then continues with the theoretical underpinnings of the study drawing from the broad management literature as well as healthcare literature. Finally, the chapter presents a conceptual framework to tie all the theories together.

2.2 Definition of key concepts

2.2.1 Healthcare quality

According to Busse, Panteli, and Quentin (2019), there is no consensus on the definition of healthcare quality, and while earlier definitions focused mainly on views by healthcare professionals and researchers, the more recent definitions incorporate perspectives of patients and other relevant actors. A precise definition of healthcare quality was given by Donabedian (1980) as “care that is expected to maximise an inclusive measure of patient welfare, after one has taken account of the balance of expected gains and losses that attend the processes of care in all its parts”. Busse et al. (2019) commend this definition, indicating that by stressing gains and losses, it recognises the natural limit of healthcare quality. This idea of gains and losses is further captured by the Institute of Medicine

(IOM) as a ‘risk versus benefit trade-off’ dimension employed to define healthcare quality (Lohr, 1990).

The IOM analysed 100 definitions of healthcare quality, identifying 18 dimensions and ultimately employing eight (8) in developing a definition for healthcare quality. The eight dimensions were: (i) a scale of quality, which indicates commitment to excellence and continuous improvement, (ii) the nature of the entity being evaluated, that is, the quality of what exactly is being defined whether healthcare, medical care or patient care, (iii) type of recipient, that is, whether an individual or population for whom healthcare quality is defined, (iv) goal orientation, where healthcare quality is defined in terms of implicit or explicit goals, (v) risk versus benefit trade-offs, indicating that healthcare comes with risk (losses) and benefits (gains) where quality is defined based on a net-benefit, (vi) aspects of outcomes both generic and specific ranging from patient outcomes to clinical outcomes, (vii) roles and responsibility of recipient which implies that the recipient is an active party, and (viii) constraints of technology and existing scientific knowledge, which alludes to how far healthcare quality and its improvement can be defined (Lohr, 1990). Based on these, the IOM defined healthcare quality as “the degree to which health services for individuals and populations increase the likelihood of desired health outcomes and are consistent with current professional knowledge” (Lohr, 1990, p. 128).

Comparing the definition of Donabedian to that of IOM also shows two main differences. First, whereas the former focuses on patient welfare, the latter focuses on health outcomes. Busse et al. (2019) note that patient welfare seemed broader than health outcomes but contend that the IOM definition encompassed patient wellbeing and satisfaction. Secondly, there seemed to be a difference in what exactly was being defined. While the definition by IOM focused on healthcare quality by stressing health services in general and on the population, that of Donabedian (1980) focused on patient or medical care and on the patient (Busse et al., 2019).

In recent times, definitions of healthcare quality have taken an attributional approach by specifying attributes that pertain to quality. For instance, the definition by WHO (2018, p. 13) specifies that "quality healthcare can be defined in many ways but there is growing acknowledgement that quality health services across the world should be: *effective*- providing evidence-based healthcare services to those who need them; *safe*- avoiding harm to people for whom the care is intended; and *people-centred*- providing care that responds to individual preferences, needs and values."

WHO further stressed four other attributes, namely, timeliness, equitable, integrated, and efficient as important for health services to optimise healthcare quality. These attributes, especially, the three main ones (effectiveness, safety, patient-centred) also feature prominently in the previous definitions of healthcare quality by WHO in 2006 and the Organisation for Economic Co-operation and Development (OECD) in 2010 (WHO, 2018).

Although quite informative, Busse et al. (2019) maintains that the past 40 years have seen significant debates over these attributes of healthcare quality. Nonetheless, this thesis adopts the definition by WHO for healthcare quality, focusing on the three core attributes: effectiveness, safety, and people-centred. It can be argued that healthcare that is people-centred would be equitable, that is, providing tailor-made care to individuals without any discrimination, as well as integrated, where healthcare is well coordinated. Furthermore, healthcare that is safe would arguably be timely, where harmful delays are reduced, and efficient in reducing waste. Similarly, an effective healthcare should be able to maximize benefits as it is evidence-based, thus being efficient.

2.2.1.1 Improving healthcare quality

Any attempt to improve healthcare quality should take into serious consideration the broad health system because it is within this broader and complex context that quality of care plays out (WHO, 2018). Similarly, Batalden (2018) maintained that healthcare professionals and clinicians are increasingly charged with the mandate of improving the quality of systems within which healthcare is given, owing to the fact that healthcare systems determine whether the care received by patients is of good quality, or otherwise. As a result, there is the need to understand what healthcare system is, to pursue the improvement of healthcare quality better.

Perhaps the most influential framework for describing a health system is that of WHO (2006a). This framework is presented as "building blocks" and where quality is seen as an intermediate goal of the health system alongside safety, access, and coverage, with the ultimate goals being improved health, responsiveness, financial protection, and improved efficiency. The building blocks are service delivery, health workforce, information, medical products, vaccines and technologies, financing, and lastly, leadership and governance.

Noticeably, this framework presents attributes that have been used to define healthcare quality such as safety, effectiveness (medical products, vaccines and technology), people-centred (responsiveness), equity (improved health), and efficiency. More importantly, assessing this framework shows that for a health system to function properly, there must be optimised cooperation and collaboration between patients and healthcare providers and practitioners. For instance, for service delivery to be effective, the needs of patients should be adequately known by providers through information and communication to improve responsiveness. Similarly, for medical products and technology to achieve desired results, patients must comply and should be engaged to improve their health.

These instances resonate with the term coproduction of health by Batalden (2018), distinguishing between product making and service making in a healthcare system. Batalden identifies a shift from the view that healthcare system is about provision of products by clinicians for patients' use, to the view that a healthcare system involves provision of services, where opinions and perspectives of patients as customers are essential for improving healthcare quality and the broad system.

Batalden (2018) identifies key elements that a coproduced health system should entail: health, network, patient participation, professional development, and lastly, assessments and measurements. Health concerns the mitigation of diseases where the aim of the system is improving the health of the patient, which is exclusive to that patient. Network concerns the structure of operation that goes beyond physical facilities to include continuous learning, development, and use of knowledge to meet different needs of patients. Patient participation is underpinned by trust and concerns the role that patients play, and the support they give to the system. Professional development concerns health providers' use of different analytical tools such as informed practices, experiences, skills, and knowledge to maintain and improve the system. Assessments and measurements concerns processes used to determine whether the goals of a coproduced system were achieved, or otherwise, as well as how to address improvement issues (Batalden, 2018).

Evidently, patients are an integral part of the healthcare system. Busse et al. (2019) assessed attributes in 10 popular definitions of healthcare quality and identified patient-centredness, responsiveness, or focus on patients as prominent in 9 of them. As such, any intervention to improve healthcare quality should place patients at the centre. Indeed, for care to be integrated and improved, there must be continued collaboration among the different but related parts of the caregiving process and health system without losing focus on the patient as the centre (Epping-Jordan, Pruitt, Bengoa, & Wagner, 2004; Joober et al., 2018; Singer et al., 2011). To buttress this, Kennedy et al. (2014) acknowledged that healthcare providers that focus more on healthcare professionals often reduce their potential to adequately improve healthcare quality.

If patients are to be the centre for healthcare quality improvement, what then should be their role? Indubitably, patients should be active players in improving healthcare, rather than passive. Thus, the perspectives of patients of the existing health system, as reported by these patients, should be their role in improving the quality. This culminates into the concept of patient-reported experience. As people-centredness is considered a core attribute for defining healthcare quality together with effectiveness and safety (WHO, 2018), so is patient experience considered one of the three pillars of healthcare quality alongside clinical effectiveness and safety (Baker, 2001).

This inclusion of patient experience as a quality pillar by researchers signifies a utilitarian way by which clinical effectiveness and safety can be adequately improved (Doyle et al., 2013). An argument can be made, therefore, that improving patient experience by focusing on the reported perspectives of patients (patient-centredness) invariably improves clinical effectiveness and safety thereby improving healthcare quality. What, then, is patient experience?

2.2.2 Understanding patient experience

Although the concept of patient experience has received increasing attention from researchers and practitioners in healthcare, a formal and universally standardised definition is still lacking (Wolf & Jason, 2014). As a result, different stakeholders have defined and interpreted patient experience in different ways, and this has been one of the causes of difficulty in ensuring positive patient experience by healthcare practitioners, according to experts (Oben, 2020). Wolf and Jason (2014) indicate that a popular definition that has been adopted over the years was given by the Beryl Institute as “the sum of all interactions, shaped by the organisation’s culture that influence patient perceptions across the continuum of care”. Wolf and Jason (2014) point out, however, that the scope of the concept’s definition should cover more ground.

According to Needham (2012), patient experience concerns the management of the emotional and physical journey that a patient encounters while receiving healthcare, and at the same time, enhancing the physical, psychological, and social wellbeing of the patient. Needham proposed a framework for improving patient experience known as the Three Ps. In this framework, he espouses three principles: personalised medicine, partnering with patients, and empowering employees.

Personalised medicine, Needham explains, requires adequate knowledge of the customer (patient) and proper use of customer segmentation. It is about knowing the needs of the patients and characteristics for tailor-made medication. Partnering with patients concerns patient engagement throughout the period and process of receiving healthcare. This is an ongoing process which is needed to gain adequate knowledge of patients and promote personalised medicine. Lastly, empowering employees means encouraging and motivating healthcare practitioners to buy-in and improve patient experience while equipping them with adequate knowledge and resources. Employees should feel empowered to act in the best interest of the patients since they frequently interact with patients (Needham, 2012).

In an attempt to enhance understanding of patient experience, Shale (2013) highlighted three common approaches. The first approach is the ‘naturalistic’ and objective (third person observation), which is an account of a person’s state and experience of illness, for example, being diagnosed with cancer, whereby the immediate concern is to cure the person of said illness and return the patient to the previous state of health. The second approach sees patient experience as customer experience, whereby the healthcare providers’ concern is to find what patients think of them (second-person perspective) and how best to meet patients’ needs. The last approach, Shale terms the ‘first person-perspective’, is about understanding the experience of illness and the experience of care from patients’ perspective because it is their lived experience.

Shale concluded by indicating that patient experience is a ‘moral’ issue such that the inability of healthcare professionals to meet patients’ needs causes some level of moral distress in the professionals. As such, having objective indicators as measurable clinical outcomes is good for medicine as a field, but the field primarily concerns humans, and thus, providers need to consider the patients’ experience of emotional issues such as compassion, care and kindness (Shale, 2013).

Needham (2012) maintained that focusing on only patient satisfaction scores as a way of improving patient experience is myopic and a quest to improve patient experience in totality should move beyond patient satisfaction. Similarly, Shale (2013) indicated that the second approach to understanding patient experience, which is the patient as a customer, has the tendency to confuse patient experience with patient satisfaction since this approach is about what the patients think of hospitals and how hospitals can satisfy their patients’ needs. Researchers of patient experience (Crow et al., 2002; Iversen et al., 2012; Sitzia, 1999) deem this conflation problematic, as patient satisfaction studies have been noted to produce inaccurate and misleading information. Therefore, we know what patient experience is not; that it is not patient satisfaction. What, then, is patient experience in its entirety?

In a bid to cover more ground for the concept, Wolf and Jason (2014) conducted a narrative synthesis based on an extensive literature review and found seven (7) overarching themes that have commonly been used to define patient experience. These themes were: (i) researchers indicate the need for a definition as there have been divergent views on the understanding of patient experience. (ii) the concept is not a one-time experience but involves a process or continuum with many sub-points of interactions. (iii) the definition of the concept should go beyond survey results and measures as only surveys may not adequately capture the scope of patient experience. (iv) some of the definitions place a heavy emphasis on patient expectations where patient experience is measured as expectations of patients being met or not. (v) some definitions place emphasis on alignment with patient-centred care principles, where these principles include personalised high-quality care, timely response, care coordination, reliable and responsive care. (vi) some definitions also focused on the aspect of individualised care where some of the underlying principles were empathy, compassion, responsiveness, continuity of care, information, communication, and knowledge of patients as individuals. (vii) lastly, some definitions placed emphasis on differentiating patient experience from patient satisfaction, indicating that patient experience goes beyond satisfaction to capture issues such as responsiveness. Wolf and Jason (2014) concluded that these themes overlap, and any attempt to define patient experience could use these related themes as foundation for building a standardised understanding of the concept.

According to Oben (2020), patient experience is not only about the events that occur between patients and healthcare providers but also includes their human experiences even before they contact providers. He therefore recommends that practitioners should endeavour to know patients’ total health experience before they experience the healthcare system to completely understand patients’ perspectives.

Oben developed a conceptual framework of three phases and two landmarks to capture the journey of a patient’s experience: the first phase is when the human being is a ‘person’ with basic health and no disease, the second phase is when the human being becomes a ‘patient’ and experiences disease, often triggering fear and anxiety, and the last phase is when the human being becomes a ‘user’, and makes contact with healthcare services and practitioners thereby experiencing the healthcare system (Oben, 2020).

The first landmark is the shift of state of the human being from ‘person’ to ‘patient’ while the second landmark is the shift from ‘patient’ to ‘user’. Patient experience with healthcare services, therefore, encompasses the experience of the human being with the healthcare system, where the physical, psychological, social, and spiritual dimensions of the patient is cared for and managed, and this is the main reason for the existence and operation of the health industry (Oben, 2020).

In the qualitative work by Snyder and Fletcher (2020) to investigate the hospital stay experience from patients’ perspective, four major themes that contributed to informing patient-reported experience were found: (i) the hospital environment which concerns issues such as cleanliness, food quality, and entertainment. (ii) the patients’ factors such as patient expectations, lifestyle, self-care, and family. (iii) hospital personnel, which concerns issues such as size of care team, show of care and compassion, assistance provided, personnel capacity, and personnel collaboration. (iv) feelings of the patient which concerns issues such as anxiety, boredom, irritation, control and autonomy, trust, and confusion.

Snyder and Fletcher (2020) noted that these themes overlap to produce subthemes. Some of these subthemes were identified as patient-provider communications, procedures, patient-provider relationship, processes, and electronic medical record. These themes and subthemes buttress the remark by Oben (2020, p. 906) that patient experience is “multidimensional, multifaceted, and intimately connected concepts with several subsections”. This has contributed to the difficulty in defining the concept.

Evidently, the quest for a standardised definition of patient experience seems to be an arduous task. Nonetheless, an attempt can be made to understand the concept and its underlying tenets based on the varied explanations within the literature. In this thesis, patient experience is operationally defined by the following, non-exhaustive, themes:

- As its foundation, it is a moral issue, and concerns experiences of patients, reported by patients, with the different but related aspects of the healthcare system spanning from a pre-illness state (basic health) through a caregiving phase until after he/she has been returned to the previous state of health.

- It concerns patients’ emotional interpretations of how healthcare providers manage different, related dimensions of their lives, namely, physical, social, psychological and spiritual.

- It comprises individual as well as collective events and occurrences where the patient interacts with different aspects of the healthcare process, with the patient being the focus/centre of the process.

- These aspects include conduct of healthcare professionals in delivering care, the environment within which healthcare is given, communication between patients and professionals, the actual caregiving processes and procedures, among others.

Akin to other social science concepts, a concern with patient experience has been its measurement and distinctness from other concepts, particularly, patient satisfaction. Patient experiences was initially assessed as patient satisfaction (Manary et al., 2013). This became problematic as researchers believed that patient satisfaction lacked a common approach for definition and also focused on issues of happiness which may be determined by factors that do not necessarily relate to patients' experiences of care (Manary et al., 2013). As such, several patient-reported experience measures (PREMs) have been developed to capture the essence and dimensions of the concept in practice.

The measures have ranged from general healthcare practice such as the Patient Experience Questionnaire (PEQ) (Pettersen et al., 2004) and the Out-Patient Experience Questionnaire (OPEQ) (Garratt, Bjærtnes, Krogstad, & Gulbrandsen, 2005) to specialised healthcare practice such as the Psychiatric In-Patient Experiences Questionnaire (PIPEQ) (Garratt, Danielsen, Bjertnaes, & Ruud, 2006) and the Cancer Patient Experiences Questionnaire (CPEQ) (Iversen et al., 2012). The validations of these PREMs have included, among other things, the assessment of relationships with patient outcomes such as patient satisfaction.

2.2.3 Patient outcomes

The increasing attention on patient experience research has also, invariably, increased the attention on patient outcomes, particularly, patient-reported outcomes. It is however important to note that not all patient outcomes are reported directly by patients. Patient-reported outcomes are defined by the Food and Drugs Authority (FDA) in US as reports that come directly from patients on their own health condition before any interpretation of these reports by practitioners, healthcare providers, or any other person (Johnston et al., 2019).

These patient-reported outcomes are often measured using patient-reported outcome measures. Outcomes such as patient satisfaction, perceived health benefits, perceived level of quality, among others, that are reported directly by patients fall under patient-reported outcomes. Patient-reported outcomes provide a holistic interpretation of how beneficial a treatment is. For example, a new drug may show increased survival length for patients but reports from patients on their outcomes may show non-compliance due to adverse side effects (Weldring & Smith, 2013).

Snyder, Jensen, Segal, and Wu (2013) posit that patient-reported outcomes are distinct from other patient outcomes such as caregiver reported outcomes, clinician-reported outcomes, and physiological outcomes. Furthermore, Johnston et al. (2019) indicated that patient-reported outcomes are complementary to biomarkers and other clinical outcomes such as morbidity, hospitalisation, among others. These clinical outcomes and biomarkers are generally devoid of the patients' perceptions and interpretations and can be observed and interpreted by clinicians and healthcare professionals.

It can therefore be argued that patient-reported outcomes are subjective to the patients' interpretations and perception while clinical outcomes of patients are objective, and not subject to their interpretations. In this thesis, patient outcomes refer to both patient-reported outcomes such as patient satisfaction as well as other clinical outcomes that may not be directly reported by the patients themselves, but can be observed on patients, such as hospital-associated infections.

2.2.4 Organisational climate factors

The concept of organisational climate first appeared in literature in the late 1930s, in work of Kurt Lewin, regarding the work environment (Musah et al., 2016). Like most organisational studies concepts, organisational climate remains heavily contested on the basis of its definition. Some scholars define it as the interaction between an individual and the environment (Madhukar & Sharma, 2017). For instance, Litwin and Stringer (1968, p. 1) defined it as “a set of measurable properties of the work environment, perceived directly or indirectly by the people who live and work in the environment, and assumed to influence their motivation and behaviour”. Similarly, Musah et al. (2016) posited that organisational climate represents a link between individual and their working environments, capturing the feelings and perceptions of the employees about the organisation’s working environment.

Madhukar and Sharma (2017) indicate that other scholars define organisational climate as the consequent of the current behaviours and practices in an organisation. For instance, Reichers and Schneider (1990, p. 22) defined it as the “shared perceptions of organisational policies, practices, and procedures, both formal and informal.” Regardless of the focus of the definition, the main idea is that it is from the perspectives of the employees.

Another contention with organisational climate has to do with its relationship with organisational culture. The two concepts have been linked because of their ability to explain organisational performance (Reichers & Schneider, 1990). Some of the elements responsible for changes in organisation climate are also responsible for changes in organisational culture (Olsen, 2009). Both climate and culture are learned, they represent individuals’ interaction and interpretation of their work environment, they are both unidimensional and multidimensional, and concern behaviours of individuals as consequents of their environments (Reichers & Schneider, 1990).

Nonetheless, organisational climate is deemed a relatively enduring characteristic, evolving more rapidly and at a shallower level while culture is deemed a highly enduring characteristic, evolving slowly and at a deeper level of the social context (Olsen, 2009). Despite the similarities between these concepts, this thesis chose to focus on organisational climate due to its ability to evolve faster and more fitting for the health context and hospital environment. The hospital environment is complicated with constantly changing factors that have real life implications for humans, and as such, any attempt to study factors in the hospitals should take this rapidly dynamic nature into consideration.

Furthermore, there has also been contention about whether the concept should be unidimensional or multidimensional. According to Schneider (1975), due to the broad nature of organisational climate, the different units of analysis in organisations (e.g., individuals and teams) as well as the purpose of each inquiry, researchers have focused on specific dimensions under climate such as safety climate (Zohar, 1980) and service climate (Schneider & Bowen, 1985). Indeed, organisational climate had been measured in various ways, and perceptions of employees may not capture all aspects of the work environment adequately (MacDavitt et al., 2007).

How, then, can aspects of the organisation be adequately perceived, assessed and developed? One of the ways in which organisational climate is formed is by the interactionist perspective, where individuals interact with shared characteristics of the organisation such as the size, practices, procedures, and develop similar likings (Ashforth, 1985). In the hospital setting, it is safe to say that patients provide a different but complementary perspective to which organisational climate may be assessed since they also experience some aspects of the hospital environment.

Patients interact with, and experience, aspects such as the flow of their medical information from one department to another, organisation of the caregiving process, how practitioners communicate with them concerning their illnesses and treatment, the food services, infrastructure such as bed, technology, discharge processes, among several others. A good assessment of organisational climate factors within hospitals should therefore endeavour to incorporate perspectives of both healthcare practitioners as well as the patients.

In this thesis, organisational climate factors are operationally defined to encompass perceptions and experiences of both employees and patients in hospitals of the measurable aspects of the work environment. These measurable aspects can be either foundational climate factors such as the hospital size, structure, and management as well as specific climate factors such as service climate and safety climate.

2.3 Theoretical underpinning

Although the attention on patient experience has been increasing over the past few years, the theoretical development of its linkages with other concepts such as outcomes has lagged. Within the literature, the Donabedian framework for assessing healthcare quality (Donabedian, 1980), is considered the most popular framework for assessing interrelationships between patients' interactions with hospital factors and their outcomes (Lawson & Yazdany, 2012). This section discusses the theories underpinning this thesis by borrowing from the general philosophical and psychological literature on human experiences and human perceptions, and then explains their relationship within the Donabedian framework. This is presented as a framework guiding the entire thesis.

2.3.1 Human experience - consciousness

According to Pope (2013), the general literature in psychology, disappointingly, has little reflections of the daily human experience, although it is the most familiar as well as the most mysterious portion of human life. Experience is undoubtedly an inevitable aspect of human life. Halliday (2005) maintained that the two main worlds of human life, matter and meaning, overlap and complement each other in all aspects of human experience, where matter makes meaning accessible to humans, and meaning makes matter easy to organise. The flow of human experience, which is also termed as the stream of consciousness, embodies thoughts, sensations, feelings, perceptions, wishes, among others (Pope & Singer, 1978). Thus, the process of human consciousness can be explained as the process of meaning (Halliday, 2005). What, then, is human experience or consciousness?

The term consciousness or human experience is contested and explained differently by different scholars. Indeed, contemporary psychologists generally agree to disagree on the meaning of the term (Strange, 1978). However, explaining consciousness goes in tandem with identifying the historical development of the concept in literature. Early definitions of the concept have their roots in rational and empirical philosophy in the 18th century among philosophers such as Rene Descartes and John Locke. Experience was then explained mainly as subjective (Pollio, Henley, & Thompson, 1997) and existing in the senses (Strange, 1978).

Human experience was therefore seen as being situated in a somewhat unreachable interior of the thinking subject (Pollio et al., 1997). One of such definitions of consciousness was given by Samuel Johnson in the book "Elementa Philosophica" in 1752 as "…our perception of objects ab extra, or from reflecting or turning the eye of our mind inward and observing what passeth within itself; whereby we know that we perceive all those sensible objects and their connections…" (cited in Strange, 1978, p. 2).

This early period also saw the beginning of the Cartesian dualism, where the mind and body are viewed as being separate from each other, with the possibility of each existing individually. This dualism is heavily underpinned by the famous “Meditations” by Descartes in 1641 in which he concludes: “cogito ergo sum”, which means, “I think, therefore I am”. Descartes indicated that the only absolute truth he can be certain of is that he exists as a thinking entity, separate from his physical body. In this work, Descartes embarked on a method of doubt and sparked the discussions concerning indubitable knowledge of human experience (Hundert, 1990). Strange (1978) indicates that this Cartesian dualism, together with British and Scottish schools of empiricism, dominated American philosophical psychology for about 150 years, where the view of consciousness was introspective and about the self.

From the mid-nineteenth century into the mid-twentieth century, different approaches to understanding human experience had developed. A prominent approach was phenomenology, where the focus of consciousness was not introspective but on the relationship that exists between a living subject and his/her world (Pollio et al., 1997). Phenomenology had little impact in psychology at the beginning as it was more focused on foundational philosophical issues, and it was not until it merged with existential philosophical issues that it began to have significant impact in psychology (Pollio et al., 1997). This merger formed the existential phenomenology approach to understanding consciousness and human experience.

The existential phenomenology approach attempts to move away from the Cartesian dualism to view human experience as a relationship between people and their world, and this world could comprise other people, time, nature, one’s own body, philosophical or personal ideas (Pollio et al., 1997). Existential phenomenology seeks “a rigorous description of human life as it is lived and reflected upon in all of its first-person correctness, urgency, and ambiguity (Pollio et al., 1997, p. 5). An essential part of this approach is the view of the human body from the first-person perspective rather than a third-person perspective.

According to Pollio et al. (1997), the shape and form of the human body as a distinct object is well-defined from a third-person perspective or an outsider; however, from a first-person perspective, the definition of the body becomes less precise, more mobile and not only ending at the toes or head but existing as part of the natural world as any entity, idea or memory. This also is captured in the concept of intentionality, an important characteristic of human experience at the centre of existential phenomenology (Pollio et al., 1997).

Intentionality emphasises that “human experience is continuously directed toward a world that it never possesses in its entirety but toward which it is always directed” (Pollio et al., 1997, p. 7). Intentionality, in the existential phenomenology approach, differs from intention, and Pollio et al. (1997) gives an example to elaborate. If a person (A) offends another (B), A might tell B that “I did not intend to offend you” which means there was no precise plan or intention of offending B. However, the intentionality of the matter is that for A, there is the experience of the offence of B, and for B, there is the experience of the world as offensive. This situation describes different experiences of both persons based on their different engagements in that situation.

Thus, every situation has intentionality whether with mental intention or otherwise, and this intentionality “embodies a relationship between the person and some aspect(s) of his or her present world” (Pollio et al., 1997, p. 7).

In relation to patient experience, when hospitals and practitioners provide healthcare to patients, the patients experience this caregiving process as their situation regardless of the intention of hospitals. Also going by the existential phenomenology approach, when patients report their experience with healthcare, they are describing their lived experience in the first-person perspective, in relation to the world around them (in this case, the hospital environment). More importantly, as this approach to human experience stresses different experiences of the same situation for different people, the concept of perception becomes essential in describing first-person perspectives. What then is perception?

2.3.2 Perception

According to Démuth (2013), humans live in a world of perceptions, and thus, a study of the world is merely a study of perceptions, presenting a unique source of how we experience things. Démuth (2013) gives a breakdown of the development of perception studies. The first phase of perception theories and studies (embedded in cognition studies) began in philosophic theories of knowledge in ancient Greece with a focus on how humans perceive. The second phase, in the Middle Ages saw the shift of perception studies to mathematics and physics. The third phase, in the 17th century, saw perception being studied as more of psychological theories. This era saw philosophers such as Descartes, Kant and Locke who studied how sensory perception related with intellectual knowledge. The fourth phase, in the 19th century, saw the separation of psychology from philosophy as an academic discipline in studying psychics, and an interest in experimental studies of receptors and sensory physiology. The fifth phase, in the 1930s, saw the shift in scholars' attention from basic elements of perception which focused on ways of collecting sensory data to actual understanding interpretation of the data. This era was dominated by approaches such as phenomenology. The current and last phase of perception studies sees the concept as interdisciplinary, with different sciences such as psychology, philosophy, biological, among others, developing a common interest in the study of cognition. Thus, studies on perception are becoming more "scientifically–technological utilitarian matter which involves various scientific approaches and methodologies of study" (Démuth, 2013, p. 19).

Along with the development of perception as a concept came the development of its theories. Relevant theories of perception have been propounded as processes of data acquisition, organisation, and interpretation. These theories can be grouped into two, based on the information flow direction; bottom-up theories and top-down theories (Démuth, 2013). The bottom-up process theories maintain that data acquisition and processing begins at the lowest sensory level and gradually develop into more abstract and complex thoughts. These theories are deemed data-driven and place emphasis on the content and quality of sensory data as well as external objects and phenomena outside the individual (Démuth, 2013).

On the contrary, the top-down theories view data acquisition and processing as a downward flow from higher cognitive contents to lower sensory data. The crux of this approach is that the processing of sensory data requires prior experience or knowledge to help in the breaking down of higher cognitive and complex contents (Démuth, 2013).

The two groups of theories are relevant in understanding perceptions of patients in hospitals. Regarding the bottom-up, patients perceive factors in the hospitals at lower sensory levels such as by what they see (facilities) and what they hear (communication and information). They then begin to make meaning of these lower-level data to understand and assess the entire caregiving process. This also relies on the quality and content of the data they get from the hospital environment which exists outside them. It is therefore not surprising that most bottom-up theories relate with realism (Démuth, 2013).

Concerning the top-down approach, patients consistently experience healthcare, and they build some knowledge and expectations over time. This helps them, sometimes, to make meaning of complex phenomena that they encounter in hospitals, and eventually shapes their perceptions. Two specific theories (one for each group) deemed relevant for this thesis, are presented to elaborate perceptions.

2.3.2.1 Gibson's theory of perception

Gibson's theory of direct perception is one of the most prominent bottom-up theories. According to this theory, the setup of human perception and cognition is developed, influenced and shaped by their external environments based on the sensory data they receive (Gibson, 1950). Human receptors of sensory data are therefore formed to be sensitive to information from the environment, where this information is received in packets (Démuth, 2013). These packets of sensory data could be beams of light for sight that determine the size and shape of an object, vibrating waves that determine the sound of objects, among others; and together they form information that flow directly to the observer (humans) (Gibson, 1950).

This observation point of view may present humans as being passive, but Gibson elaborates the active nature of humans in forming perceptions (Démuth, 2013). In Gibson's view, human motion is the most important aspect of perception. Démuth (2013) gives an example to explain this: a person would get certain specific information about a book (for example, shape, size, colour) when he/she looks at the book from across a table. However, when he/she changes his/her seat around the same table, different set of information can be seen of that same book as well as other objects on the table that, hitherto, he/she was not privy to. This human movement changes the human receptors of sensory data, and it is essential for environmental mapping and awareness.

It is worth noting that, in Gibson's view, the information that we perceive about things does not change, and it is independent of humans. That is, when humans change positions, they only alter the set of information about an object that is available to them at that point in time but the reality and make-up of the object being perceived does not change (Démuth, 2013).

Furthermore, Gibson (1979) indicated that human perception does not only border on the basic information about objects such as size and shape, but this basic information helps humans to determine the important functionalities and applications of objects. For instance, seeing a ladder or a hammer would inform the perceiver about their uses for climbing and for driving nails respectively (Démuth, 2013).

This view of Gibson is in line with the phenomenological approach to experience in the sense that humans do not necessarily need prior experience or knowledge about the object to know its uses; they rather need to pay attention to the object (Démuth, 2013). This movement from basic information to perceived uses and applications resonates with the bottom-up approach.

In relation to this thesis, patient perceptions are shaped by the hospital environment where they receive information about hospital facilities and procedures. Going through the caregiving process allows them to receive information about different aspects and objects in the hospital environment. They also, more likely than not, may not have prior experience or knowledge about these aspects of the hospital environment but by observing keenly, they can understand the functionalities of the hospital. However, since healthcare is an ongoing process and patients would usually visit the hospitals more than once in their lifetime, what impact do these intermittent encounters with the hospitals have on their perceptions over time?

Gibson’s theory is seen to be impactful in understanding perception. It presents humans as being inextricably part of the environment, gives a strong indication that the environment where sensory data is collected contains more information than humans usually perceive, and also stresses the automated nature of visual perceptions (Démuth, 2013).

Nonetheless, this theory has been criticised on the basis that it places little importance on higher level cognition, previous experiences of an environment, and learning, in forming perceptions of humans (Démuth, 2013). This shortcoming is countered by theories under the top-down group. This thesis therefore adds Gregory’s theory of perception, a theory under this group, to better explain the general theoretical underpinning.

2.3.2.2 Gregory’s theory

The top-down group of perception theories can be further categorised into three: constructivist, computational and synthesizing theories (Démuth, 2013). The theory by Gregory (1990) falls under the constructivist category. This category of theories assume that perception is the result of a very active and iterative process of sensory data extraction, evaluation, and interpretation; thus, a continuous interaction between external data from environment and internal processes in individuals including their knowledge and expectations (Démuth, 2013).

While Gregory acknowledges the importance of sensory data receptors in human perceptions (similar to Gibson), he contrarily places little importance in their role in forming perceptions. The importance of these receptors is however determined by the previous experience of humans (Gregory, 1968, 1990). Gregory doubts that human sensors possess the ability to make meaning of data, but they require a higher level of cognition and learning for this (Démuth, 2013). When human senses receive data, it is usually unprocessed and disorganised, and as such, humans construct hypotheses to interpret, simplify and make meaning of this large data (Gregory, 1990).

Démuth (2013) explains that the process of verifying hypotheses is what constructivism is about. It means humans do not just accept raw sensory data as absolute, but they attempt to organise them according to hypotheses, and eventually, they tend to accept data that support the hypotheses and ignore that which do not (Démuth, 2013).

Gregory (1990) therefore believes that in order to properly form hypotheses and assess them against sensory data, humans need ideas and information based on their previous experiences. Thus, for interpretation, experience is vital and more important than sensory data. These experiences also embody human expectations and motivations. According to Gregory, therefore, "to see means to believe, that the given object is what it is, but also, that our perception is determined by attitudes, emotions and expectations" (Démuth, 2013, p. 35).

In relation to this thesis, patient perceptions of healthcare are shaped by their emotions, attitudes and expectations, which culminate into their experiences. As healthcare is a continuous process where patients experience it from time to time, it suffices to say that their previous experiences guided by their expectations would shape their perceptions such that when they encounter and interact with hospital factors, they will be able to interpret and make meaning out of them. This interpretation would shape their perception of the caregiving process as acceptable or otherwise.

Gregory's theory helps to clarify reasons for illusions and complex perceptions, and perhaps, the greatest benefit of this theory is that is considers an individual's history and emotions in forming perceptions (Démuth, 2013). It has however been criticised on the basis of its inability to explain why perceptions tend to be universal although individual experiences and emotions differ; and secondly, that Gregory fails to specify where hypotheses come from in the first place since they are not present in early childhood (Démuth, 2013).

The theories presented give good insights into how humans form their perceptions. However, perceptions are formed about particular objects, where these objects could be tangible or intangible. There is the need, therefore, to clarify the setting or environment which humans form perceptions about. By extension to healthcare, a bugging question would be: what do patients form perceptions about? A framework for assessing hospital environment and its quality is thus presented next.

2.3.3 The Donabedian framework for assessing healthcare quality

This framework by Donabedian (1980) is perhaps the most famous theoretical framework for assessing healthcare quality in the past few decades (Lawson & Yazdany, 2012). Donabedian sought to propose how healthcare quality should be measured, beginning with a definition of quality. He elaborated this definition by highlighting three key elements for understanding healthcare quality, depending on how broad or narrow it should be: the performance of the healthcare practitioners and providers (technical and interpersonal knowledge), the care received by patients (participation and contribution of patients and providers), and the care received by the community (healthcare access, performance of providers and patients).

Donabedian further indicates that to properly assess healthcare quality, certain issues need to be addressed. For instance, who, what activities, and how these activities are to be assessed as well as the expected outcomes of these activities. Based on this, he proposed a framework for assessing healthcare with three categories: structure, process and outcome.

The first category for assessment, which is the structure, deals with the setting within which healthcare is given. This covers "material resources (such as facilities, equipment, and money), of human resources (such as the number and qualifications of personnel), and of organisational structure (such as medical staff organisation, methods of peer review, and methods of reimbursement)" (Donabedian, 1980, p. 1745). This category answers the questions of who and what activities are being assessed.

The second category, which is the process, deals with the caregiving process. It entails "the patient's activities in seeking care and carrying it out as well as the practitioner's activities in making a diagnosis and recommending or implementing treatment" (Donabedian, 1980, p. 1745). This category answers the questions pertaining to how the activities are supposed to be conducted. Issues such as how doctors and nurses are supposed to attend to patient and communicate with them, among several others, feature under this category.

The last category, which is outcome, deals with the aftermath and effects of the caregiving process on the health of the patients. Donabedian (1980, p. 1745) states that "improvements in the patient's knowledge and salutary changes in the patient's behaviour are included under a broad definition of health status, and so is the degree of the patient's satisfaction with care." It therefore entails outcomes that are directly reported by patients as well as those not directly reported by the patients themselves. This category deals with the question of the purposes for which healthcare activities are carried out.

Although this framework has been widely employed to understand quality and how it is measured, it has not gone without critiques. A major critique is that to fully understand this framework, relationships between and among the categories are required (Bjertnaes et al., 2012). In fact, Donabedian (1980) admits that this framework is as effective to the extent that the relationships between the categories are already established, and that the establishment of these relationships comes from the broad literature of organisational science.

This thesis draws on the relationships between the categories based on the principles of patient-centredness and integrated care, where patients are the focus of the caregiving process, and their participation and involvement are upheld. What better way to focus on patients than to actually seek their experiences and perceptions about the hospital environment and caregiving process? Thus, patient-reported experiences with structure and process are linked with both subjective patient-reported outcomes and objective clinical outcomes in this thesis.

2.4 Linkages among the theories under study

The theoretical discussions so far indicate an indubitable nexus between human experiences and human perceptions. The study of perceptions is only a study of how individuals experience the world uniquely (Démuth, 2013). In this sense, human perceptions are shaped by human experiences with the external world where their receptors gather sensory data (Gibson, 1950). Human perceptions are also formed when prior experience aid in interpreting this sensory data at a higher cognition level (Gregory, 1990). In turn, these perceptions enrich human experiences and build knowledge. This building of knowledge pertains to the philosophical realm of epistemology.

Epistemology is the study of the nature and limits of knowledge and overlaps with psychology in the area of how humans gain this knowledge (Hundert, 1990). According to Démuth (2013), while some epistemologists believe that knowledge is as a result of internal search and discovery within a person, many other epistemologists believe that human experience with their external environments is the basic source of knowledge. While both sources of knowledge have their shortcomings, combining them paints a vivid picture of the discussion thus far in this thesis: knowledge about things in the world is shaped by internal dialogues within humans about innate ideas as well as external interactions with tangible and intangible objects in the world which form human experience and embody perceptions, emotions and expectations.

The application of this to healthcare delivery and the caregiving process should then be simple. In order to improve healthcare quality, we must build our knowledge and understanding of it. To achieve this, we must know the human (patient) experience of healthcare. By examining this patient experience, we invariably assess aspects of healthcare that these patients interact with. Thus, patient interaction with the hospital environment equips them with sensory information about healthcare and its level of quality. This data would pertain to the structure of caregiving such as the facilities available, as well as the process through which they receive care, espoused by Donabedian (1980). This information shapes their perceptions.

Furthermore, patient perceptions are developed and reshaped as they interpret their interactions with the hospital environments based on their previous hospital visits. These perceptions then culminate into their experiences which builds knowledge about the healthcare process, its level of quality, related outcomes as well as possible areas of improvement.

Epistemology is often concerned with the validity of human knowledge, and this raises conceptual as well as factual issues (Hundert, 1990). This is especially evident in philosophical and psychological concepts such as perception and experience. Indeed, Eysenck and Keane (2008) maintain that perception is a consequent of several individual factors and this may result in reduced accuracy and adequacy in interpretation and knowledge. Similarly, human experience encompass several distinct scenarios that are subject to agreement among a group of people, where this consensus, or otherwise, leads to building of knowledge about phenomena (Pollio et al., 1997). Therefore, in order to ascertain knowledge, it must be valid and engender confidence that it is true regardless of context. How then do we assess and determine knowledge that is valid? This forms the basis of psychometric theory of measurement.

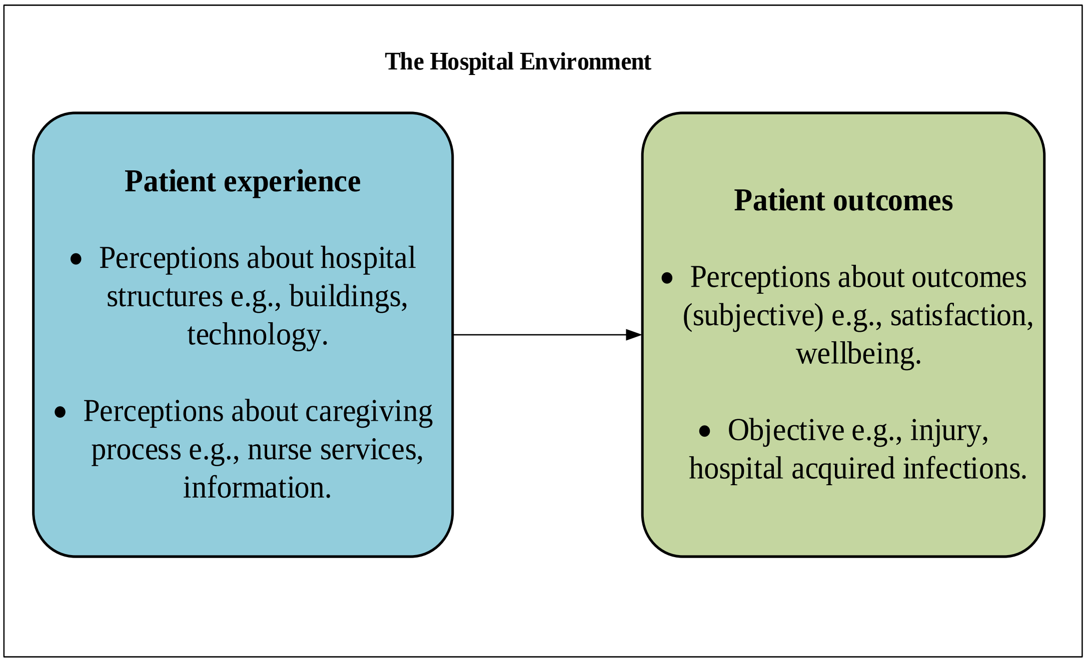
Measurement is deemed an important concern across several contexts in social science research (DeVellis, 2016). Measurement comprises rules based on which symbols are assigned to objects to quantify their attributes and numerically represent those objects (Netemeyer, Bearden, & Sharma, 2003). In social science research, these objects are people, the rules are how the assignment of numbers and symbols is done while the attributes are characteristics of the objects being measured (Netemeyer et al., 2003).

Psychometrics is a subspecialty within the behavioural and social science research concerned with the measurement of psychological and social phenomena (DeVellis, 2016). Psychometric theory indicates the need to understand these phenomena by advancing the understanding of how to measure them, whether concrete or abstract (Olsen, 2009). In other words, establishing and ensuring valid and reliable measures of a particular phenomenon is crucial for the epistemological advancement of that phenomenon. The concept of patient experience, embodying patients' perceptions of the hospital environment, is of no exception in this regard.

This thesis, therefore, seeks to contribute to the epistemology of patient experience towards improving healthcare quality, based on the objectives of three individual papers. First, to describe the current state of knowledge on patient experience and its relationships with organisational climate factors and patient outcomes (Paper 1); secondly, to ascertain the validity and reliability of a patient experience measure (Paper 2); and lastly, to add to the knowledge on the relationship between patient experience and patient outcomes focusing on a clinical outcome rather than the more common patient-reported outcomes (Paper 3).

Figure I presents an illustration of the linkages among the theories underpinning this thesis.

Figure I Conceptual framework



3 Methodology

3.1 Research design

A research design presents a procedure for gathering and analysing data as well as interpreting and reporting the data (Creswell & Clark, 2017). However, research problems in social sciences are constantly increasing in complexity, thus necessitating the need to combine both qualitative and quantitative designs (Yu, 2009). This thesis employs the mixed-method design to adequately tackle the research problem and answer the research questions. It was deemed appropriate that both qualitative and quantitative techniques be used to achieve the overall purpose.

Creswell and Clark (2017) further indicated that once a research problem is deemed complex enough to be addressed by a mixed method, a specific strategy under mixed method should also be chosen. This thesis thus employed the concurrent triangulation strategy identified by Creswell, Plano Clark, Gutman, and Hanson (2003), one of six strategies under mixed-method. The concurrent triangulation strategy was further developed by Creswell and Clark (2017) as convergent design, stressing that while the former focuses on timelines, the latter focuses on the intent of the study design, which is to converge the results of both qualitative and quantitative designs in order to enhance understanding of the study. This strategy was chosen for this thesis to enhance the understanding of the role that patient experience plays in healthcare quality and its promotion.

The thesis employs either qualitative or quantitative design for each paper with the purpose of converging the results from the papers towards promoting the relevance of patient experiences in healthcare. Paper 1 employs a qualitative design. It focuses on a systematic search and review of literature and uses thematic analysis to draw themes across the articles that were finally included. These themes facilitate the descriptive synthesis based on similarities and differences among these articles. Paper 2 employs a quantitative, cross-sectional design to do a psychometric testing, validating an existing patient-reported experience measure (PREM). This paper used confirmatory factor analysis to determine the reliability and validity of the PREM. Paper 3 employs a quantitative, longitudinal design to analyse relationships between growth/change rates of patient experience and hospital-associated infections across hospitals. The subsequent sections under this chapter present how the tools and techniques, whether qualitative or quantitative, were used for each paper.

3.2 Sampling and data

Paper 1 was conducted based on a sample of published articles. These articles were searched in and obtained from online journal databases, specifically, APA PsycNET, PubMed, PsychINFO, Medline, CINAHL, Academic Search Premier, Web of Science and Scopus. Data was then extracted from the articles that were finally included. The main purpose and study variables, context, designs and sampling, analyses, and main outcomes were the data extracted from the articles. Based on these, themes were drawn and under each theme, similarities and differences among the articles were synthesised and discussed, and recommendations were made.

Paper 2 used anonymised survey data from the Norwegian Institute of Public Health (NIPH) on patient-reported experience and some patient-reported outcomes. The survey is annual and aims at using feedback to identify which areas need improvement in the hospitals in Norway. This survey was conducted among adult inpatients at somatic hospitals across Norway, but the data for this paper focused on the South-East Regional Health Authority (RHF). These somatic hospitals were not specialised but dealt with general medical issues. The survey was started by the Norwegian Knowledge Centre for Health Services in the fall of 2015 and was continued by the NIPH in the first quarter of 2016.

The survey engaged patients from 5 main hospitals in the region who were admitted for at least a night between October and November in 2015 thus excluding outpatients. These patients, numbering up to about 8381, were identified through their contact information after they were discharged, and questionnaires were sent to their respective addresses via post mail with a return envelope. The total number of 4603 respondents completed and returned their questionnaires, yielding a response rate of 54.92%. Patients were asked to respond to the questions based on their experiences of various aspects of the hospital while under admission.

Paper 3 used data from the website of the Norwegian Health Directorate (Helsedirektoratet, 2022). This data was on patient experience scores and HAIs scores as national quality indicators for hospitals across Norway over 5 years: 2014, 2015, 2019, 2020, and 2021. On average, data on about 80 hospitals in the 4 health regions of Norway were sampled for each year. However, data cleaning resulted in the use of data for 61 hospitals over the period. This data was gathered by the NIPH among randomly sampled discharged patients of about 400 per each hospital for each year.

Data for patient experience scores were averaged for each hospital under each study year based on the following dimensions: nursing staff, doctors, information, organisation, relatives, standard, discharge, patients' relatives, and interactions. Data for HAIs were recorded as a snapshot of the number of infections and adverse events resulting from hospitalisation as well as the use of antibiotics within the hospitals. It is mandatory for hospitals to record such incidents and this data was taken twice a year for each hospital, May and November. The sum of scores for hospitals in May and November for each year were computed and used in this study.

3.3 Instruments

3.3.1 Eligibility criteria and search string

In Paper 1, the search for literature was conducted based on eligibility criteria and a search string developed by the researchers and with the help of a librarian. The eligibility criteria aided in the search for literature as well as the screening of articles for final inclusion. The criteria are elaborated below.

3.3.1.1 Inclusion criteria

- Studies that focus on adult in-patients in general healthcare published in peer reviewed journals from 2007 forward.
- Studies that focus on associations between at least two of the variables (patient experience, patient outcomes, and organisational climate factors from both patient and employee perspectives).
- Studies were not restricted to any geographical location.
- Studies published only in the English language.
- Studies employing quantitative methods or mixed methods to assess statistical associations (for instance in cross-sectional and longitudinal studies) or significant changes (for instance in studies using longitudinal, intervention, and RCT designs) among the variables.

- Lastly, studies that used primary or secondary responses from patients.

3.3.1.2 Exclusion criteria

- Studies that focused on children and childcare or on patients with one specific illness (e.g., stroke patients).
- Studies focusing solely on patients in other departments in the hospital aside inpatient department (e.g., outpatient department, emergency department, etc.).
- Lastly, studies that employ solely qualitative designs and methods were excluded as the review was interested in the general direction of associations among the variables.

The search string is presented in Paper 1 as Appendix A. The search string was based on the three concepts (patient experience, patient outcomes and organisational climate factors) and their synonyms. The search string also featured operators such as ‘AND’ and ‘OR’ and filtered according to year and language of publication. This was modified according to the database that was being searched in.

3.3.2 The Patient Experience Questionnaire (PEQ)

Data on patient-reported experience for Paper 2 and Paper 3 was based on the use of the PEQ by the NIPH in conducting annual national surveys on patient experience. The PEQ was initially developed by Pettersen et al. (2004). The NIPH adapted, modified and used some dimensions and items under this measure. The dimensions and items are the following: “nurse services” (7 items, e.g., “Did you find that the nursing staff cared for you?”), “doctor services” (7 items, e.g., “Did the doctors have time for you when you needed it?”), “organisation” (4 items, e.g., “Did you find that the hospital’s work was well organized?”), “information” (3 items, e.g., “Did you know what you thought was necessary about how tests and examinations should take place?”), “standard” (6 items, e.g., “Did you get the impression that the hospital equipment was in good condition?”), “next of kin” (2 items, e.g., “Was it easy for your relatives to get information about you while you were in the hospital?”), “discharge” (2 items, e.g., “Were you informed of what you could do at home in case of relapse?”), and “interaction” (2 items, e.g., “Do you find that the hospital has worked well with your GP about what you were admitted to?”). These items were measured on a 5-point Likert scale ranging from ‘Not at all’ (1) to ‘To a very large extent’ (5).

It is worth noting that in Paper 2, the PREM was used by focusing on the items underlying each dimension that contribute to the overall measure, but in Paper 3, scores for the overall patient experience measure for each hospital and for each year was used. This was done for two main reasons. The first reason is that the data for Paper 3 did not capture scores for items for each hospital and year but rather captured scores for the dimensions.

The second reason is that although the study could have used dimension scores, it would have resulted in more complexity. This would have required many growth curve models, one for each dimension. As such, there was the need to be pragmatic. It was deemed fit, therefore, to use averages of these dimension scores for each hospital and for each year in the third paper, thereby setting the foundation for later studies to focus on the dimensions. That notwithstanding, adequate measures were taken to ensure normality and as little bias as possible.

3.3.3 Patient outcomes

The surveys by the NIPH also included measurements of patient outcomes. Paper 2 included some patient-reported outcomes. Specifically, patient satisfaction, health benefits and health level were measured with one item each on a 5-point Likert. Patient satisfaction scores ranged from ‘Not at all’ (1) to ‘To a very large extent’ (5); health benefits scores ranged from ‘No benefit’ (1) to ‘Very huge benefit’ (5); and health level scores ranged from ‘Bad’ (1) to ‘Excellent’ (5). Regarding hospital-associated infections in Paper 3, data was gathered by the NIPH from the Norwegian surveillance system for antibiotic use and healthcare-associated infections (NOIS). This data was made available on the Norwegian Health Directorate website (Helsedirektoratet, 2022). The purpose of NOIS is to monitor healthcare associated infections and antibiotic use to get an overview of frequency, risk factors and way of prevention among patients across hospitals. Among other HAIs, NOIS took records of the four most frequently occurring infections: bloodstream infections (septicaemia), urinary tract infection, post-operative infections, and lower respiratory tract infection.

3.4 Data Analyses

3.4.1 Screening, quality assessment and qualitative synthesis

In Paper 1, the articles that were included after removal of duplicates were screened, assessed for risks, and synthesised qualitatively. These, and earlier stages of the paper, were done based on the guidelines in the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) (Shamseer et al., 2015) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Moher et al., 2015). The main aim of the PRISMA is to aid researchers in reporting systematic reviews and meta-analyses adequately (Moher et al., 2015). The screening phase comprised two stages: first on title and abstracts, and second, on full texts. This was done by two authors independently, aimed at promoting objective selections of articles (Shamseer et al., 2015). The eligibility criteria was used as the basis for inclusion or exclusion to the next stage.

After the screening on full text, a risk of bias assessment was conducted for each article included. This was done using the National

Institutes of Health (NIH) quality assessment tool for observational, cohort and cross-sectional studies (NIH, 2021). Some of the items in this tool dealt with whether or not there were clearly stated research questions, justified population and sample, appropriate methodology and analytical tools, among others. The final list of articles were then analysed qualitatively. Shamseer et al. (2015) indicated that all instances of systematic reviews involve qualitative synthesis, whether or not a meta-analysis (quantitative) has been done. This synthesis was done based on broad themes, under which similarities and differences were identified.

Some steps in thematic analysis identified by Braun and Clarke (2006) were thus employed to elaborate the themes: familiarizing with the data, generating initial codes, defining and naming themes, and producing the report. The screening, risk of bias assessments and data extraction were conducted with the aid of the EPPI-Reviewer software (Thomas et al., 2022) while the qualitative synthesis was conducted manually.

3.4.2 Confirmatory factor analysis (CFA)

Confirmatory factor analysis (CFA) was conducted with the aid of IBM SPSS and IBM AMOS in Paper 2, and with IBM SPSS and Mplus (Muthén & Muthén, 1998-2022b) in Paper 3. CFA is done to assess the factor structure of a latent variable. CFA models, also known as measurement models, are developed to assess the outer model of a structural equation model (SEM), which consists of the relationship between a construct (latent/unobserved variable) and its items/questions (observed variables) (Hair, Sarstedt, Hopkins, & Kuppelwieser, 2014). For instance, a sub-dimension of patient-reported experience such as doctor services is a latent variable while the seven (7) items that measure it are the questions.

Thus, a CFA model allows the researcher to assess how each item relates with and loads unto this latent variable. It is necessary to conduct a CFA in order to correct errors in evaluating the underlying factors of constructs, thereby ensuring valid and reliable information from the items. As the name indicates, a CFA can be used as a tool to confirm existing theories (Schreiber, Nora, Stage, Barlow, & King, 2006).

3.4.3 Psychometric testing

In Paper 2, the main purpose of conducting the CFA was to run tests on the psychometric properties of the PEQ for measurement validation. Different criteria exist for validating a measure; however, most social science researchers generally agree on repeatability (that measurement results should be repeatable in different contexts) and standardization (that the measure is practicable, and the rules are clear and independent of the researcher) (Netemeyer et al., 2003; Nunnally & Bernstein, 1994). The dangers and costs of using a poor measure (one that is not repeatable and standardised) may be dire and greater than any benefits gained (DeVellis, 2016). According to Netemeyer et al. (2003), the measurement properties of reliability and validity lie at the heart of repeatability and standardization. Paper 2 in this thesis thus assessed reliability and validity as well as the dimensionality of the PEQ. These properties are explained further.

3.4.3.1 Dimensionality

The dimensionality of a measure focuses on the homogeneity of its items (Netemeyer et al., 2003). A number of items grouped together is not necessarily a scale, and therefore, ascertaining underlying latent variables of observed items is important (DeVellis, 2016). A measure could be unidimensional or multidimensional. When a measure is considered unidimensional, it means a single construct or latent variable (dimension) underlie all the items. However, a multidimensional measure indicates that more than one latent variable underlie the items, in which case some items would be more highly correlated with each other than others (Netemeyer et al., 2003).

For instance, patient experience would be considered unidimensional if all the items are underlined by a single broad construct. However, patient experience is considered multidimensional since there are subdimensions or sub-latent constructs such as doctor services and nurse services, each with their items. Unidimensionality is seen as a precursor to assessing reliability and validity (Netemeyer et al., 2003), and the best means of determining the dimensionality of a measure is by conducting factor analysis (DeVellis, 2016). Paper 2 conducted a CFA to assess the dimensionality of the PEQ.

3.4.3.2 Reliability

The property of reliability concerns the consistency of a measurement. It is that portion of measurement owing to “permanent effects that persist from sample to sample” (Netemeyer et al., 2003, p. 10). A reliable measure is “one that performs in consistent, predictable ways” (DeVellis, 2016, p. 39). Thus, regardless of situations, populations, samples or contexts, a reliable instrument should generate similar results. Broadly, two types of reliability can be tested: test-retest reliability and internal consistency.

Test-retest reliability focuses on stability, and it assesses the correlation between a person’s scores at different points in time on the same set of items and constructs (Netemeyer et al., 2003). However, internal consistency has been employed more often by researchers to assess reliability. Internal consistency refers to the “homogeneity of the items within a scale” (DeVellis, 2016, p. 42); it concerns the level of correlation and interrelatedness between items on a measure (Netemeyer et al., 2003). A measure is reliable insofar as internal consistency reliability coefficient is high.

Perhaps the most widely used reliability coefficient is the Cronbach’s coefficient alpha (Cronbach, 1951); where a value of .70 or above out of 1.00 is deemed acceptable for confirmatory research (Nunnally & Bernstein, 1994). However, a major concern with Cronbach’s alpha is that it is sensitive to the number of items on a measure, and it increases as the number of items increases (Netemeyer et al., 2003). For this reason, Hair et al. (2014) indicated that composite reliability (CR) is a better reliability coefficient of internal consistency than Cronbach’s alpha. An acceptable coefficient for composite reliability is similarly .70 or above (Hair et al., 2014). Composite reliability was therefore employed to assess the reliability of the PEQ, its dimensions and items, in Paper 2. For instance, CR value was computed for the 7 items under the dimension of doctor services on the PEQ.

3.4.3.3 Validity

Ascertaining reliability of a scale or measure does not necessarily mean that the latent construct shared by the items is what the researcher is interested in; this concerns whether the covariations among items are caused by the latent construct of interest (DeVellis, 2016). In other words, validity is an assessment of whether the scale and items measure the construct or latent variable (e.g., patient experience, nurse services, etc.) that they are intended for. Different types of validity can be combined and used in measurement development and assessments (DeVellis, 1991, 2016; Netemeyer et al., 2003). Paper 2 however employed construct validity, convergent validity, discriminant validity, and predictive validity. Paper 3 also assessed predictive validity. These types of validity are explained further.

3.4.3.4 Construct validity

Construct validity refers broadly to the extent of which legitimate inferences can be drawn between the theoretical constructs or variables and the measures employed in studying those constructs (Netemeyer et al., 2003). Thus, a measure has construct validity insofar as the operationalised measure adequately reflects the concept under investigation within a body of research. This type of validity concerns "the overarching quality of a research study or even a programme of studies, with other categories or types of validity being subsumed under construct validity" (Netemeyer et al., 2003, p. 71). Construct validity therefore represents an umbrella for which other types of validity exist. Together, with the aforementioned types of validity, item loadings were used in assessing construct validity in Paper 2, where item loadings on constructs were deemed good if they were .60 or above, out of 1.00.

3.4.3.5 Convergent validity

Convergent validity concerns the relationship between a construct and its underlying items (Hair et al., 2014). Convergent validity is ascertained when and if the items on a latent construct converge, or are highly correlated (Netemeyer et al., 2003). In Paper 2, the Average Variance Explained (AVE) was used in assessing convergent validity. The AVE represents the variance in the items that is explained by the construct, based on the factor loadings of the items; where an AVE of .50 or more is deemed acceptable (Hair et al., 2014). This would mean that at least 50 percent of the variance in the latent construct is captured and explained by the items. For instance, AVE was computed for nurse services based on its 7 items.

3.4.3.6 Discriminant validity

Discriminant validity concerns a construct and its items in relation to other different constructs; that is, the distinctiveness of a construct from other constructs (Hair et al., 2014). This type of validity requires that a construct and its items should not relate too highly with another distinct construct and its items (Netemeyer et al., 2003). In addition to the CFA, Paper 2 employed the procedure by Fornell and Larcker (1981) where discriminant validity was supported when the square root of the AVE for a construct is greater than the correlation coefficient between that construct and other distinct constructs in the study. For instance, the square root of the AVE for nurse services should be greater than the correlation coefficient between nurse services and doctor services.

3.4.3.7 Predictive validity

Predictive validity, as the name suggests, is the ability of a measure to adequately predict or relate to outcome measures or constructs. This particularly concerns the occurrence of the outcomes subsequently after the initial measure takes place (Netemeyer et al., 2003). For instance, the measure for patient experience is said to have predictive validity if it predicts outcomes such as patient satisfaction significantly, after patients have experienced healthcare. Paper 2 employed ordinary least squares (OLS) regression and Pearson Moment Correlation Coefficients in ascertain the predictive validity of the PEQ with patient satisfaction, health benefits and health level as outcome variables. Paper 3 ascertained the predictive ability of PEQ with HAIs as the outcome variable using latent growth modelling.

3.4.4 Measurement invariance

Measurement invariance offers an adequate way of ensuring that a scale or measure is generalisable (Netemeyer et al., 2003). This test seeks to ascertain whether the measurement model differs across variant groups in a data. The main objective of measurement invariance tests is to achieve little or insignificant variance or differences across different groups within a sample in order to inspire confidence in the ability of the measure to generate accurate responses and assessments across groups (Vandenberg & Lance, 2000). This is important because it ensures that different groups and samples have similar understanding of the same constructs (Byrne, Shavelson, & Muthén, 1989). Also, it helps to remove erroneous conclusions on how effective an intervention is, for example, what constitutes fluency for control and treatment groups (Putnick & Bornstein, 2016).

Measurement invariance tests are usually done in a hierarchical manner based on four stages, from the least strict to the strictest: configural invariance, metric invariance, scalar invariance and residual invariance. Configural invariance focuses on the pattern or structure of the latent factor. For configural invariance to be achieved, the general factor structure for each latent variable must be the same across groups (Putnick & Bornstein, 2016). Thus, the same pattern of fixed and non-fixed parameters must be the same across groups (Netemeyer et al., 2003). For instance, if discharge has two items in group 1 (males), it should have the same two items in group 2 (females) within the sample. In the event of configural noninvariance, some items can be deleted and retested, guided by the data, or assume the construct is basically noninvariant and terminate the measurement invariant testing (Putnick & Bornstein, 2016).

Metric invariance comes after configural invariance is ascertained. This deals with the factor loadings across samples or groups (Netemeyer et al., 2003). For metric invariance to be achieved, the loading of each item/question unto its latent variable must be similar across groups. In other words, the contribution of each item to its factor should be equivalent between groups (Putnick & Bornstein, 2016). For instance, item 1 on doctor services should have the same or similar loading (e.g., 0.82) across the groups. This is done by constraining the factor loadings for all items that achieve configural invariance to be equal across the groups. Then this constrained model is compared to the configural (unconstrained) model. In the event of metric noninvariance, one can unconstrain noninvariant item loadings, delete items with noninvariant loadings and retest, or assume the construct is basically noninvariant and terminate the testing (Putnick & Bornstein, 2016).

Scalar invariance is the next step if metric invariance is supported. This deals with factor variances and covariances across groups (Netemeyer et al., 2003). For scalar invariance to be supported, the item intercepts (means) should be equivalent across group. In that, the mean differences in shared variance of items should be reflected in the mean differences in latent constructs (Putnick & Bornstein, 2016). If an item does not have scalar invariance, it means the difference in means of that item between the groups does not relate to increased/decreased levels of its factor in the groups. For instance, a higher mean for female patients on understanding what their nurses said (item) than male patients should be captured in the overall mean difference in nurse services (latent factor) between males and females. This is done by constraining the intercepts of the metrically invariant items to be equivalent between the groups and comparing to the previous metric model. In the event of scalar noninvariance, one can test and unconstrain noninvariant item intercepts, delete items with noninvariant intercepts and retest, or assume the construct is basically noninvariant (Putnick & Bornstein, 2016).

Residual invariance is the last stage if scalar invariance is achieved. This deals with the individual error terms (residuals) of items across the groups (Netemeyer et al., 2003). For residual invariance to be supported, residuals of items on a factor must be equivalent across groups. Residuals comprise the proportions of an item that is not shared with or explained by its factor plus the measurement error of that item (Putnick & Bornstein, 2016). This is done by constraining the residuals of the items that achieved scalar invariance to be equivalent across the groups. Then this constrained model is compared to the scalar model. In the event of scalar noninvariance, one can test and unconstrain noninvariant item residuals, and retest or assume the construct is basically noninvariant and end the testing (Putnick & Bornstein, 2016).

A full measurement invariance model is one that has achieved invariance in all the four stages (Netemeyer et al., 2003). Full measurement invariance is however quite difficult to achieve in the real world working with data. It has therefore become acceptable to unconstrain some item loadings, item intercepts or both (depending on your investigation) thus resulting in partially invariant measurement factors and models (Byrne et al., 1989).

3.4.5 Latent growth curve modelling (LGCM)

Paper 3 employed a conditional LGCM to assess relationships between the parallel growth rates of patient experience and HAIs. The LGCM is a model that allows for analysing latent or unobserved growth trajectories of entities by assessing repeated observed data on attributes of those entities (Bollen & Curran, 2006). A latent growth model facilitates "the analysis of multiple processes, both parallel and sequential; regressions among growth factors and random effects; growth modelling of factors measured by multiple indicators; and growth modelling as part of a larger latent variable model" (Muthén & Muthén, 1998-2022a, p. 114). This model thus analyses changes within individual entities as well as across entities. It consists of two latent factors; the starting point, known as the intercept; and the growth or change, known as the slope (Bollen & Curran, 2006), which capture changes in the observed data.

For both the intercept and the slope, there are means and variances. Mean intercept is the average starting point across individuals; mean slope is the average rate of change (whether decreasing or increasing) across individuals; intercept variance is the variability or differences among individuals around the mean intercept (starting point); and slope variance is the variability or difference among individuals around the mean slope (average rate of change) within the sample (Bollen & Curran, 2006). A conditional LGCM is one that has either time-invariant predictors or time-varying predictors or both, usually predicting the intercept and slope and an unconditional LGCM is one without these predictors.

A growth model can be developed for one variable or different variables that are believed to change concurrently. Thus, a growth model can accommodate parallel changes on two distinct variables while assessing relationships between these changes (Bollen & Curran, 2006; Muthén & Muthén, 1998-2022a). Paper 3 therefore investigated growth trajectories in overall patient experience scores across hospitals, on one hand, and HAIs scores across hospitals, on the other hand, and at the same time analysed how the latent factors (intercept and slope) of patient experience related with the latent factors of HAIs. Additionally, autoregressions were assessed on the same variables to analyse how previous years predict subsequent years on the same variable.

3.5 Brief overview of the Norwegian health system

The Norwegian health system is one where control is central, but provision of healthcare is distributed across four regional health authorities (RHF) and 27 health enterprises/trusts (Christensen, Lægreid, & Stigen, 2006). The four regional health authorities are: Central Norway RHF, Northern Norway RHF, Southern and Eastern Norway RHF, and Western Norway RHF (Helsedirektoratet, 2022).

These RHFs have the responsibility for ensuring adequate patient treatment, education of practitioners, research and training, and also cover different areas of healthcare delivery such as ambulance, pharmaceutical services, psychiatry, among others (Christensen et al., 2006). The health trusts then operate as subsidiaries under these RHFs.

The last major reform in the Norwegian hospital system occurred in 2002, which resulted in a change of ownership, structure and administration of hospitals. According to Lægreid, Opedal, and Stigen (2005), the 2002 reform resulted in a simultaneous situation of commercialisation, centralisation, and decentralisation of the hospital system in Norway.

Ownership of the hospitals was transferred to the Ministry of Health while creating management responsibilities for the hospitals at the local level, and furthermore shifted the form of the hospitals from public administration to regional health enterprises, resulting in a challenge of balance between local hospitals' autonomy and central government ownership (Christensen et al., 2006). Although financing for most hospital activities were maintained, some resources are allocated to regional health enterprises and their hospitals based on performance issues such as types of diseases cured, creating some level of competition (Christensen et al., 2006).

A national patient experience programme in Norway has also been designed to accurately measure patient experiences, provide data for enhancing healthcare quality and hospital choice as well as to promote public accountability. This programme has churned out significant research on patient-reported experiences, its measurements, and relationship with outcomes (e.g., Bjertnaes et al., 2014; Bjertnaes et al., 2012; Sjetne, Bjertnaes, Olsen, Iversen, & Bukholm, 2011; Sjetne, Veenstra, & Stavem, 2007), spearheaded by the Norwegian Institute of Public Health (NIPH), formerly named the Norwegian Knowledge Centre for the Health Services.

Johannessen, Kittelsen, and Hagen (2017) however noted that despite the 2002 reform, physician productivity has not improved and there are significant differences across hospital productivity showing huge potential for improvement in Norway. Seeing that patient experience is a quality healthcare measure, and patients' views of caregiving are essential in enhancing hospital productivity, more studies from patients' perspectives are needed as yardsticks in assessing hospital productivity and overall healthcare quality.

4 Summary of results from papers

This chapter presents a summary of each of the three research papers that this thesis entails. Each paper is written in an article format for different peer-reviewed journals, but they connect to meet the overall purpose and research questions in this thesis.

4.1 Paper 1: How does patient-reported experience sit within the healthcare quality literature?

The main goal of this paper was to make a descriptive synthesis of studies on the relationships among patient experience, organisational climate factors, and patient outcomes. This was intended to draw informed conclusions on the general directions and theoretical underpinnings as well as propose a quality-oriented care climate framework. Specifically, this review sought to ascertain the main directions, dominant methods, and theories on the associations among these concepts and consequently make recommendations for research and theory development.

The final list of included articles consisted of 220 studies, and out of this, 118 of them were conducted primarily in the USA. The other studies were conducted in China, Europe, Africa, and Australia. The studies were also characterised by use of various designs with majority of them using cross-sectional design. Data sources used were both primary and secondary. The analytical approaches also ranged from various parametric to non-parametric tests and the studies also employed samples at individual and/or hospital, team, unit levels ranging from below 100 participants to thousands of participants. An interactive mapping of study contexts/locations against designs employed and segmented according to the variables under study is presented in this paper as Appendix B, to give a detailed overview of the studies included.

The first finding was on the variables and factors that the studies focused on. Organisational climate factors were both tangible such as hospital infrastructure, and intangible ones such as teamwork. Patient experience dimensions included doctor and nurse communication, information sharing, and quality improvement programmes while patient outcomes ranged from subjective outcomes such as patient satisfaction to objective outcomes such as patient falls, and hospital mortality rate.

The second finding was the overview of associations among the three concepts. The review showed that generally, majority of the relationships were positive and conclusive. Thus, there were more positive than negative relationships between organisational climate factors and patient experience, patient experience and patient outcomes, organisational climate factors and patient outcomes as well as among all three concepts.

There were also some studies on comparisons between groups such as private against public hospitals, large, medium and small sized hospitals, board sizes, status of accreditation, magnet versus non-magnet hospitals (mark of nurse excellence), mergers and acquisitions, teaching/university versus non-teaching/non-university hospitals, Lesbian Gay Bisexual and Transgender (LGBT)-affiliated hospitals versus non-affiliated ones. While some such as magnet hospital comparisons were conclusive, others such as hospitals sizes were inconclusive.

The next finding focused on the forms of interventions. The interventions took the forms of overlaps between tangible and intangible ones. The interventions included system, logistics and structure redesigns or upgrade, bedside rounds, communication and collaboration, IT, among others. In most of these studies, the interventions achieved their desired effects on patient experiences and on outcomes such as hospitalisation, patient satisfaction, 30-day readmission, and hospital acquired conditions.

Lastly, many studies did not employ any underpinning theory. However, the majority of the studies that employed a theory used the Donabedian framework for assessing healthcare quality. A few studies also used the SERVQUAL model and expectancy-disconfirmation theory for assessing service quality gaps. Other studies employed theories from organisation and management disciplines such as contingency theory, structural contingency theory, attribution theory, SDT, service fairness and resource-based view (RBV). Self-developed conceptual frameworks were also used by some studies to illustrate the hypothesised relationships among variables or explain an adapted framework.

4.2 Paper 2: What is the extent of validity and reliability of a patient experience measure?

The main purpose of this paper was to test the psychometric qualities of the PEQ, thereby validating a measurement model. This was geared towards ensuring that this measure's performance is still adequate after being employed several times by the NIPH to gather data on patient experiences. The paper therefore employed survey data gathered by the NIPH from adult inpatients at somatic hospitals in the Health South-East RHF in Norway.

The complete number of questionnaires returned was 4603 out of a total of 8381 patients. The sample was characterized by a somewhat fair age distribution of patients across three age groups: 60 years and below, from 61 years to 73 years, and 74 years and above. Most of the respondents were admitted for three or fewer days, and more of them were also admitted to the medical department compared to the surgical department.

The initial CFA model that was developed showed acceptable fitness to the data and the 8-multidimension factor structure of patient experience. However, there was still the need to modify and improve the model. Configural and metric invariances were achieved for this model but not scalar and residual invariances thereby resulting in partial invariance. Reliability using CR values were also achieved for all 8 dimensions of patient experience.

With the exception of the standard dimension, convergent validity using AVE values was ascertained for all dimensions. Construct validity was also ascertained using factor loadings of items while predictive validity was achieved for the measure. However, four of the dimensions, namely, doctor services, nurse services, information and organisation, had discriminant validity concerns and overlaps amongst them. As such, a model was proposed including a second-order factor for these four dimensions. The second-order factor was named "treatment services" and this proposed model met all fitness and validity requirements.

4.3 Paper 3: To what extent is patient experience relevant for the other pillars of healthcare quality?

The main purpose of this study was to use data from the Norwegian health industry to examine the parallel relationships between the growth rates of patient-reported experiences and HAIs over time. The main research question for this paper was: To what extent do changes in patient experience relate with changes in HAIs among hospitals in Norway over time?

The study sought to make the following contributions: first, to examine general trends in patient-reported experiences and HAIs, separately, across the hospitals over time in Norway. Secondly, to ascertain relationships between patient-reported experiences and HAIs from starting points across hospitals over time. Thirdly, to examine lagged effects on waves of patient-reported experience and HAIs separately. Lastly, to ascertain the predictive validity of the patient-reported experience tool used in gathering data from these hospitals over time by testing the relationship with HAIs as outcomes.

The findings showed that for both patient experiences and HAIs, hospitals that recorded higher scores at the starting point experienced a lower growth rate overtime compared to hospitals that recorded lower infections at the starting point. Secondly, it was found that the starting point for patient experience significantly related to the starting point for HAIs, such that, the higher the score for patient experience, the lower the score on infections across hospitals.

Furthermore, the starting point for patient experience related significantly with the growth rate for HAIs, such that, the higher the score for patient experience at time zero, the higher the rate of change (increase) on infections across hospitals. Practically, hospitals that scored high on patient experience at the start most likely recorded a higher growth/change rate on hospital-associated infections over time because they also scored low on hospital-associated infections at the start, as seen in the first finding.

The third finding indicated that almost all lagged effects on either patient-reported experience or HAIs were significant. Lastly, the findings ascertained the predictive validity of the patient-reported experience measure as a significant predictor of HAIs over time.

5 Discussion and theoretical implications

The discussion in this thesis is presented under three broad themes: (i) scope of patient experience in healthcare quality literature, (ii) patient experience measurement in healthcare quality, and (iii) relevance of patient experience for patient outcomes. The chapter then ends with a theoretical discussion, making a case for quality care climate.

5.1 Scope of patient experience in healthcare quality literature

In Paper 1, it was shown that the epistemology of patient experience within the healthcare quality literature has developed considerably over the past 15 years. The study found that associations among patient experience, organisational climate factors, and patient outcomes were conclusive. This is contrary to the assertion in the systematic review by MacDavitt et al. (2007) that associations between organisational climate factors and patient-related variables, such as patient experience, were not as robust as the associations between organisational climate factors and nurse outcomes.

The results in Paper 1 thus boosts the confidence in the concept of patient experience as one that has relevant implications for healthcare quality as it was seen that majority of the reviewed studies showed positive associations between patient experience and organisational climate factors (e.g., Bachnick, Ausserhofer, Baernholdt, Simon, &

Group, 2018; Beauvais et al., 2020; Nembhard, Yuan, Shabanova, & Cleary, 2015) and between patient experience and patient outcomes (e.g., Addo, Mykletun, & Olsen, 2021a; Asagbra, Burke, & Liang, 2019; Chumbler, Otani, Desai, Herrmann, & Kurz, 2016). The findings in Paper 1 also show the positioning of patient experience as the main focus in integrated care and healthcare quality. In the paper, organisational climate factors are seen to relate with and possibly influence patient experience, and patient experience are, in turn, seen to relate with and possibly influence patient outcomes (e.g., Dobrzykowski, Callaway, & Vonderembse, 2015; Real et al., 2020).

According to WHO (2006a), the building blocks for a healthcare system are service delivery, health workforce, information, medical products, vaccines and technologies, financing, and lastly, leadership and governance. These building blocks have been shown in Paper 1 as having significant relationships with patient-reported experience, such that when they focus on the patients, favourable outcomes such as responsiveness and improved health would develop for patients. Of greater importance is that fact that perceptions of the organisational climate factors from patients were included in the paper. This shows that although patients may not have the requisite skills and knowledge of the hospital environment, their experience of this environment should, in no way, be downplayed as it holds relevance for improving outcomes and overall healthcare quality.

Other important points in the scope of patient experience are the issue of comparisons across different groups, and the forms of interventions found in Paper 1. The comparisons concerned patients' reports of their experiences based on certain hospitals characteristics, and interventions focused on patients' reports of their experiences before and after their introductions.

Comparisons were made based on issues such as hospital sizes. For example, while some studies found that smaller hospitals were rated higher on patient experiences than medium and larger hospitals (e.g., Sjetne et al., 2007), others found that larger hospitals scored better on patient experience than smaller hospitals (e.g., Hu et al., 2020). Other basis of comparisons were teaching versus non-teaching hospitals (e.g., Nemati, Bahreini, Pouladi, Mirzaei, & Mehboodi, 2020; Wray et al., 2016), LGBT-affiliated hospitals versus non-affiliated hospitals (DiLeo, Borkowski, O'Connor, Datti, & Weech-Maldonado, 2020), among others.

Regarding interventions, several interventions overlapping between tangible and intangible ones with the aim of improving patient experiences were identified in Paper 1 (e.g., Chan et al., 2015; Dunn et al., 2017; Monash et al., 2017). In all these studies of comparisons and interventions, the patients were at the centre and the main focus, buttressing the importance of patient-centredness for improving healthcare quality and entrenching the position of patient experience in the healthcare quality literature.

In congruence with this, Busse et al. (2019) assessed attributes in 10 popular definitions of healthcare quality and identified patient-centredness, responsiveness, or focus on patients as prominent in 9 of the definitions. Thus, any intervention to improve healthcare quality should place premium on patients, and their perspectives and experiences must be sought primarily. This would ensure continued collaboration and integrated care (Joober et al., 2018; Singer et al., 2011). To put this succinctly, healthcare providers that focus solely on healthcare professionals rather than both patients and practitioners often reduce their potential to adequately improve healthcare quality (Kennedy et al., 2014).

Lastly, the results from Paper 1 also promote the proposition of patient experience principles as essential for healthcare quality. Patient experience comprises norms and values such as responsiveness, trust, patient participation, patient engagement, among others (Oben, 2020; Snyder & Fletcher, 2020; Wolf & Jason, 2014). The results showed that these norms and values related well with organisational factors, and were adequately situated within the healthcare quality literature, as having the potential to enhance outcomes. Patients perceived these values and norms under patient experience as an indication of proper caregiving process. Therefore, healthcare quality becomes legitimised in the eyes of patients by these principles underlying patient experience and any hospital seen to be upholding them would be deemed acceptable.

5.2 Patient experience measurement in healthcare quality

In Paper 2 and Paper 3, the results showed that the concept of patient experience has adequate measurement performance with some room for improvement. Paper 2 showed that the PEQ had a good factor structure, ascertained reliability, construct validity, convergent validity as well as predictive validity. Paper 3, similarly, showed that the patient experience measure had good predictive validity over time.

These results answer the calls on the need to intensify patient experience surveys, subject to well performing instruments and measures (Haugum et al., 2014; Manary et al., 2013). This also enhances the assertion of Loiselle et al. (2019) that accurate documentation of patient experiences is imperative for promoting the literature and discourse of patient experiences. Indeed, Manary et al. (2013) maintained that to elicit accurate information on experiences of healthcare from patients, robust measurements of patient experiences should be developed.

According to Netemeyer et al. (2003), developing and maintaining good measures in social science research is particularly important for a number of reasons. First is that it promotes objectivity in social science research. Objectivity in social science is difficult to achieve considering the focus on attitudes, perceptions and experiences of humans which are highly subjective and unstable. As such, developing measures that are standardised ensures that different researchers in social sciences can fall on the same standards to conduct research in a reliable manner. Another importance is that standardised measures provide ease as they enable quantification of variables which enhances generalisation and communication (Netemeyer et al., 2003).

In the same vein, adequate measures for patient experience boosts the objectivity in its research, considering the subjective nature of these reported experiences. This enhances the robustness of the concept as a pillar of healthcare quality. Healthcare quality is not exclusive to a region or country, but it is a general goal of all healthcare systems worldwide, which can be improved by generating accurate information on how patients experience healthcare (Addo et al., 2021a). Thus, if patient experience is to be touted as arguably the most important pillar in healthcare quality, it should be easy to assess, and results from its assessments should be reliable and valid enough for improving healthcare quality.

The results from the three papers also support the nomological validity and predictive validity of patient experience. Nomological validity concerns the position and operation of a variable or concept within a network of relationships with other variables and concepts (Netemeyer et al., 2003). Paper 1 showed that patient experience is a consequent of organisational factors while all three papers proved that patient experience is an antecedent of patient outcomes. Paper 2 ascertained the predictive validity of the dimensions under patient experience while Paper 3 ascertained the predictive validity of the overall patient experience measure. This shows that the patient experience concept is gaining strong establishment in the overall healthcare literature, and researchers’ confidence in studies employing its measures has increased over the years.

Despite the results from Paper 2 ascertaining reliability and validity of the PEQ to a good extent, some issues needed to be addressed and improved. The major issues were discriminant validity and measurement invariance. Discriminant validity issues were recorded for about four dimensions of patient experience: doctor services, nurse services, information and organisation. As such, a second-order factor, named treatment services, was developed for these four dimensions and the results showed adequate improvement in discriminant validity (Addo et al., 2021a).

Regarding measurement invariance, the PEQ failed to achieve scalar invariance, after configural and metric invariances were achieved; and as such, the invariance test was discontinued (Putnick & Bornstein, 2016). These issues confirm the assertion that patient experience measures are potentially affected by contextual factors that change over time (Haugum et al., 2014) affecting the performance of PREMs. This is not surprising considering the highly dynamic nature of the health industry and the ever-increasing rate of illnesses (Chiou et al., 2019; Pitter et al., 2019). Therefore, it is imperative that researchers and practitioners constantly monitor the performance of these PREMs so as to ensure maximum confidence in the information that they elicit, if the concept of patient experience is to remain central to healthcare quality.

5.3 Relevance of patient experience for patient outcomes

All the three papers in this study confirmed the relevance of patient experience for patient outcomes. Paper 1 highlighted the theoretical relationship between the two concepts in the healthcare literature while Paper 2 and Paper 3 confirmed this relationship empirically. In Paper 2, patient experience dimensions were found to significantly, and positively relate with the patient-reported outcomes, namely patient satisfaction, health benefits, and health level. This is in line with previous findings (e.g., Bjertnaes et al., 2012; Blazquez, Ferrandiz, Caballero, Corchon, & Juarez-Vela, 2019; Bleich et al., 2009; Griffith, Li, Davies, Pizer, & Prentice, 2019). Of greater relevance is that fact that in Paper 3, patient experience is seen to relate with HAIs over time. HAI is seen as a clinical outcome that is devoid of patient subjectivity and is not necessarily reported directly by patients. This finding is similar to findings in related studies (Kennedy et al., 2014; Sacks et al., 2015).

These findings are essential to the discourse on patient experience because they indicate convincingly that the concept has relevance for both patient-reported outcomes and clinical outcomes. As highlighted in the health system framework by WHO (2006a), quality is seen as an intermediate goal of the health system with the ultimate goals being improved health of patients, responsiveness, financial protection and improved efficiency. Basically, healthcare quality, embodied in patient experience, should have implications for the outcomes of patients. These findings also buttress the assertion by Doyle et al. (2013) that patient experience is a pillar of healthcare quality that serves as a utilitarian measure by which clinical effectiveness and safety in hospitals can be enhanced.

In the case of Paper 3, patient experience is seen to significantly relate with an indicator of hospital effectiveness and safety, which is HAIs. This stresses the importance of making the patient the main focus in improving healthcare. Indeed, if patient experience is to tackle the notion that patients are not equipped with adequate knowledge and skills to assess healthcare quality (Manary et al., 2013), the reports of their experiences should reflect factors and outcomes with real-life implications that are devoid of their perceptions. Thus, more weight should be given to these reported experiences by patients, as it has been shown to have essence for healthcare quality.

This thesis is by no means declaring patient-reported experience as a perfect and only way to improve patient outcomes and other pillars of healthcare quality. Indeed, the concerns among researchers pointed out by Manary et al. (2013) that patients may not possess adequate knowledge to properly assess healthcare is valid. The complex and dynamic nature of the health industry makes this concern the more critical as several factors could impact patient experience and outcomes other than the hospital environment. What this thesis says is, basically, that a focus on improving patient experience of healthcare is a significant way to improve their outcomes, healthcare quality and the entire health system. The findings of this thesis attest to this.

5.4 Theoretical implications and the case for 'quality care' climate

This thesis buttresses the linkage between perceptions and experiences espoused earlier. Patients reported and rated their experiences and outcomes of healthcare based on how they perceived the caregiving process and the hospital environment. Démuth (2013) succinctly put it that humans live in a world of perceptions and a study of the world is merely a study of perceptions, presenting a unique source of how we experience things. These perceptions of patients could therefore be direct, as Gibson (1979) explained, as well as constructive, as explained by Gregory (1990).

Based on Gibson's theory, patients form perceptions about the hospital environment and care based on their positions; for instance, which departments they visit, the required treatment processes as well as the infrastructure, and this also informs patients of the functionalities of these hospital aspects. They then report these perceptions as their experiences of the hospital standards, organisation, doctor and nurse services, among others.

Similar to Gregory's view, patients go through a process of interacting with the hospital environment, evaluation and interpretation of the functioning of these factors based on their previous knowledge and experiences. As such, patients would report their experiences based on perceptions about the dimensions of the hospitals against the backdrop of what they know and expect. Furthermore, patients would infer and interpret their reported outcomes from these experiences.

The psychometric methods and testing done in this thesis presents good implications for the development of the patient experience literature. Understanding how to measure concrete or abstract phenomena is needed to better understand those phenomena (Olsen, 2009). The results in the second paper suggest strongly that overlaps exist among the dimensions of patient experience, and any attempt to measure the multidimensional nature of the concept adequately should acknowledge and deal with these overlaps. This is needed for reliable and valid epistemological development in the field. Psychometric methods also have implications for theory development. Seeing that theories bordering on patient experience are less developed, attempts to build theories that assess patient experience in relation to other concepts should endeavour to consider the interrelationships that underlie the concept.

The findings in the first paper give an essential theoretical contribution to the current body of literature. This thesis has established that associations among patient experience, patient outcomes, and organisational climate factors are conclusive. This clears any confusion regarding the interplay of these concepts in the hospital setting. More theoretical contribution is also seen in the relationship between patient experience and HAIs (an objective outcome) to show relevance of patient experience for different types of patient outcomes.

The use of the longitudinal analysis, specifically, the latent growth curve model with autoregresssions, in the Paper 3 also presents some unique contributions. The choice of this model, in comparison with other longitudinal models, gave a good indication of how best to examine the relationships between patient experience and HAIs over time. This model also enabled the capturing of relevant factors, latent or observed, that relate to the changes within and across the hospitals. This is particularly essential as the health sector is a rapidly changing one with several interrelated factors that may influence outcomes over time.

According to Muthén and Muthén (1998-2022a), latent growth curves facilitate the assessment of how entities develop over time with regard to concepts and variables. Since factors such as types of illnesses, staff expertise, types of patients, treatments, among others, differ from one hospital to another, it is important that the longitudinal analysis aids in capturing these individual hospital differences regarding their performances on patient experience and HAIs. A good assessment should consider this, and it is not surprising that this model was the best, in comparison to the other models.

Furthermore, the results in this thesis also present avenues for theoretical propositions. The results in the first paper affirm the theoretical positioning of patient experience within the broad healthcare literature. Patients report their experiences in relation to perceptions they form about the hospital environment which can influence their outcomes. A critical look at this would show that factors in the hospitals encompass the existing climate. To buttress the earlier argument made in this thesis, patients' reports of their experiences represent a lens through which their interactions and perceptions of the existing hospital climates are expressed. What kind of climate would this be?

Considering the lack of adequate quality-oriented organisational climates in hospitals (Nembhard et al., 2012), this thesis proposes the development of the 'quality care' climate as an aspect of organisational climate that focuses on the caregiving process and infrastructure responsible for improving healthcare quality. This quality care climate is explained as the collective experiences of patients formed from their perceptions and continued interactions with hospital factors and environment such as physical structures, information flow, communication and organisation, practitioner services, discharge, among others, responsible for ensuring adequate treatment and healthcare quality.

The theoretical development of this would have to address two main (non-exhaustive) issues. The first issue is the overlaps and interrelationships between and among the dimensions under patient experience. The quality care climate should have tenets which encompass these overlaps or at least proffer ways to conceptualise these overlaps. To deal with this, Paper 2 proposed a second-order factor for the overlapping dimensions and named it 'treatment services.' Further developments in this line could focus on determining the dimensions that show frequent overlaps so as to effectively conceptualise these overlaps. The second issue would be how to increase the knowledge and understanding of patients regarding the hospital environment. To deal with the second issue, the advancement of coproduced health system (Batalden, 2018) with collaborations between patients and practitioners is integral. By this, practitioners would give adequate support and education so as to boost patient knowledge and confidence. Further developments could then focus on the extent of knowledge and skills needed by patients to adequately perceive and report the quality care climate of hospitals.

6 Recommendations, conclusion and directions for future research

This chapter answers the “so what” question by highlighting the nouvelle contributions of this thesis and giving practical/managerial implications. The chapter also presents recommendations to healthcare providers, practitioners and patients, as well as recommendations to policymakers for improving healthcare quality. The chapter then concludes the thesis and presents its limitations together with directions for future research.

6.1 Nouvelle contributions

The results from this thesis present some nouvelle contributions. First, this thesis considers organisational climate factors from both users’ and employees’ perspectives within the hospital setting. The review (Paper 1) focused on perceptions of organisational climate factors both from patients and hospital employees and their associations with patient experience and patient outcomes, thereby establishing the conclusiveness of these associations. Secondly, the study is the first to propose the development of the quality care climate theory which would be an aspect of organisational climate in hospitals, perceived and reported by patients. Lastly, the study is the first to propose a second-order factor in a measurement model for overlapping dimensions under patient experience, providing an improved theoretical understanding of how patient experience dimensions are interrelated. This thesis gives a strong indication of the existence of these overlaps as well as a way to deal with them when conducting psychometric assessments on PREMs.

6.2 Practical/Managerial implications

The results of this study clearly indicate the extent to which patient-reported experience is important for improving healthcare quality. By focusing on patients and being responsive to their experiences and outcomes, hospitals and healthcare providers can generally maintain and increase favourable outcomes for patients such as better patient satisfaction and lower HAIs. This would promote healthcare quality and improve the health system in areas such as increased responsiveness, and improved efficiency. Thus, for these healthcare providers, patients' perspectives of the existing conditions become an essential component and tool for their operations. Through the lens of patients, hospitals can significantly augment their knowledge of the health environment and the existing climate.

Furthermore, the study shows that accurate measurement of patient experience is imperative to better understand this existing climate in hospitals. The quality care climate is therefore a focus on the patient's experiences and perspectives of the tangible and intangible parts of the caregiving process (e.g., structure and process), supported by reliable and valid measurements, enhanced by the support given by healthcare providers, and geared towards improving patients' outcomes and health as well as the health system. As such, hospitals and healthcare providers must endeavour to help increase patients' education and promote patient knowledge of the existing climate towards maintaining a coproduced health system. This would help providers to uphold values and norms, and act in ways that are deemed acceptable in the bid to improve healthcare quality.

Improvements in patient experience and overall healthcare quality should also be pursued systematically. This means that certain factors must be ensured. According to Konsmo et al. (2015) some prerequisites are needed for systematic implementation of quality improvement programmes: (i) top management support, employee and organisational engagement; (ii) monitoring of quality levels to detect actual changes; and (iii) employee training in work and involvement of patients.

Specifically, the study makes the following recommendations to healthcare providers, practitioners, and patients for improving healthcare quality:

- Hospital management and boards should pursue patient experience improvement strictly by continuously giving adequate support for both short-term and long-term intervention programmes.
- Hospital management must also ensure a multilevel approach to implementation where the purpose, support and engagement for programmes are sought from each organisational level (from top managers to the sharp ends of healthcare practitioners and

providers). This would help the employees believe in and accept the importance of such programmes and increase their commitment towards implementing them.

- Top management in hospitals should also have concrete guidelines for implementing and assessing the impact of programmes. They could employ the five stages proposed by Konsmo et al. (2015): prepare, plan, perform, evaluate, and follow up. This would help them to effectively implement and continually monitor the impact of programmes on the experience of patients and overall healthcare quality.
- Healthcare providers should ensure that the existing conditions, procedures and practices of caregiving are implemented with the patient as the focus. This can create hospital climates that revolve around the patients which is essential for improving healthcare quality.
- Hospitals and healthcare providers should also endeavour to enhance collaboration with patients by increasingly supporting and educating patients. A co-produced health system between practitioners and patients is considered important for healthcare quality since it fosters network and promotes patient participation as well as professional development (Batalden, 2018). As such, healthcare practitioners, in their daily encounters with patients, should encourage patients to share their views on the caregiving process and take these views into consideration. This would boost

the confidence of patients to constantly collaborate with practitioners and make informed choices.

- Healthcare providers and researchers should collaborate to further investigate interventions that border on issues such as bedside rounds, music and massage therapy, and noise reduction, as these were found in the first paper to have inconclusive effects on patient experience and patient outcomes.
- From a service management perspective, this thesis shows the importance of customer opinions for improving service, especially in a volatile environment as the health industry. In order to improve health service for better healthcare quality, healthcare providers should frequently seek feedback from patients. Hospitals could conduct their own surveys with their patients on their experiences for comparisons with their performances in national surveys.
- Furthermore, hospitals and providers should frequently organise adequate training programmes for their practitioners on ways to encourage patient participation, patient engagement and motivations for patients to comply with guidelines in the caregiving process.
- Lastly, patients should have in mind that the healthcare system and caregiving process exist to improve their outcomes and general health. As such, they should endeavour to collaborate effectively with healthcare practitioners and adhere to guidelines

and recommendations towards improving overall healthcare quality.

6.3 Policy recommendations

Based on the results, this thesis makes the following recommendations for policy:

- National policymakers in Norway and other countries should ensure that periodic assessments and validations of PREMs are sanctioned. Similar to the national surveys using these PREMs, the performance of these PREMs should also be of national concern to policymakers so as to ensure that accurate and reliable information is being obtained from the patient experience surveys.
- Secondly, together with the national surveys, there could be qualitative as well as intervention studies at the national level. This could be across hospitals, and geared towards improving patient experiences, participation, and outcomes to augment quantitative results. This can help in maintaining a coproduced health system and improved healthcare quality.
- Additionally, the thesis supports using more incentives for hospitals and practitioners that are tied to patient experiences, participation and empowerment so as to encourage these hospitals to engage more in these principles. Incentives such as

extra infrastructural rewards, national award and recognition, among others, could be implemented.

- Policymakers should also insist on hospitals' and healthcare providers' usage of results from national surveys in their improvement programmes. For instance, findings on next of kin experiences in the second paper seemed underwhelming. Thus, policymakers could insist on hospitals showing proof of implementing or incorporating programmes geared towards improving next of kin experiences in their daily routines of hospital care.

6.4 Conclusion

In a nutshell, this thesis ascertains the relevance of patient experience for healthcare quality and its improvement. The thesis contributes to the epistemology of patient experience in three main ways. First, it shows the theoretical positioning of patient experience within the healthcare quality literature. Secondly, it establishes the reliability and validity of patient experience measures thus buttressing the ability of the concept to generate accurate information on healthcare and the caregiving processes and structures from patients. Lastly, the thesis shows that patient experience has implications for not only the subjective patient-reported outcomes such as satisfaction but also for more objective, clinical outcomes such as hospital-associated infections.

This therefore buttresses the assertion that patient experience represents a utilitarian conduit for improving clinical effectiveness and safety, the other two pillars of healthcare quality. As such, patients should be given adequate support and confidence to collaborate effectively with healthcare providers and practitioners in improving patient outcomes and the overall health system. National and hospital policymakers should endeavour to make patients the focus and centre of any attempt to improve healthcare quality through seeking their participation as well as their reliable and valid experiences of the caregiving process and structure, which are vivid representations of existing quality care climate in these hospitals.

6.5 Limitations of the study

This thesis was not devoid of limitations. The first limitation is the empirical focus on Norway which may limit the ability to generalise the findings of Paper 2 and Paper 3 to other countries. Nonetheless, the first paper, which was a review, was not limited to any geographical location thus boosting the generalisability of those findings.

The second limitation regards the use of quantitative data for Paper 2 and Paper 3. This limits the ability of the thesis to draw out the contextual understanding for the quantitative findings. The use of qualitative methods would give more understanding about the context and also add knowledge to the use of patient narratives about their experiences of hospital care.

The third limitation is that the relationship between the proposed measurement model in the second paper and objective patient outcomes was not tested in the third paper. The third paper took a unidimensional rather than a multidimensional view of patient experience. Although the reasons for the selected approach have been espoused under the methodology section, it presented some limitation to expanding the knowledge on the multidimensional nature of the concept. That notwithstanding, the third paper presents relevant insights into the usefulness of patient experience as an overall indicator since it related to future performance of health care systems.

Furthermore, the review paper was limited by its focus on only quantitative studies and peer-reviewed articles. Other studies such as qualitative studies and unpublished studies could have had some different or complementary implications for the findings. That notwithstanding, the review paper entailed an extensive and well-guided search in well recognised journal databases.

Additionally, the third paper was limited by the sample size of the hospitals as a larger sample size would have been desirable. However, considering the Norwegian context, this limitation was beyond the study's control, as Norway is a sparsely populated country with much less hospitals than other densely populated countries. Nonetheless, at the individual level, about 400 patients were sampled each year for each hospital, which boosts the power of the sample.

Moreover, the second paper validated a PREM using cross-sectional data. This presented possible issues such as common method bias which could have influenced results such as the criterion-related validity of patient experience on patient outcomes. That notwithstanding, this is one of the reasons for employing different psychometric testing principles, some of which are used in the second paper of this thesis. The last limitation is that the thesis did not focus on interventions of patient experience for improving outcomes.

6.6 Directions for future studies

Based on the limitations, this thesis makes some recommendations for future studies. Future studies could replicate the second and third papers in this thesis in different, multiple contexts for comparisons as well as with larger samples. Secondly, future research should analyse primary, qualitative data to establish underlying reasons and explanations for the quantitative results in this thesis. Thirdly, more studies should zoom in on the relationships between patient experience dimensions and objective patient outcomes to gain insights on the contributions of each dimension towards these outcomes over time. Future systematic review papers on the concepts in the first paper could also incorporate other types of studies other than only quantitative, peer-reviewed ones. This would strengthen the results in this thesis. Additionally, future research on validating PREMs should take a longitudinal approach in order to deal with any potential common method bias that may be associated with the cross-sectional design. Moreover, more focus should be put on interventions of patient experiences with hospital structure and processes that influence patient outcomes on a larger scale, at various levels (within hospitals, at the hospital level, and possibly also at the national level across hospitals). Lastly, future studies should delve further into developing theoretical underpinnings of patient experience by building on the quality care climate proposition.

6.7 Personal reflections

It is important to be critical of the significance and limits of patient experience for quality healthcare. Surely, patients do not possess the level of skills and knowledge of healthcare and the hospital environment that practitioners are privy to. As such, there might be some misinterpretations of the hospital factors and environment as experienced by patients which could influence their reports of their experiences and outcomes.

Also, given that patient experience is subjective and could be influenced by other factors external to healthcare and the hospital environment, there could be reasonable concerns regarding its measurement. This subjective nature will continue to pose challenges to patient experience and its implications for patient outcomes. Nonetheless, this subjectivity is a common challenge with social science concepts and therefore does not undermine the relevance of this thesis. That is why psychometric testing criteria and principles are important in social science, and the need for strictness when assessing validity and reliability of social science concepts.

The focus on improving patient experience requires extensive resources and a great deal of investment. The financial commitment is undoubtedly needed. However, another key factor would be adequate hospital top management support for programmes and interventions towards improving healthcare quality in hospitals across all levels over time.

Furthermore, patience on the part of healthcare providers and practitioners is essential for improvement programmes. With today's technological and educational advancement, patients can be quite knowledgeable, and very demanding. The onus lies on hospitals to manage these demands and adequately tap into the knowledge of these patients in enhancing their experiences and outcomes.

In all, the reports of patient experience are essential for improving healthcare quality and thus, we must instil enough confidence in what patients perceive and say, subject to scientific validation. This should therefore be done with adequate collaboration and support from practitioners, and appropriate research to churn out accurate information towards improving patient outcomes, healthcare quality, and the healthcare system.

7 References

Addo, S. A., Mykletun, R. J., & Olsen, E. (2021a). Validation and Adjustment of the Patient Experience Questionnaire (PEQ): A Regional Hospital Study in Norway. *International Journal of Environmental Research and Public Health, 18*(13), 7141. Retrieved from https://www.mdpi.com/1660-4601/18/13/7141

Ahern, M., Dean, C. M., Dear, B. F., Willcock, S. M., & Hush, J. M. (2019). The experiences and needs of people seeking primary care for low-back pain in Australia. *Pain Reports, 4*(4).

Asagbra, O. E., Burke, D., & Liang, H. (2019). The association between patient engagement HIT functionalities and quality of care: Does more mean better? *International Journal of Medical Informatics, 130*, 103893.

Ashforth, B. E. (1985). Climate formation: Issues and extensions. *Academy of management review, 10*(4), 837-847.

Bachnick, S., Ausserhofer, D., Baernholdt, M., Simon, M., & Group, M. R. S. (2018). Patient-centered care, nurse work environment and implicit rationing of nursing care in Swiss acute care hospitals: A cross-sectional multi-center study. *International journal of nursing studies, 81*, 98-106.

Baker, A. (2001). *Crossing the quality chasm: a new health system for the 21st century* (Vol. 323): British Medical Journal Publishing Group.

Batalden, P. (2018). Getting more health from healthcare: quality improvement must acknowledge patient coproduction—an essay by Paul Batalden. *BMJ, 362*, k3617. doi:10.1136/bmj.k3617

Beauvais, B., Gilson, G., Schwab, S., Jaccaud, B., Pearce, T., & Holmes, T. (2020). *Overpriced? Are Hospital Prices Associated with the Quality of Care?* Paper presented at the Healthcare.

Bjertnaes, O., Deilkås, E. T., Skudal, K. E., Iversen, H. H., & Bjerkan, A. M. (2014). The association between patient-reported incidents in hospitals and estimated rates of patient harm. *International Journal for Quality in Health Care, 27*(1), 26-30.

Bjertnaes, O., Iversen, H. H., Skyrud, K. D., & Danielsen, K. (2019). The value of Facebook in nation-wide hospital quality assessment: a national mixed-methods study in Norway. *BMJ quality & safety*, bmjqs-2019-009456.

Bjertnaes, O., Sjetne, I. S., & Iversen, H. H. (2012). Overall patient satisfaction with hospitals: effects of patient-reported experiences and fulfilment of expectations. *BMJ Qual Saf, 21*(1), 39-46. Retrieved from https://qualitysafety.bmj.com/content/qhc/21/1/39.full.pdf

Bjertnaes, O. A. (2013). Patient-reported experiences with hospitals: comparison of proxy and patient scores using propensity-score matching. *International journal for quality in health care, 26*(1), 34-40.

Blazquez, R. A., Ferrandiz, E. F., Caballero, V. G., Corchon, S., & Juarez-Vela, R. (2019). Women's satisfaction with maternity care during preterm birth. *Birth*.

Bleich, S. N., Özaltin, E., & Murray, C. J. (2009). How does satisfaction with the health-care system relate to patient experience? *Bulletin of the World Health Organization, 87*, 271-278.

Bollen, K. A., & Curran, P. J. (2006). *Latent curve models: A structural equation perspective*: John Wiley & Sons.

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative research in psychology, 3*(2), 77-101.

Busse, R., Panteli, D., & Quentin, W. (2019). An introduction to healthcare quality: defining and explaining its role in health systems. *Improving healthcare quality in Europe*, 1.

Byrne, B. M., Shavelson, R., & Muthén, B. O. (1989). Testing for equivalence of factor covariance and mean structures: The issue of partial measurement invariance. . *Psychological Bulletin, 105*, 456-466. doi:DOI: 10.1037/0033-2909.105.3.456.

Chan, B., Goldman, L. E., Sarkar, U., Schneidermann, M., Kessell, E., Guzman, D., . . . Kushel, M. (2015). The effect of a care transition intervention on the patient experience of older multi-lingual adults in the safety net: results of a randomized controlled trial. *Journal of general internal medicine, 30*(12), 1788-1794.

Chen, X., Zhang, Y., Qin, W., Yu, Z., Yu, J., Lin, Y., . . . Wang, Y. (2022). How does overall hospital satisfaction relate to patient experience with nursing care? a cross-sectional study in China. *BMJ Open, 12*(1), e053899.

Chiou, S.-J., Lee, L.-H., Lee, P.-C., & Lin, K.-C. (2019). Better Self-report Health Status and Provider–Patient Communication in Dental Service Can Improve the Patient Experience: A Cross-year Comparison from the NHI Survey. *Health communication*, 1-7.

Christensen, T., Lægreid, P., & Stigen, I. M. (2006). Performance management and public sector reform: The Norwegian hospital reform. *International Public Management Journal, 9*(2), 113-139.

Chumbler, N. R., Otani, K., Desai, S. P., Herrmann, P. A., & Kurz, R. S. (2016). Hospitalized older adults' patient satisfaction: Inpatient care experiences. *Sage Open, 6*(2), 2158244016645639.

Cleary, P. D., Edgman-Levitan, S., McMullen, W., & Delbanco, T. L. (1992). The relationship between reported problems and patient summary evaluations of hospital care. *QRB. Quality review bulletin, 18*(2), 53-59.

Coulter, A., & Cleary, P. D. (2001). Patients' experiences with hospital care in five countries. *Health affairs*, *20*(3), 244-252.

Creswell, J., Plano Clark, V., Gutman, M., & Hanson, W. (2003). In A. Tashakkori & C. Teddlie. *Handbook of mixed methods in social & behavioral research*, 209-240.

Creswell, J. W., & Clark, V. L. P. (2017). *Designing and conducting mixed methods research*: Sage publications.

Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests. *Psychometrika, 16*(3), 297-334.

Crow, H., Gage, H., Hampson, S., Hart, J., Kimber, A., Storey, L., & Thomas, H. (2002). Measurement of satisfaction with health care: Implications for practice from a systematic review of the literature. *Health technology assessment*.

Démuth, A. (2013). Perception theories. *Kraków: Trnavská univerzita, 2549*.

DeVellis, R. F. (1991). Guidelines in scale development. *Scale Development: Theory and Applications. Newbury Park, Calif: Sage, 5191*.

DeVellis, R. F. (2016). *Scale development: Theory and applications* (Vol. 26): Sage publications.

DiLeo, R., Borkowski, N., O'Connor, S. J., Datti, P., & Weech-Maldonado, R. (2020). The Relationship Between "Leader in

LGBT Healthcare Equality" Designation and Hospitals' Patient Experience Scores. *Journal of Healthcare Management, 65*(5), 366-377.

Dobrzykowski, D. D., Callaway, S. K., & Vonderembse, M. A. (2015). Examining pathways from innovation orientation to patient satisfaction: A relational view of healthcare delivery. *Decision Sciences, 46*(5), 863-899.

Donabedian, A. (1980). *The Definition of Quality and Approaches to Its Assessment. Explorations in Quality Assessment and Monitoring.* (Vol. 1). Ann Arbor, Michigan, USA.: Health Administration Press.

Doyle, C., Lennox, L., & Bell, D. (2013). A systematic review of evidence on the links between patient experience and clinical safety and effectiveness. *BMJ Open, 3*(1), e001570.

Dunn, A. S., Reyna, M., Radbill, B., Parides, M., Colgan, C., Osio, T., . . . Zwerling, M. (2017). The impact of bedside interdisciplinary rounds on length of stay and complications. *Journal of Hospital Medicine, 12*(3), 137-142.

Eng, C.-J., & Pai, H.-C. (2015). Determinants of nursing competence of nursing students in Taiwan: The role of self-reflection and insight. *Nurse Education Today, 35*(3), 450-455.

Epping-Jordan, J., Pruitt, S., Bengoa, R., & Wagner, E. H. (2004). Improving the quality of health care for chronic conditions. *BMJ quality & safety, 13*(4), 299-305.

Eysenck, M. W., & Keane, M. T. (2008). *Kognitivní psychologie*: Academia Praha.

Ferrando, P., Gould, D. W., Walmsley, E., Richards-Belle, A., Canter, R., Saunders, S., . . . Hinton, L. (2019). Family satisfaction with critical care in the UK: a multicentre cohort study. *BMJ Open, 9*(8), e028956.

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of marketing research, 18*(1), 39-50.

Garratt, A., Bjærtnes, Ø. A., Krogstad, U., & Gulbrandsen, P. (2005). The OutPatient Experiences Questionnaire (OPEQ): data quality, reliability, and validity in patients attending 52 Norwegian hospitals. *BMJ quality & safety, 14*(6), 433-437.

Garratt, A., Danielsen, K., Bjertnaes, Ø., & Ruud, T. (2006). PIPEQ--a method for measurement of user satisfaction in mental health services. *Tidsskrift for den Norske laegeforening: tidsskrift for praktisk medicin, ny raekke, 126*(11), 1478-1480.

Garratt, A. M., Bjærtnes, Ø. A., Krogstad, U., & Gulbrandsen, P. (2005). The OutPatient Experiences Questionnaire (OPEQ): data quality, reliability, and validity in patients attending 52 Norwegian hospitals. (2044-5415).

Garratt, A. M., Bjertnæs, Ø. A., & Barlinn, J. (2007). Parent experiences of paediatric care (PEPC) questionnaire: reliability and validity following a national survey. *Acta Paediatrica, 96*(2), 246-252. Retrieved from https://onlinelibrary.wiley.com/doi/full/10.1111/j.1651-2227.2007.00049.x

Gibson, J. (1979). The ecological approach to visual perception Boston: Houghton Mifling, c1979.

Gibson, J. J. (1950). *The perception of the visual world*. Boston: Houghton Mifflin.

Gregory, R. L. (1968). The evolution of eyes and brains-a hen-and-egg problem. In S. J. Freedman (Ed.), *The Neuropsychology of Spatially Orientated Behaviour* (pp. 7-17). Illinois.

Gregory, R. L. (1990). *Eye and brain: The psychology of seeing*. Oxford: Oxford University Press.

Griffith, K. N., Li, D., Davies, M. L., Pizer, S. D., & Prentice, J. C. (2019). Call center performance affects patient perceptions of access and satisfaction. *The American journal of managed care, 25*(9), e282-e287.

Hair, J., Sarstedt, M., Hopkins, L., & Kuppelwieser, V. G. (2014). Partial least squares structural equation modeling (PLS-SEM). *European business review*.

Halliday, M. A. (2005). On matter and meaning: the two realms of human experience. *Linguistics & the Human Sciences, 1*(1).

Haugum, M., Danielsen, K., Iversen, H. H., & Bjertnaes, O. (2014). The use of data from national and other large-scale user experience surveys in local quality work: a systematic review. *International Journal for Quality in Health Care, 26*(6), 592-605.

Helsedirektoratet. (2022). National Quality Indicators (Publication no. https://www.helsedirektoratet.no/statistikk/kvalitetsindikatorer).

Retrieved 05 July 2022 https://www.helsedirektoratet.no/statistikk/kvalitetsindikatorer

Hu, L., Ding, H., Liu, S., Wang, Z., Hu, G., & Liu, Y. (2020). Influence of patient and hospital characteristics on inpatient satisfaction in China's tertiary hospitals: A cross-sectional study. *Health Expectations, 23*(1), 115-124.

Hundert, E. M. (1990). *Philosophy, psychiatry and neuroscience: three approaches to the mind: a synthetic analysis of the varieties of human experience*: Oxford University Press.

Iversen, H. H., Bjertnæs, Ø. A., Groven, G., & Bukholm, G. (2010). Usefulness of a national parent experience survey in quality improvement: views of paediatric department employees. *Qual Saf Health Care, 19*(5), e38-e38. Retrieved from https://qualitysafety.bmj.com/content/qhc/19/5/e38.full.pdf

Iversen, H. H., Holmboe, O., & Bjertnæs, Ø. A. (2012). The Cancer Patient Experiences Questionnaire (CPEQ): reliability and construct validity following a national survey to assess hospital cancer care from the patient perspective. *BMJ Open, 2*(5), e001437. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3488707/pdf/bmjopen-2012-001437.pdf

Johannessen, K. A., Kittelsen, S. A., & Hagen, T. P. (2017). Assessing physician productivity following Norwegian hospital reform: A panel and data envelopment analysis. *Social Science and Medicine, 175*, 117-126.

Johnston, B. C., Patrick, D., Devji, T., Maxwell, L., Bingham III, C., Beaton, D., . . . GH, G. (2019). Patient-reported outcomes. In Higgins JPT, Thomas J, Chandler J, Cumpston M, Li T, Page MJ, & W. VA (Eds.), *Cochrane Handbook for Systematic Reviews of Interventions* (2nd ed.). Retrieved from http://ebookcentral.proquest.com/lib/londonschoolecons/detail.action?docID=5906330

Jones, R., & Jenkins, F. (2007). Key Topics in Healthcare Management: Understanding the Big

Picture. In *Key Topics in Healthcare Management: Understanding the Big Picture* (pp. 164-179). Oxford: Radcliffe Publishing.

Joober, H., Chouinard, M.-C., King, J., Lambert, M., Hudon, É., & Hudon, C. (2018). The patient experience of integrated care scale: a validation study among patients with chronic conditions seen in primary care. *International journal of integrated care, 18*(4).

Kennedy, G. D., Tevis, S. E., & Kent, K. C. (2014). Is there a relationship between patient satisfaction and favorable outcomes? *Annals of Surgery, 260*(4), 592.

Konsmo, T., de Vibe, M., Bakke, T., Udness, E., Eggesvik, S., Norheim, G., . . . Vege, A. (2015). Model for quality improvement-development and use in practical improvement work. Retrieved from https://www.fhi.no/publ/2015/modell-for-kvalitetsforbedring--utvikling-og-bruk-av-modellen-i-praktisk-fo/

Kutney-Lee, A., McHugh, M. D., Sloane, D. M., Cimiotti, J. P., Flynn, L., Neff, D. F., & Aiken, L. H. (2009). Nursing: A Key To Patient Satisfaction: Patients' reports of satisfaction are higher in hospitals where nurses practice in better work environments or with more favorable patient-to-nurse ratios. *Health affairs, 28*(Suppl3), w669-w677.

Lægreid, P., Opedal, S. l., & Stigen, I. M. (2005). The Norwegian hospital reform: Balancing political control and enterprise autonomy. *Journal of Health Politics, Policy and Law, 30*(6), 1027-1064.

Lawson, E. F., & Yazdany, J. (2012). Healthcare quality in systemic lupus erythematosus: using Donabedian’s conceptual framework to understand what we know. *International journal of clinical rheumatology, 7*(1), 95.

Litwin, G. H., & Stringer, R. A. (1968). Motivation and organizational climate.

Lohr, K. N. (1990). Defining quality of care. In *Medicare: a strategy for quality assurance: VOLUME II sources and methods*: National Academies Press (US).

Loiselle, C. G., Howell, D., Nicoll, I., & Fitch, M. (2019). Toward the development of a comprehensive cancer experience measurement framework. *Supportive Care in Cancer*, 1-11.

MacDavitt, K., Chou, S.-S., & Stone, P. W. (2007). Organizational climate and health care outcomes. *The Joint Commission Journal on Quality and Patient Safety, 33*(11), 45-56.

Madhukar, V., & Sharma, S. (2017). Organisational climate: A conceptual perspective. *Article in International Journal of Management and Business, 1*.

Manary, M. P., Boulding, W., Staelin, R., & Glickman, S. W. (2013). The patient experience and health outcomes. *New England Journal of Medicine, 368*(3), 201-203.

Moher, D., Shamseer, L., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., . . . Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015 statement. *Systematic reviews, 4*(1), 1-9.

Monash, B., Najafi, N., Mourad, M., Rajkomar, A., Ranji, S. R., Fang, M. C., . . . Shen, A. (2017). Standardized attending rounds to improve the patient experience: a pragmatic cluster randomized controlled trial. *Journal of Hospital Medicine, 12*(3), 143-149.

Murray, C. J., & Frenk, J. (2000). A framework for assessing the performance of health systems. *Bulletin of the world Health Organization, 78*, 717-731.

Musah, M. B., Ali, H. M., al-Hudawi, S. H. V., Tahir, L. M., Daud, K. B., Said, H. B., & Kamil, N. M. (2016). Organisational climate as a predictor of workforce performance in the Malaysian higher education institutions. *Quality Assurance in Education*.

Muthén, L. K., & Muthén, B. O. (1998-2022a). *Mplus User's Guide, Eighth edition.* Los Angeles, CA: Muthén & Muthén.

Muthén, L. K., & Muthén, B. O. (1998-2022b). Mplus Version 8.8. Base Program and Combination Add-On (64-bit).

Needham, B. R. (2012). The Truth About Patient Experience: What We Can Learn from Other Industries, and How Three Ps Can Improve Health Outcomes, Strengthen Brands, and Delight Customers. *Journal of Healthcare Management, 57*(4), 255-263. Retrieved from https://www.proquest.com/scholarly-journals/truth-about-patient-experience-what-we-can-learn/docview/1032976828/se-2?accountid=9630http://pmt-eu.hosted.exlibrisgroup.com/openurl/44LSE/44LSE_services_page?url_ver=Z39.88-2004&rft_val_fmt=info:ofi/fmt:kev:mtx:journal&genre=article

&sid=ProQ:ProQ%3Apq1busgeneral&atitle=The+Truth+About+Patient+Experience%3A+What+We+Can+Learn+from+Other+Industries%2C+and+How+Three+Ps+Can+Improve+Health+Outcomes%2C+Strengthen+Brands%2C+and+Delight+Customers&title=Journal+of+Healthcare+Management&issn=10969012&date=2012-07-01&volume=57&issue=4&spage=255&au=Needham%2C+Brian+R&isbn=&jtitle=Journal+of+Healthcare+Management&btitle=&rft_id=info:eric/22905604&rft_id=info:doi/

Nemati, R., Bahreini, M., Pouladi, S., Mirzaei, K., & Mehboodi, F. (2020). Hospital service quality based on HEALTHQUAL model and trusting nurses at Iranian university and non-university hospitals: a comparative study. *BMC Nursing, 19*(1), 1-9.

Nembhard, I. M., Northrup, V., Shaller, D., & Cleary, P. D. (2012). Improving organizational climate for quality and quality of care: does membership in a collaborative help? *Medical Care, 50*(Suppl), S74.

Nembhard, I. M., Yuan, C. T., Shabanova, V., & Cleary, P. D. (2015). The relationship between voice climate and patients' experience of timely care in primary care clinics. *Health care management review, 40*(2), 104.

Netemeyer, R. G., Bearden, W. O., & Sharma, S. (2003). *Scaling procedures: Issues and applications*: Sage Publications.

NIH. (2021). The National Institutes of Health (NIH) quality assessment tool for observational cohort and cross-sectional studies. Retrieved from https://www.nhlbi.nih.gov/health-topics/study-quality-assessment-tools

Nunnally, J. C., & Bernstein, I. H. (1994). Psychological theory. In: New York: McGraw-Hill.

Oben, P. (2020). Understanding the Patient Experience: A Conceptual Framework. *Journal of Patient Experience, 7*(6), 906-910. doi:10.1177/2374373520951672

Olsen, E. (2009). Safety climate and safety culture in health care and the petroleum industry: psychometric quality, longitudinal change, and structural models.

Oltedal, S., Garratt, A., Bjertnæs, Ø., Bjørnsdottìr, M., Freil, M., & Sachs, M. (2007). The NORPEQ patient experiences questionnaire: data quality, internal consistency and validity following a Norwegian inpatient survey. *Scandinavian Journal of Public Health, 35*(5), 540-547.

Pettersen, K. I., Veenstra, M., Guldvog, B., & Kolstad, A. (2004). The Patient Experiences Questionnaire: development, validity and reliability. *International Journal for Quality in Health Care, 16*(6), 453-463.

Pitter, J. G., Csanádi, M., Szigeti, A., Lukács, G., Kovács, Á., Moizs, M., . . . Kraus, M. (2019). Planning, implementation and operation of a personalized patient management system for subjects with first suspect of cancer (OnkoNetwork): system description based on a qualitative study. *BMC health services research, 19*(1), 131.

Pollio, H. R., Henley, T. B., & Thompson, C. J. (1997). *The phenomenology of everyday life: Empirical investigations of human experience*: Cambridge University Press.

Pope, K. (2013). *The stream of consciousness: Scientific investigations into the flow of human experience*: Springer Science & Business Media.

Pope, K. S., & Singer, J. L. (1978). Introduction: The flow of human experience. In *The stream of consciousness: Scientific investigations into the flow of human experience* (pp. 1-6): Springer.

Putnick, D. L., & Bornstein, M. H. (2016). Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Developmental review, 41*, 71-90.

Real, K., Bell, S., Williams, M. V., Latham, B., Talari, P., & Li, J. (2020). Patient perceptions and real-time observations of bedside rounding team communication: The interprofessional teamwork innovation model (ITIM). *The Joint Commission Journal on Quality and Patient Safety, 46*(7), 400-409.

Reichers, A. E., & Schneider, B. (1990). Climate and culture: An evolution of constructs. *Organizational climate and culture, 1*, 5-39.

Sacks, G. D., Lawson, E. H., Dawes, A. J., Russell, M. M., Maggard-Gibbons, M., Zingmond, D. S., & Ko, C. Y. (2015). Relationship between hospital performance on a patient satisfaction survey and surgical quality. *JAMA surgery, 150*(9), 858-864.

Schneider, B. (1975). Organizational climates: An essay 1. *Personnel psychology, 28*(4), 447-479.

Schneider, B., & Bowen, D. E. (1985). Employee and customer perceptions of service in banks: Replication and extension. *Journal of applied Psychology, 70*(3), 423.

Schreiber, J. B., Nora, A., Stage, F. K., Barlow, E. A., & King, J. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of educational research, 99*(6), 323-338.

Shale, S. (2013). Patient experience as an indicator of clinical quality in emergency care. *Clinical Governance: An International Journal, 18*(4), 285-292.

Shamseer, L., Moher, D., Clarke, M., Ghersi, D., Liberati, A., Petticrew, M., . . . Stewart, L. A. (2015). Preferred reporting items for systematic review and meta-analysis protocols (PRISMA-P) 2015: elaboration and explanation. *BMJ, 349.*

Singer, S. J., Burgers, J., Friedberg, M., Rosenthal, M. B., Leape, L., & Schneider, E. (2011). Defining and measuring integrated patient care: promoting the next frontier in health care delivery. *Medical Care Research and Review, 68*(1), 112-127.

Sitzia, J. (1999). How valid and reliable are patient satisfaction data? An analysis of 195 studies. *International Journal for Quality in Health Care, 11*(4), 319-328.

Sjetne, I. S., Bjertnaes, O. A., Olsen, R. V., Iversen, H. H., & Bukholm, G. (2011). The Generic Short Patient Experiences Questionnaire (GS-PEQ): identification of core items from a survey in Norway. *BMC health services research, 11*(1), 88.

Sjetne, I. S., Veenstra, M., & Stavem, K. (2007). The effect of hospital size and teaching status on patient experiences with hospital care: a multilevel analysis. *Medical Care*, 252-258.

Snyder, C. F., Jensen, R. E., Segal, J. B., & Wu, A. W. (2013). Patient-reported Outcomes (PROs): Putting the Patient Perspective in Patient-centered Outcomes Research. *Medical Care, 51*, S73-S79. Retrieved from http://www.jstor.org.gate3.library.lse.ac.uk/stable/42568869

Snyder, H. J., & Fletcher, K. E. (2020). The Hospital Experience Through the Patients' Eyes. *Journal of Patient Experience, 7*(3), 408-417. doi:10.1177/2374373519843056

Strange, J. R. (1978). A Search for the Sources of the Stream of Consciousness. In *The stream of consciousness: Scientific Investigations into the flow of human experience* (pp. 9-29): Springer.

Thomas, J., Graziosi, S., Brunton, J., Ghouze, Z., O'Driscoll, P., & Bond, M. K. A. (Producer). (2022). EPPI-Reviewer: advanced software for systematic reviews, maps and evidence synthesis.

Vandenberg, R. J., & Lance, C. E. (2000). A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organizational research methods*, *3*(1), 4-70.

Wagland, R., Recio-Saucedo, A., Simon, M., Bracher, M., Hunt, K., Foster, C., . . . Corner, J. (2016). Development and testing of a text-mining approach to analyse patients' comments on their experiences of colorectal cancer care. *BMJ Qual Saf, 25*(8), 604-614.

Wangensteen, S., Johansson, I. S., & Nordström, G. (2015). Nurse competence scale–Psychometric testing in a Norwegian context. *Nurse education in practice, 15*(1), 22-29.

Weldring, T., & Smith, S. M. S. (2013). Article Commentary: Patient-Reported Outcomes (PROs) and Patient-Reported Outcome Measures (PROMs). *Health Services Insights, 6*, HSI.S11093. doi:10.4137/hsi.S11093

WHO. (2006a). *Everybody's business: Strengthening health systems to improve health outcomes: WHO's framework for action.* Retrieved from Geneva, Switzerland:

WHO. (2018). *Handbook for national quality policy and strategy: a practical approach for developing policy and strategy to improve quality of care.* Retrieved from Geneva, Switzerland:

Wolf, C., & Jason, A. (2014). Defining patient experience. *Patient experience journal*, *1*(1), 7-19.

Wray, C. M., Flores, A., Padula, W. V., Prochaska, M. T., Meltzer, D. O., & Arora, V. M. (2016). Measuring patient experiences on hospitalist and teaching services: Patient responses to a 30-day postdischarge questionnaire. *Journal of Hospital Medicine, 11*(2), 99-104.

Yu, C. H. (2009). Book review: Creswell, J., & Plano Clark, V.(2007). Designing and conducting mixed methods research. Thousand oaks, CA: sage. *Organizational research methods*, *12*(4), 801-804.

Zohar, D. (1980). Safety climate in industrial organizations: theoretical and applied implications. *Journal of applied psychology*, *65*(1), 96.

PAPER 1

Towards a quality care climate perspective: a review of associations among patient experiences, patient outcomes and organisational climate in hospitals.

Seth Ayisi Addo, Reidar Johan Mykletun, Espen Olsen

This paper is not included in the repository because it is still in review.

PAPER 2

Validation and Adjustment of the Patient Experience Questionnaire (PEQ): A Regional Hospital Study in Norway

Seth Ayisi Addo, Reidar Johan Mykletun, Espen Olsen

Status: Published in International Journal of Environmental Research and Public Health (IJERPH)

International Journal of
Environmental Research and Public Health

Article

Validation and Adjustment of the Patient Experience Questionnaire (PEQ): A Regional Hospital Study in Norway

Seth Ayisi Addo *, Reidar Johan Mykletun and Espen Olsen

Department of Innovation, Leadership and Marketing, University of Stavanger Business School,
University of Stavanger, 4036 Stavanger, Norway; reidar.j.mykletun@uis.no (R.J.M.); espen.olsen@uis.no (E.O.)
* Correspondence: seth.a.addo@uis.no

Abstract: This paper assesses the psychometric qualities of the Patient Experience Questionnaire (PEQ), thereby validating a patient-oriented measurement model in a hospital environment, and modifies the model based on empirical results. This study employed survey data gathered by the Norwegian Institute of Public Health from adult inpatients at somatic hospitals in the Health South-East RHF in Norway. The survey engaged 4603 patients out of 8381 from five main hospitals in the region. The study found that an eight-factor model of the PEQ generally showed good fitness to the data, but assessment of discriminant validity showed that this was not the optimal factor solution among four of the eight dimensions. After comparing models, the study proposed a model with a second-order factor for four of the factors: "nurse services", "doctor services", "information", and "organization", collectively named "treatment services". The proposed model demonstrated good validity and reliability results. The results present theoretical and practical implications. The study recommends that inferential analyses on the PEQ should be done with the second-order factor. Furthermore, a revision of the PEQ is recommended subject to more confirmatory studies with larger samples in different regions. The study indicates a second-order factor structure for assessing and understanding patient experiences—a finding which has both theoretical and managerial implications.

Keywords: patient experiences; PREMs; psychometrics; CFA; hospital; second-order factor; Norway

Citation: Addo, S.A.; Mykletun, R.J.; Olsen, E. Validation and Adjustment of the Patient Experience Questionnaire (PEQ): A Regional Hospital Study in Norway. *Int. J. Environ. Res. Public Health* **2021**, *18*, 7141. https://doi.org/10.3390/ijerph18137141

Academic Editors: Andrea Glässel and Christine Holmberg

Received: 20 May 2021
Accepted: 30 June 2021
Published: 3 July 2021

1. Introduction

Healthcare professionals are facing heavy pressure to meet the growing needs of patients such as medical, physical, and psychological healthcare needs [1] as well as patients' expectations of quality services, products, and performance [2]. This is due to the increasing and alarming rate of morbidity and multi-morbidity in Western countries [3], together with aging populations and the healthcare needs of the aged. Pressure on healthcare professionals has increased in recent times with the outbreak of global pandemics such as COVID-19. Notwithstanding these morbidity rates and the growing needs of patients, healthcare providers and professionals are expected to ensure positive patient experiences. This study, focusing on hospitals and their professionals, seeks to examine patients' experiences with hospital service climates, focusing on the psychometric quality of a patient-reported experience measure (PREM).

The endeavour of gathering patients' experiences with healthcare has gained popularity, thus resulting in the development of PREMs that have been used in surveys in various countries [4–8]. In a bid to clarify the meaning of patient experiences, Wolf and Jason [9] synthesized various definitions of the concept and maintained that patient experiences comprise individual as well as collective events and occurrences that happen in the process of caregiving, and this has strong links with patients' expectations and how they were met. Wagland et al. [10] noted that significant progress has been made in understanding patient experience. The concept is viewed as interactions of patients with aspects of the healthcare delivery such as nurse services, doctor services, organization of the caregiving process in hospitals, and information delivery, where these aspects (dimensions) culminate in the entire continuum of experience that patients have with healthcare, as reported by the patients.

From patients' perspectives, interactions with dimensions of healthcare have been theoretically underpinned by the Donabedian framework for assessing healthcare quality [11], which is considered the most widely used in the healthcare sector to assess quality [12]. According to this framework, quality of healthcare can be assessed by making inferences under three categories: structure, process, and outcome. The structure deals with the setting in which care is given, for instance, facilities, equipment, and human resources. The process deals with what is done in giving and receiving care, for instance, nurse and doctor services as well as good communication and information sharing between patients and hospitals; and lastly, the outcome deals with the effects of care on health and well-being [11,13].

Increased understanding of patient experiences of hospital climate has similarly been aided by increased research and several studies on measuring the construct. Measurements in social science provide adequate guidelines for assessing phenomena and people's attributes that are not directly and easily observable [14]. Employing poor and inadequate measures in research can be very costly to practice, in terms of drawing invalid conclusions, making policy decisions based on false information, and wasting respondents' time and efforts [15]. DeVellis [15], however, indicated that a major challenge to developing adequate measures in social science is the immaterial nature of social science constructs supported by constantly changing theories. This makes measurements in social science susceptible to constant changes in performance and adequacy in assessing the constructs. Consequently, social science measures need to be constantly reviewed and reassessed to keep them abreast with changing theories and constructs and to uphold their validity and reliability. Therefore, reassessing PREMs to ensure adequate psychometric qualities is essential for theoretical and practical advancement of knowledge of patients' experiences, hence the focus and aim of this study.

Justification of the Study

The goal to accurately measure patient experiences has resulted in several PREMs for general and specialized healthcare [5]. The questions and dimensions that these PREMS have produced are indicative of patients' shared experiences. Most of these measures identified similar dimensions of experiences, such as those relating to nurse services, doctor services, information and communication, hospital organization and standards, and discharge from the hospital [5,6,16–18]. Although some of these studies differed with regard to the naming of the dimensions, the content of the items remained very similar among the PREMs. This study is underpinned by two main justifications: (i) psychometric statistical analyses have evolved over the years with more robust tools in validating scales; and (ii) due to the plethora of patient experience measures and unascertained psychometric qualities, existing PREMs should be re-examined to ascertain their validity and reliability, rather than developing new ones. These justifications are elaborated below.

The Norwegian Institute of Public Health (NIPH) conducted a survey in the east health region among a few hospitals, adapting an earlier validated PREM, the Patient Experience Questionnaire (PEQ) [8]. In the development and validation study, Pettersen, Veenstra (8) employed literature reviews, focus groups, pilot studies, and two cross-sectional surveys (1996 and 1998) across 14 hospitals in Norway. The study used exploratory factor analysis, a reliability test (Cronbach's alpha), and a construct validity test. The study found 10 factors and 20 final items out of an initial 35 items: "information on future complaints", "nursing services", "communication", "information examinations", "contact with next-of-kin", "doctor services", "hospital and equipment", "information medication", "organization", and "general satisfaction". All the factors recorded Cronbach's alpha scores between 0.61 and 0.83. Construct validity was also ascertained in the study by examining the relationship between the instrument and demographic factors such as age and gender. Stressing the lack of valid and reliable instruments, Pettersen et al. [8] concluded that it is imperative to re-examine existing patient experience measures so as to improve methodology. They further recommended employment of the PEQ for future in-patient experience surveys, hence the choice for the current study. Although this measure was adapted and modified for use by the NIPH, the performance of the measure should be called into question because this measure was developed and validated more than a decade ago. Psychometric analyses are evolving with more robust validating tools and methods, and this is evident in the study by Pettersen et al. [8] where issues such as discriminant validity and measurement invariance as well as other psychometric issues were absent in the analyses—a gap that the current study tackles.

Beattie et al. [19] also noted the problem of multiple patient experience measures with unascertained psychometric quality. This problem has hindered the use of data from patient experience surveys to adequately improve and sustain quality of care in hospitals. In the systematic review, Beattie et al. [19] developed a matrix to help choose PREMs for research and to identify research gaps in existing ones. This matrix showed that the PEQ study by Pettersen et al. [8] lacked analyses such as criterion-related validity. On this basis, the current study asserts that rather than developing more PREMs (which seem already saturated), existing ones should be re-examined, as recommended earlier by Pettersen et al. [8], in light of current analyses and conceptual underpinnings. This need for re-examination has also been recommended by other systematic reviews on patient experience [20,21].

Additionally, some PREMs have been developed in Norway to capture the phenomenon of patient experiences with general health practice as well as experiences with specific health issues and fields, with most of them asking questions on general patient satisfaction [8,18,22,23]. Haugum et al. [20] similarly recommended the need to repeat patient experience surveys and their outcomes in order to generate more validated instruments, as they are potentially affected by contextual factors. By inference, it can be said that the underlying psychometric rigors of a PREM can dwindle as they are employed over a long period. Although several surveys exist on patient experiences on various issues [2,24–27], a re-analysis of the psychometric performance of any particular measure is lacking. The quest to improve healthcare delivery and hospital service climate based on patients' experiences should begin with ascertaining the psychometric quality of PREMs. Based on these justifications, the purpose of this article is to test the psychometric qualities of the PEQ, thereby validating a measurement model in a hospital environment.

2. Materials and Methods

2.1. Sample and Data Collection

This study employed anonymous survey data from the Norwegian Institute of Public Health gathered from adult inpatients at somatic hospitals in the Health South-East RHF in Norway. These somatic hospitals dealt with issues generally affecting the bodies of patients and thus, were not specialized. The survey was started by the Norwegian Knowledge Centre for Health Services in the fall of 2015 and was continued at the Norwegian Institute of Public Health in the first quarter of 2016. It is worth noting that the last major reform and restructuring done in the Norwegian health sector was in 2002; where ownership of hospitals was transferred to the state. Thus, although changes have been made over the years since then, they are minor and incremental to the 2002 reform, focusing more on better standardization. These changes may therefore not affect this study in a major way. The survey engaged patients from 5 main hospitals in the region who were admitted for at least a day. The eligibility criteria were patients who were admitted between October and November in 2015 and who were admitted to the hospitals for at least one night. The study excluded outpatients. Patients who visited the 5 hospitals were identified through their contact information after they were discharged. Questionnaires were sent to their respective addresses via post mail with a return envelope. About 8381 patients were eligible and contacted. The total number of respondents who completed and returned their questionnaires was 4603, yielding a response rate of 54.92%. Patients were asked to consider various aspects of their experience being admitted. The questionnaire aimed at using feedback to identify which areas are working well and which areas the hospital should work to improve.

2.2. Instrument

The Patient Experience Questionnaire (PEQ) comprised 8 dimensions and 33 items as well as items on patient safety, patient satisfaction, and overall health benefits and health level. The NIPH adapted the questions for the survey from the PEQ developed and validated by Pettersen et al. [8]: "nurse services" (items N1–N7), "doctor services" (items D1–D7), "information" (items IF1–IF3), "organization" (items OR1–OR4), "next of kin" (items NK1 and NK2), "standard" (items S1–S6), "discharge" (items DC1 and DC2), and "interaction" (items IT1 and IT2). These items were measured on a 5-point Likert scale ranging from "Not at all" (1) to "To a very large extent" (5). Patient safety was measured with 12 items, while patient satisfaction, health benefit, and health level were measured with 1 item each. Background information, such as questions on whether or not the patient chose the hospital they were admitted to, was also included in the questionnaire.

2.3. Data Analysis

2.3.1. Preliminary Analyses

The study analysed the data with the aid of Microsoft Excel (Microsoft, Redmond, WA, USA), SPSS v.24 (IBM Corporation, Armonk, NY, USA), and AMOS v.25 (IBM Corporation, Armonk, NY, USA). Preliminary analysis (such as checking for normality, outliers, and missing value analysis) was conducted in SPSS. The missing values were found to be not at random, and therefore being mindful of how they were replaced was necessary. The study chose to use multiple imputations to replace them as recommended for non-randomness [28,29]. However, the 5 different imputations generated could not be pooled in AMOS as a single imputation for the estimation of the model. Thus, the missing values were eventually replaced with the series mean method. Analysis was performed mainly on the data with missing values due to their non-randomness and also due to the subject matter under investigation being patient experiences; as the study wanted to capture accurate measurements by the respondents. In order to ensure maximum privacy of respondents and still maintain relevant variables for analysis, departments for the analysis were aggregated into medical departments (Med) and surgical departments (Kir) across the hospitals based on the more specific and varied information on units in the hospitals provided by participants. This aggregation was performed according to the departmental codes for health institutions provided by the Norwegian Health Authority.

2.3.2. Measurement Model Development

The initial measurement model (Model 1) was developed in AMOS without modification indices (due to the exclusion of missing values). Missing values were replaced with the series mean method after the estimation of the initial model to obtain modification indices for correlating error terms among the items and improving the fitness of the model (Model 2). It is noteworthy that the missing values were only replaced in order to generate a full estimation with modification indices for correlating the error terms. Although all subsequent models after the initial model were estimated with the correlated error terms, estimations were done on the data with missing values, with the aim of obtaining a more accurate fit of the data to the models.

The initial model with modifications (correlated error terms), Model 2, was compared with 6 other models (Models 3–8), obtained by combining some dimensions into a single factor to further justify the fitness of the modified initial model. These combinations were based on the correlation coefficients between the dimensions. In addition, a proposed model containing a second-order factor for "nurse services", "doctor services", "information", and "organization" was also developed and compared with the initial modified model based on the validity tests, correlation analyses, and theoretical justifications (wording of questions). Fitness of all the models was ascertained using the following indices: Comparative Fit Index (CFI), Tucker Lewis Index (TLI), Root Mean Square Error of Approximation (RMSEA), and the PCLOSE. The thresholds recommended by Hu and Bentler [30] are presented in Table 1.

Table 1. Fitness indices and acceptable thresholds.

Fit Indices	Acceptable Thresholds
CFI	>0.95, excellent; >0.90, acceptable
TLI	>0.95, excellent; >0.90, acceptable
RMSEA	<0.06, excellent; 0.06–0.10, moderate
PCLOSE	>0.05, excellent

Adapted from Hu and Bentler (1999).

2.3.3. Validity and Reliability

Validity in this study was ascertained using convergent, discriminant, and predictive validity tests. Convergent validity deals with the relationship between a latent construct (patient experience dimensions) and its items [31]. The average variance extracted (AVE) was used to check convergent validity, where values must be at least 0.50, indicating that at least half of the variance in the construct (dimension) is explained by its items. Discriminant validity focuses on a construct and its items in relation to other constructs—that is, how different one construct (or dimension) and its items are from other constructs in the model [31]. Discriminant validity was examined using the Fornell–Larcker procedure, where discriminant validity is supported when the square root of the AVEs is greater than the correlation coefficients between the constructs [32]. Predictive validity focuses on the ability of the measure and dimensions to relate to and predict previously ascertained outcomes in literature. This was determined through correlation and regression analyses between patient experiences (and dimensions) and outcome variables (patient satisfaction, health benefits, and health level) with the aid of SPSS. Reliability of the measurement model was also determined using composite reliability values for every dimension of the patient experience measure, with a recommended value of at least 0.70 to ascertain its repeatability in different contexts.

2.4. Ethical Considerations

This study, with regard to data collection, analysis, and compilation, was conducted within the ethical and legal provisions and guidelines of the Norwegian Institute for Public Health (NIPH) and the University of Stavanger. The Norwegian Data Protection Authority and the Norwegian Directorate of Health approved the procedures in the survey. The hospital data protection official assessed the data processing in the hospitals where survey extension took place. Informed consent was obtained from participants in the survey. Respondents were informed that participation was voluntary and they were assured of confidentiality of the information they will provide. Respondents were also informed that they could opt out of the survey at any point as well as the procedure for opting out if they wished. Data was stored in a safe repository with a password, only accessed by the researchers. This study did not present results that revealed patients' identities, thus maintaining anonymity of respondents and confidentiality of responses. All relevant ethical requirements were duly upheld.

3. Results

3.1. Preliminary Analysis and Sample Characteristics

The study made use of responses from 4603 participants. Outliers were recorded for some of the questions, but this was to be expected considering the varied background characteristics, such as age and number of days spent in the hospital, which could influence participants' experiences. Nonetheless, most of these outliers were not deemed extreme based on the 1.5 and 3.0 interquartile ranges. Normality was also ascertained, using the −2 and +2 range [33], for all items of patient experience, except the kurtosis value for one item on "nurse services" and one item on "doctor services". Overall, the data could be said to be normally distributed to a large extent. The sample for the study was taken from five hospitals and characterized by a somewhat fair age distribution of patients across three groups: 60 years and below, between 61 and 73 years, and 74 years and above. Most of the respondents were admitted for three or fewer days, and more of them were also admitted to the medical department aggregate (Med). Table 2 presents the sample characteristics for this study.

Table 2. Sample characteristics.

Variables	Frequency	Valid Percent
Age		
Less than 61 years	1502	32.6
61–73 years	1528	33.2
73 years and above	1573	34.2
Days spent in hospital		
Less than 4 days	2630	57.1
4 or more days	1973	42.9
Department aggregates		
Medical (Med)	2468	53.6
Surgical (Kir)	2135	46.4
Hospitals		
Hospital 1	2067	44.9
Hospital 2	1084	23.5
Hospital 3	193	4.2
Hospital 4	794	17.2
Hospital 5	465	10.1

3.2. Initial Measurement Model Development, Modifications, and Comparisons

The initial CFA model (Model 1, Table 3), with the eight dimensions of patient experience, was then developed to be tested. The model showed acceptable fitness to the data based on fitness indices (CFI = 0.91; TLI = 0.89; RMSEA = 0.06; PCLOSE = 0.00). Nonetheless, there was a need to improve the fitness through modifications in order to reduce measurement errors and to obtain more accurate loadings of the observed items on their dimensions. Some modifications were made by drawing covariance between some error terms on the same dimensions with the rationale that, by virtue of sharing commonalities on the dimension, they are more justified to share similar error terms, thus reducing duplications of random measurement error of items. In total, 19 modifications were made based on the covariance coefficients, with the highest coefficient as 895.667 between S2 and S4 ("standard") and the lowest as 40.390 between D4 and D7 ("doctor services"). Aside from the coefficients, these modifications were theoretically justified. For example, the item D2 was worded, "Did you find that the doctors took care of you?", and D4 was worded as "Did the doctors have time for you when you needed it?" Participants may have given closely related responses due to the phrases "taking care" and "having time when you needed"; therefore, it was no surprise that they shared similar error terms, leading to considerable covariance coefficient. These statistical and theoretical justifications were made for each covariance drawn. The most modifications were made to "doctor services" (seven), followed by "standard" (five), "nurse services" (four), "information" (two), and "organization" (one). No modifications were made to "next of kin", "discharge", or "interaction", owing to very low covariance coefficients (below 20). The initial model with these modifications (Model 2 in Table 3) thus produced excellent fitness values for all indices. Furthermore, the model was compared with six other models (see Section 2), where the initial model with modifications showed the best fitness to the data. The fitness indices of the initial model before and after modifications, as well as those of the six alternative models for comparisons, are presented in Table 3.

Table 3. Fitness results for all models.

Fit Indices	Model 1—Initial Model without Modifications	Model 2 *—Model after Modifications	Models 3–8 *—Alternative Models	Model 9 *—Configural Invariance	Model 10 *—Model after Item Deletion	Model 11 *—Proposed Model
			1st 2nd 3rd 4th 5th 6th			
CFI	0.91	0.95	0.91 0.91 0.92 0.88 0.86 0.85	0.95	0.95	0.96
TLI	0.89	0.94	0.89 0.89 0.90 0.85 0.84 0.82	0.94	0.94	0.95
RMSEA	0.06	0.04	0.06 0.06 0.05 0.07 0.07 0.07	0.03	0.04	0.04
PCLOSE	0.00	1.00	0.00 0.00 0.00 0.00 0.00 0.00	1.00	0.99	0.98

Note: * These models were assessed with the modification estimates. 1st—nurse and doctor into one factor; 2nd—nurse, doctor and organization into one factor; 3rd—nurse and organization into one factor; doctor and information into one factor; 4th—nurse, doctor, organization, and information into one factor; next of kin and standard into one factor; discharge and interaction into one factor; 5th—nurse, doctor, organization, information, next of kin, and standard into one factor; discharge and interaction into one factor; 6th—all dimensions into one factor.

3.3. Measurement Invariance across Hospital Departments Aggregated into Two Groups

Model 2 was further examined for invariance across three categories: configural, metric, and scalar. Measurement invariance tests seek to ascertain whether the measurement model differs across variant groups in a data. The goal is to achieve little or insignificant variance across these groups in order to inspire confidence in the ability of the measure to generate accurate responses and assessments across groups [34]. Configural invariance results (see Model 9, Table 3) showed that the model had acceptable-to-excellent fitness to the data, thus ascertaining configural invariance for the eight-factor patient experience measure across the two hospital department aggregates. With regard to metric invariance, the chi-squared test showed that the fully constrained model and the unconstrained mode were different across the department groups and, thus, not metrically invariant. However, MacKenzie et al. [35] maintained that "full metric invariance is not necessary for further tests of invariance and substantive analyses to be meaningful, provided that at least one item (other than the one fixed at unity to define the scale of each latent construct) is metrically invariant" (p. 325). Thus, the critical ratios test was performed to examine whether the dimensions and the items were metrically invariant enough for further meaningful analyses. The analysis revealed that for all dimensions, with the exception of "next of kin", there was at least one item that was not statistically significant (metrically invariant) besides the item that was constrained for that dimension in the model. This means that the two items on the "next of kin" dimension had significantly different loadings (parameters) across the aggregated departments. Nonetheless, this test showed the model was metrically invariant across the departments to a large extent. The results of this test are presented as a supplementary table (Table S1). Scalar invariance was then examined for the model based on the differences in the measurement intercepts. The analyses showed that the model did not have scalar invariance. Differences in intercept estimates of items between the departments were computed, showing that almost all the items did not have scalar invariance across the two departments. The results are presented as a supplementary table (Table S2).

3.4. Reliability

Reliability for the measure was ascertained using composite reliability (CR) values. Generally, CR values above 0.70 are deemed acceptable to justify reliability. From Table 4, it is seen that all the dimensions recorded CR values above 0.70, with the highest being "doctor services" (0.92) and the lowest being "interaction" (0.72).

Table 4. Correlations, reliability, convergent, and discriminant validity before item deletion (Model 2).

	CR	**AVE**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**
1. Nurse services	0.90	0.57	**0.76**							
2. Doctor services	0.92	0.64	0.80	**0.80**						
3. Information	0.87	0.70	0.77	0.82	**0.83**					
4. Organization	0.81	0.53	0.85	0.80	0.79	**0.73**				
5. Next of kin	0.83	0.70	0.69	0.59	0.63	0.71	**0.84**			
6. Standard	0.82	0.44	0.65	0.57	0.56	0.73	0.60	**0.67**		
7. Discharge	0.87	0.77	0.57	0.56	0.63	0.58	0.49	0.44	**0.88**	
8. Interaction	0.72	0.57	0.57	0.58	0.56	0.63	0.53	0.50	0.56	**0.75**

Note: CR—composite reliability; AVE—average variance explained; figures in bold are the square roots of the AVEs for discriminant validity (using the Fornell–Larcker procedure; discriminant validity is supported when the square root of the AVEs are greater than the correlation coefficients between the constructs).

3.5. Convergent and Discriminant Validity

Convergent validity was examined using the AVE values, where an AVE value of at least 0.50 is considered acceptable [31]. Table 4 shows that all dimensions, with the exception of "standard", recorded values above 0.50, thus ascertaining convergent validity. Discriminant validity was ascertained using the Fornell–Larcker procedure. There, discriminant validity is supported when the square root of the AVEs is greater than the correlation coefficients between the constructs [32]. From Table 4, it is seen that discriminant validity issues were observed for "doctor services" (in relation to "information"); "organization" (in relation to "doctor services", "nurse services", and "information"); and "standard" (in relation to "organization"). This means that these three dimensions were not distinct from the others enough for each to measure the different sub-concepts under patient experience.

3.6. Construct Validity, Item Loadings, and Deletion

Construct validity for the items was examined by checking item loadings (parameter estimates) on their dimensions. Generally, good loadings were recorded as a majority of the items had loadings above 0.60. The item loadings ranged from 0.88 (on "discharge") to 0.55 (on "standard"). Two items had loadings below 0.60: 0.58 (ORG 2) and 0.55 (ST 5). Based on the suggestion of the master validity tool [36], these items together with a third (ST4) were deleted in a bid to boost the validity of the measure. Item loadings before and after deletion are presented in Table 5. After deletion, the dimension "standard" recorded an increase in AVE value, indicating that the remaining four items explained more variance in the dimension than the original six items, seen in Table 6. Figure 1 presents the model after item deletion as well as validity and reliability checks. See Model 10 in Table 3 for the fit indices of this model.

Table 5. Standardized factor loadings (before and after item deletion) and missing values.

Dimensions and Items	Factor Loadings			
	Model 2	**Model 10**	**Model 11**	**Missing Values *N* (%)**
Nurse services				
N1. Did the nursing staff talk to you so you understood them?	0.67	0.66	0.67	287 (6.2)
N2. Did you find that the nursing staff cared for you?	0.80	0.80	0.79	293 (6.4)
N3. Do you have confidence in the professional skills of the nursing staff?	0.78	0.78	0.78	282 (6.2)
N4. Did you tell the nursing staff everything you thought was important about your condition?	0.72	0.72	0.72	340 (7.4)
N5. Did you find that the nursing staff were interested in your description of your own situation?	0.83	0.83	0.83	328 (7.1)
N6. Were you included in the advice on questions regarding your care?	0.70	0.70	0.68	427 (9.3)
N7. Did the nursing staff have time for you when you needed it?	0.77	0.77	0.78	297 (6.5)
Doctor services				
D1. Did the doctors talk to you so you understood them?	0.73	0.73	0.73	300 (6.5)
D2. Did you find that the doctors took care of you?	0.84	0.84	0.83	302 (6.6)
D3. Do you trust the doctors′ professional skills?	0.77	0.77	0.77	299 (6.5)
D4. Did the doctors have time for you when you needed it?	0.82	0.82	0.82	415 (9.0)
D5. Did you tell the doctors everything you thought was important about your condition?	0.77	0.77	0.77	384 (8.3)
D6. Did you find that the doctors were interested in your description of your own situation?	0.84	0.84	0.85	378 (8.2)
D7. Did you find that the treatment was adapted to your situation?	0.79	0.79	0.76	321 (7.0)
Information				
IF1. Did you know what you thought was necessary about how tests and examinations should take place?	0.79	0.79	0.85	320 (7.0)
IF2. Did you know what you thought was necessary about the results of tests and examinations?	0.85	0.85	0.86	334 (7.3)
IF3. Did you receive sufficient information about your diagnosis or your complaints?	0.86	0.86	0.87	326 (7.1)
Organization				
OR1. Did you find that there was a permanent group of nursing staff that took care of you?	0.67	0.67	0.68	121 (2.6)
* OR2. Did you find that one doctor had the main responsibility for you?	0.58	-	-	130 (2.8)
OR3. Did you find that the hospital′s work was well organized?	0.81	0.82	0.82	107 (2.3)
OR4. Did you find that important information about you had come to the right person?	0.82	0.81	0.81	204 (4.4)

Table 5. *Cont.*

Dimensions and Items	Factor Loadings			
	Model 2	**Model 10**	**Model 11**	**Missing Values *N* (%)**
Next of kin				
NK1. Were your relatives well received by the hospital staff?	0.84	0.84	0.84	1362 (29.6)
NK2. Was it easy for your relatives to get information about you while you were in the hospital?	0.83	0.83	0.83	1732 (37.6)
Standard				
S1. Did you get the impression that the hospital equipment was in good condition?	0.71	0.72	0.78	108 (2.3)
S2. Did you get the impression that the hospital was in good condition?	0.77	0.78	0.86	122 (2.7)
S3. Was the room you were in satisfactory?	0.67	0.65	0.74	80 (1.7)
* S4. Was the opportunity for rest and rest satisfactory?	0.62	-	0.66	90 (2.0)
* S5. Was the food satisfactory?	0.55	-	-	122 (2.7)
S6. Was the cleaning satisfactory?	0.65	0.66	0.60	89 (1.9)
Discharge				
DC.1 Were you informed of what you could do at home in case of relapse?	0.87	0.87	-	1327 (28.8)
DC2. Were you informed of what complaints you could expect to receive in time after your hospital stay?	0.88	0.88	-	1195 (26.0)
Interaction				
IT1. Do you find that the hospital has worked well with your GP about what you were admitted to?	0.82	0.81	-	2523 (33.9)
IT2. Do you feel that the hospital has cooperated well with the home or other municipal services about what you were admitted for?	0.69	0.69	-	3401 (54.8)
Treatment services				
Nurse services			0.92	
Doctor services			0.86	
Information			0.84	
Organization			0.93	

Note: Items marked with * had the lowest loadings.

Table 6. Correlations, reliability, convergent, and discriminant validity after item deletion (Model 10).

	CR	AVE	1	2	3	4	5	6	7	8
1. Nurse services	0.90	0.57	**0.76**							
2. Doctor services	0.92	0.64	0.80	**0.80**						
3. Information	0.87	0.70	0.77	0.82	**0.83**					
4. Organization	0.81	0.59	0.87	0.78	0.79	**0.77**				
5. Next of kin	0.82	0.70	0.69	0.59	0.63	0.72	**0.84**			
6. Standard	0.80	0.50	0.64	0.56	0.55	0.74	0.59	**0.70**		
7. Discharge	0.87	0.77	0.57	0.56	0.63	0.56	0.49	0.44	**0.88**	
8. Interaction	0.72	0.57	0.57	0.58	0.56	0.62	0.53	0.47	0.56	**0.75**

Note: CR—composite reliability; AVE—average variance explained; figures in bold are the square roots of the AVEs for discriminant validity (using the Fornell–Larcker procedure; discriminant validity is supported when the square root of the AVEs are greater than the correlation coefficients between the constructs).

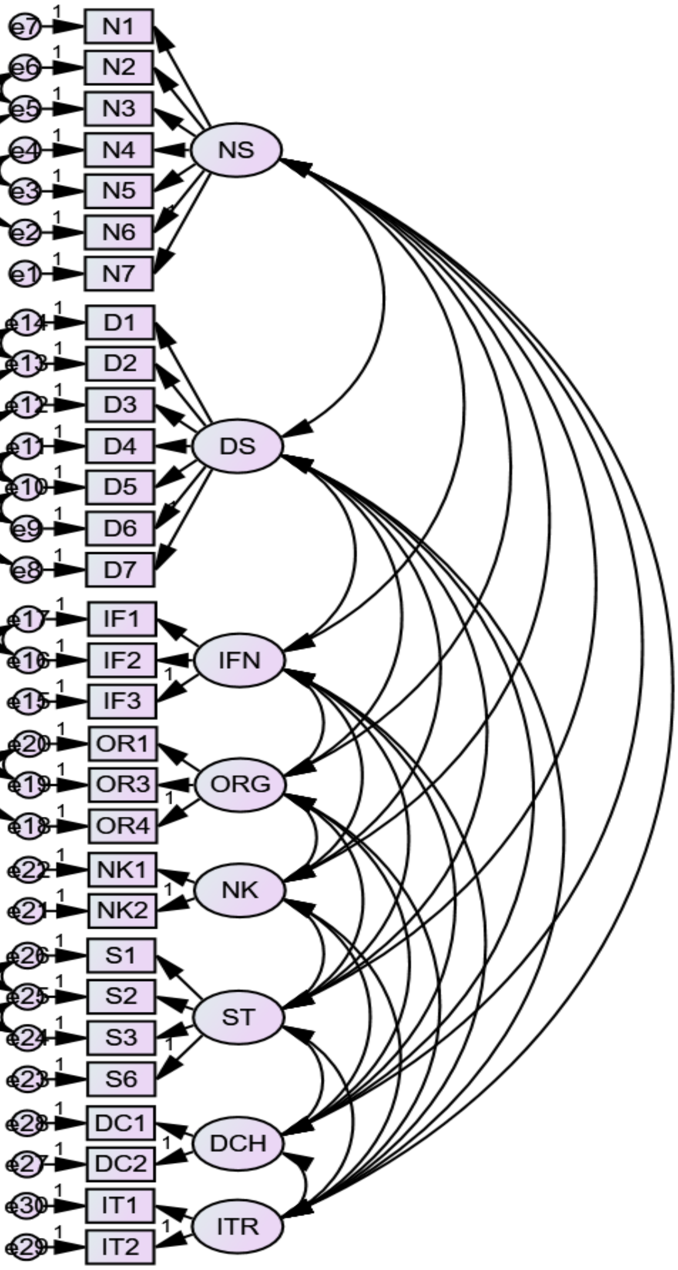


Figure 1. Model after validity checks and item deletion. Note: NS—nurse services; DS—doctor services; INF—information; ORG—organization; ST—standard; NK—next of kin; DCH—discharge; ITR—interaction.

3.7. Criterion-Related Validity

The study then assessed the predictive validity of the model based on its ability to relate to and predict outcome variables ascertained in existing literature. Overall satisfaction, health benefits, and health level were used as outcome variables while the patient experience measure and its dimensions were used as predicting variables. Patient experience measure and dimensions were computed with retained items after item deletion, and multiple linear regression was performed with age and number of days spent in hospital as control variables. The results showed that overall patient experience and each individual dimension related to and predicted at least one outcome variable positively and significantly. These results are presented in Table 7.

Figure 1. Model after validity checks and item deletion. Note: NS—nurse services; DS—doctor services; INF—information; ORG—organization; ST—standard; NK—next of kin; DCH—discharge; ITR—interaction.

3.7. Criterion-Related Validity

The study then assessed the predictive validity of the model based on its ability to relate to and predict outcome variables ascertained in existing literature. Overall satisfaction, health benefits, and health level were used as outcome variables while the patient experience measure and its dimensions were used as predicting variables. Patient experience measure and dimensions were computed with retained items after item deletion, and multiple linear regression was performed with age and number of days spent in hospital as control variables. The results showed that overall patient experience and each individual dimension related to and predicted at least one outcome variable positively and significantly. These results are presented in Table 7.

Table 7. Regression results for criterion-related validity.

Outcome Variables							
	Model 10				**Proposed Model (Model 11)**		
	Satisfaction	**Health Benefits**	**Health Level**		**Satisfaction**	**Health Benefits**	**Health Level**
Predictors				**Predictors**			
Overall patient experience	0.52 ***	0.47 ***	0.19 ***	Treatment services	0.57 ***	0.50 ***	0.28 ***
Nurse services	0.35 ***	0.18 ***	0.10 ***	Standard	0.20 ***	0.10 ***	0.00
Doctor services	0.07 ***	0.12 ***	0.10 ***	Next of kin	0.02	0.01	−0.07 ***
Information		0.09 ***					
Organization	0.19 ***	0.10 ***					
Next of kin			0.07 ***				
Standard	0.17 ***	0.08 ***					
Discharge		0.09 ***	0.13 **				

*** $p < 0.001$; ** $p < 0.01$; empty fields are not significant at 0.05 level; Treatment services—second order factor comprising nurse services, doctor services, information, and organization.

3.8. Proposed Measurement Model

A proposed model (Model 11) was developed, taking into consideration the frequencies of missing values for the items and the discriminant validity concerns. Items with missing values of more than 20% were excluded; therefore, the dimensions of “discharge” and “interaction” were removed from the model. The items on “next of kin” had more than 20% but the dimension was maintained. The questions were the following: “NK1: Were your relatives well received by the hospital staff?” and “NK2: Was it easy for your relatives to get information about you while you were in the hospital?” These questions were maintained because, unlike the other dimensions, relating and answering them depended on factors that are largely beyond the control of the patient, such as whether or not the patient had any relatives alive who visited the hospital and whether the patient stayed in the hospital long enough for relatives to visit the hospital. A second-order factor was added in the proposed model for “nurse services”, “doctor services”, “information”, and “organization”, collectively labelled “treatment services”. This was based on the discriminant validity results, correlations among them, and the nature of the questions asked under these dimensions. The two lowest loading items (ORG 2 and ST 5) that were previously deleted were still excluded from this model. The proposed model showed excellent fitness to the data (similar to Model 10) and also met convergent, discriminant, and criterion-related validity requirements. See Figure 2 for the proposed model. Table 8 presents comparisons of tools and findings between the validation study by Pettersen et al. [8] and the current study.

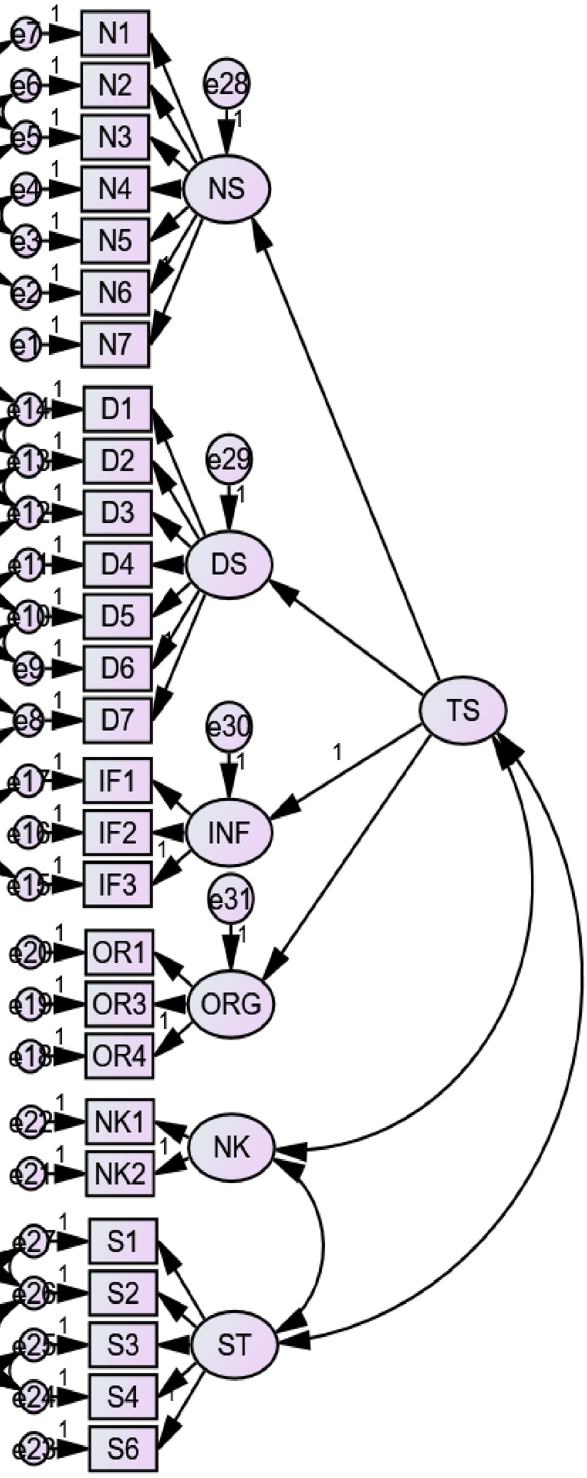


Figure 2. Proposed measurement model. Note: NS—nurse services; DS—doctor services; INF—information; ORG—organization; ST—standard; NK—next of kin; TS—treatment services (second-order factor).

Figure 2. Proposed measurement model. Note: NS—nurse services; DS—doctor services; INF—information; ORG—organization; ST—standard; NK—next of kin; TS—treatment services (second-order factor).

4. Discussion

This study presents some major findings. First, the study confirmed that the eight-factor model showed good fitness to the data. The model achieved configural and metric invariance but not scalar invariance. The study also found that reliability values were all acceptable and all the dimensions, except "standard", attained the recommended 0.50 AVE value for convergent validity. With regard to discriminant validity, "doctor services" (in relation to "information"), "organization" (in relation to "doctor services", "nurse services", and "information") and "standard" (in relation to "organization") had issues. Con-

Table 8. Tools and findings in the earlier validation study and the current study.

Study	Psychometric Tools Used	Findings
Pettersen et al. (2004)	Exploratory factor analysis	10 factors (including general satisfaction)
	Cronbach's alpha test	Confirmed
	Test-retest reliability	Confirmed
	Construct validity	Achieved
Current study	Confirmatory factor analysis	8 factors (excluding general satisfaction)
	Model comparisons	Initial model was found to be best
	Measurement invariance	Configural and Metric achieved, Scalar not achieved
	Composite reliability test	Confirmed
	Convergent validity	Confirmed for all except one factor
	Discriminant validity	Confirmed for all except three factors
	Construct validity	Achieved
	Criterion-related validity	Achieved
	Second-order factor analysis	Achieved composite reliability, convergent validity, discriminant validity, construct validity and criterion related validity

4. Discussion

This study presents some major findings. First, the study confirmed that the eight-factor model showed good fitness to the data. The model achieved configural and metric invariance but not scalar invariance. The study also found that reliability values were all acceptable and all the dimensions, except "standard", attained the recommended 0.50 AVE value for convergent validity. With regard to discriminant validity, "doctor services" (in relation to "information"), "organization" (in relation to "doctor services", "nurse services", and "information") and "standard" (in relation to "organization") had issues. Construct validity and criterion-related validity were supported for majority of the results. One item each under "standard" and "organization" had the lowest loadings. Finally, a model including a second-order factor was proposed. The second-order factor, named "treatment services", consisted of four first-order factors: "nurse services", "doctor services", "information", and "organization". Moreover, the dimensions of "standard" and "next of kin" were included in this final model, but "discharge" and "interaction" were excluded. Hence, the final model included one second-order factor comprising four sub-factors as well as "standard" and "next of kin".

The dimensions with associated items found in this study were similar to those found by Pettersen et al. [8] while some dimensions, such as "doctor services", "nurse services", "organization", "information", and "hospital standards", overlapped with dimensions found by other studies [5,18,23]. Invariance tests conducted in the present study were absent in the study by Pettersen et al. [8], which marks a good contribution of this study. The tests showed that the model achieved invariance across the aggregated departments with regard to structure and pattern (configural) as well as the loadings of the items on their respective dimensions (metric). However, scalar invariance was not achieved for this model. Considering the diverse nature of the sample, as well as the aggregation of the departments into broad categories, this finding was expected. Putnick and Bornstein [37] asserted that scalar invariance is the most stringent compared with configural and metric, and instances of rigid scalar non-invariance could mean that the construct is generally variant across different groups. The findings also showed that reliability was good, based on composite reliability values, similar to the Cronbach's alpha values obtained by Pettersen et al. [8].

With regard to validity tests, the study found that all the dimensions, except "standard", attained the recommended 0.50 AVE value for convergent validity, similar to other related studies that examined similar dimensions using other instruments [4]. However, discriminant validity issues were found for "doctor services" (in relation to "information"), "organization" (in relation to "doctor services", "nurse services", and "information") and "standard" (in relation to "organization"). Discriminant validity was also missing in the study by Pettersen et al. [8], thus indicating another good contribution of this study. Examining the wordings of their items gives some possible explanation for this finding. For instance, D1 under "doctor services" was worded as "Did the doctors talk to you so you understood them?", while questions under "information" included "IF2. Did you know what you thought was necessary about the results of tests and examinations?" and "IF3. Did you receive sufficient information about your diagnosis or your complaints?" It is highly likely that patients will receive information on results and diagnosis mainly from their doctors and, as such, answering questions under "information" may be significantly influenced by the perception of how well the doctors spoke to these patients. Similarly, questions under "organization" were "OR1. Did you find that there was a permanent group of nursing staff that took care of you?", "OR2. Did you find that one doctor had the main responsibility for you?", "OR3. Did you find that the hospital's work was well organized?", and "OR4. Did you find that important information about you had come to the right person?" These questions feature clear wording relating to "nurse services", "doctor services", "information", and "standard", and it is therefore not surprising that no clear distinctions were found among them as constructs. Construct validity was also achieved with a majority of the items recording loadings of above 0.60. This was also achieved in the validation study by Pettersen et al. [8] using a different method and in related studies using other instruments with similar dimensions [5,18]. One item on "standard" and one on "organization" were, however, deleted due to loadings below 0.60, while another on "standard" was deleted in a bid to improve the discriminant validity. Perhaps the wording of these questions made them difficult for patients to understand clearly and respond accordingly. For instance, item S5 was framed as "Was the food satisfactory?" Patients may be left to decide what is meant by "satisfactory", thus making the question too vague, or perhaps the different dietary requirements and preferences made this question more loosely defined. Again, item OR2 was framed as "Did you find that one doctor had the main responsibility for you?", a question probably dependent on the ailments of the patient and likely to be out of the control of hospital organization. Thus, if a patient's ailments require more than a single main doctor, then this question may suggest to the patient that having two or more main doctors reduces the ability of the hospitals to organize their work well. Criterion-related validity was ascertained for the overall measure as well as the dimensions in predicting at least one of the three outcome variables: satisfaction, health benefits, and health level, which is consistent with previous studies [2,38–40].

Lastly, a model with a second-order factor, "treatment services", for four of the dimensions was proposed based on the results of the validity and reliability analyses: "nurse services", "doctor services", "information", and "organization". This constitutes the most important contribution of this study since this possibility was not explored in the study by Pettersen et al. [8], perhaps owing to the absence of discriminant validity examinations in their study, and since this indicates a change in the factor structure of the PEQ. Rindskopf and Rose [41] observed that second-order factors reflect relationships among first-order factors. It is worth noting that related studies that developed other PREMs for generic and specific health issues also found these four dimensions in common [5,17,23]. Although these studies did not develop a second-order factor for these dimensions, this is indicative of the prominence of these four variables in measuring and understanding patient experiences. The current finding, therefore, builds on this prominence to illustrate the high interrelationships and inextricable links among these factors, which brings some theoretical and practical implications to the fore.

4.1. Theoretical Implications

This study brings a very important, yet mostly ignored, contribution to the patient experience and quality healthcare literature: a need for more validation studies and surveys on patient experiences. The study responds to the recommendation by Pettersen et al. [8] that existing PREMs require scrutiny and also tackles the research gap identified in the matrix by Beattie et al. [19], indicating that the PEQ by Pettersen et al. [8] lacked some validity analyses. This buttresses the claim that, indeed, changing statistical methods and tools can reveal weaknesses of measures; moreover, this should be countered by regular psychometric appraisals of these measures. The results also contribute to the views of some researchers [20,21], regarding the need to repeat patient experience surveys to generate more reliable data for policy-making. The assessment of patients' perspectives of hospital care would have to be reliable and valid enough in order to elicit accurate information about their experiences, constructs, and outcomes. Thus, it is imperative to ensure that these instruments always perform optimally and generate reliable information on how to improve quality of care and hospital experiences. These results, therefore, provide a background for further studies to be conducted on PREMs.

Another major contribution of this study is the finding of a second-order factor labelled "treatment services", which consists of four factors: "nurse services", "doctor services", "information", and "organization". This means that there exist strong and significant relationships among these dimensions [41]. This finding also means that a single dimension or factor could adequately account for all four dimensions and could be identified as a major sub-dimension that captures these four dimensions. The "treatment services" factor has implications for the conceptualization of patient-oriented hospital service climates. Patients in these hospitals may have highly overlapping experiences across "nurse services", "doctor services", "organization", and "information". In more specific terms, it can be said that these patients experience a main dimension that accounts for significant portions of the four dimensions, perhaps because of the way these factors play out in the hospitals. For instance, doctors provide information regarding patients' health, ailments, and treatments while nurses organize and assist patients with the treatment process. This is significant in advancing knowledge of patient experiences. The experience of these four dimensions may not be that distinct, and patients, in experiencing service climate in the hospitals, may not adequately distinguish their shared perceptions of "doctor services" from "information" or of "nurse services" from "organization", for instance. The climate in the hospitals during healthcare delivery may thus be experienced and perceived by patients as having two levels of factors. This contribution is also a major highlight when compared with the study by Pettersen et al. [8], in which discriminant validity was not examined and a resulting second-order factor analysis was not explored. This challenges the theoretical structure of the PEQ and theoretical distinctness among these factors. Therefore, this study suggests a change in the factor structure of the PEQ and the development of a second-order factor for these four dimensions in the general patient experience literature. These possibilities are worth exploring in further surveys and studies on hospital factors as patient experiences during the caregiving process.

4.2. Practical Implications

Quality healthcare delivery is not exclusive to a region or country but a general goal of all healthcare systems worldwide. This can be contributed to by generating accurate information on how healthcare users experience healthcare systems. The results from this study suggest that it is not enough to develop a good measure of patient experiences, but it is imperative to review and reassess the ability of the measure to keep generating accurate information on patients' experiences and health. The questions in the PEQ may have to be revised in order to elicit more concise and accurate information from patients. Furthermore, some dimensions, such as "next of kin", seemed not to be relatable to most of the patients, judging from the many missing values and invariance tests. In addition, the PEQ should be administered with the second-order factor taken into consideration. It is imperative to analyse "nurse services", "doctor services", "information", and "organization" as a second-order factor, as shown in the proposed model, due to the validity issues that were realized in the analysis. This can provide researchers and management with adequate knowledge on what patients experience during the caregiving process. Moreover, management must take the interrelationships in the second-order factor into account to make meaningful, informed, and sustainable changes in the hospitals for patients. The second-order factor must be considered as a single factor encompassing these four dimensions, where patients' perceptions and interactions with a dimension have a ripple effect on the others. Such considerations in policies and practice can help management and workers to reduce errors that may have dire consequences.

4.3. Limitations and Directions for Future Research

This study employs data that is not at the national level but from a health region in Norway. That notwithstanding, the study has good generalizability power owing to the similarity in hospital and healthcare systems across the regions in Norway. Generalizing to other countries, however, is difficult due to the differences in culture and healthcare systems. The findings require additional research in different countries for further justification. Therefore, future studies on reassessing psychometric properties of PREMs may want to employ larger data sets, for instance at the national level or across regions, to further investigate and develop the measurement quality of such surveys. Furthermore, future research should adopt the proposed model (with the second-order factor) from this study and examine it empirically to confirm it or otherwise, within health sectors across different countries. It is also worth noting that only nurses' and doctors' services were assessed but not the services of other healthcare professionals in hospitals. Future research on developing and improving PREMs should therefore incorporate questions that assess the experience of services of other professionals.

5. Conclusions

Hospital management should know and consider the views and experiences of the people they care for if their services are to be influential in improving patients' health. The results of this study show that changes in psychometric analytical tools and methods can indeed highlight possible weaknesses and inadequacies in measures, as seen with the PEQ. This is evident in analyses such as invariance, discriminant validity, and second-order factors conducted in the current study but absent in the earlier study. Therefore, repeated surveys with refined and further developed questionnaires are needed to hopefully improve the performance of the measures. The results also indicate possible changes with regard to dimensionality of PREMs, owing to the second-order factor finding. This calls for adequate attention, from researchers and hospital management alike, to the interrelationships among some of the dimensions, as this has important implications for theory and practice in healthcare. Management should consider these relationships in making decisions concerning the quality of care for patients, while researchers should delve more into studies that ascertain the psychometrics and dimensionality of PREMs.

Supplementary Materials: The following are available online at https://www.mdpi.com/article/10.3390/ijerph18137141/s1, Table S1. Metric invariance across department aggregates; Table S2. Scalar invariance across department aggregates.

Author Contributions: Conceptualization, S.A.A., E.O., and R.J.M.; methodology, S.A.A. and E.O.; formal analysis, S.A.A.; investigation, S.A.A.; data curation, E.O. and S.A.A.; writing—original draft preparation, S.A.A.; writing—review and editing, E.O. and R.J.M.; supervision, E.O. and R.J.M. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: This study, with regard to data collection, analysis, and compilation, was conducted within the ethical and legal provisions and guidelines of the Norwegian Institute for Public Health (NIPH) and the University of Stavanger. The Norwegian Data Protection Authority and the Norwegian Directorate of Health approved the procedures in the survey. The hospital data protection official assessed the data processing in the hospitals where survey extension took place.

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The data presented in this study are available on request from the corresponding author. The data are not publicly available due to an ongoing research project.

Acknowledgments: This study used anonymous data from the Norwegian Institute of Public Health. The interpretation and reporting of the data are the responsibility of the authors. We thank Ingeborg Strømseng Sjetne for preparing the data for this study and for her useful comments and suggestions.

Conflicts of Interest: The authors declare no conflict of interest.

References

1. Joober, H.; Chouinard, M.-C.; King, J.; Lambert, M.; Hudon, É.; Hudon, C. The patient experience of integrated care scale: A validation study among patients with chronic conditions seen in primary care. *Int. J. Integr. Care.* **2018**, *18*, 1–8. [CrossRef] [PubMed]
2. Bjertnaes, O.A.; Sjetne, I.S.; Iversen, H.H. Overall patient satisfaction with hospitals: Effects of patient-reported experiences and fulfilment of expectations. *BMJ Qual. Saf.* **2012**, *21*, 39–46. [CrossRef] [PubMed]
3. Pitter, J.G.; Csanádi, M.; Szigeti, A.; Lukács, G.; Kovács, Á.; Moizs, M.; Repa, I.; Zemplényi, A.; Thomas Czypionka, T.; Kraus, M.; et al. Planning, implementation and operation of a personalized patient management system for subjects with first suspect of cancer (OnkoNetwork): System description based on a qualitative study. *BMC Health Serv. Res.* **2019**, *19*, 131. [CrossRef]
4. Garratt, A.M.; Bjærtnes Ø, A.; Krogstad, U.; Gulbrandsen, P. The OutPatient Experiences Questionnaire (OPEQ): Data quality, reliability, and validity in patients attending 52 Norwegian hospitals. *BMJ Qual. Saf.* **2005**, *14*, 433–437. [CrossRef]
5. Iversen, H.H.; Holmboe, O.; Bjertnæs, Ø.A. The Cancer Patient Experiences Questionnaire (CPEQ): Reliability and construct validity following a national survey to assess hospital cancer care from the patient perspective. *BMJ Open* **2012**, *2*, e001437. [CrossRef]
6. Jenkinson, C.; Coulter, A.; Bruster, S. The Picker Patient Experience Questionnaire: Development and validation using data from in-patient surveys in five countries. *Int. J. Qual. Health Care* **2002**, *14*, 353–358. [CrossRef] [PubMed]
7. Oltedal, S.; Garratt, A.; Bjertnæs, Ø.; Bjørnsdottìr, M.; Freil, M.; Sachs, M. The NORPEQ patient experiences questionnaire: Data quality, internal consistency and validity following a Norwegian inpatient survey. *Scand. J. Public Health* **2007**, *35*, 540–547. [CrossRef]
8. Pettersen, K.I.; Veenstra, M.; Guldvog, B.; Kolstad, A. The Patient Experiences Questionnaire: Development, validity and reliability. *Int. J. Qual. Health Care.* **2004**, *16*, 453–463. [CrossRef]
9. Wolf, C.; Jason, A. Defining patient experience. *Patient Exp. J.* **2014**, *1*, 7–19.
10. Wagland, R.; Recio-Saucedo, A.; Simon, M.; Bracher, M.; Hunt, K.; Foster, C.; Downing, A.; Glaser, A.; Corner, J. Development and testing of a text-mining approach to analyse patients' comments on their experiences of colorectal cancer care. *BMJ Qual. Saf.* **2016**, *25*, 604–614. [CrossRef] [PubMed]
11. Donabedian, A. The quality of care: How can it be assessed? *Jama* **1988**, *260*, 1743–1748. [CrossRef]
12. Glickman, S.W.; Baggett, K.A.; Krubert, C.G.; Peterson, E.D.; Schulman, K.A. Promoting quality: The health-care organization from a management perspective. *Int. J. Qual. Health Care* **2007**, *19*, 341–348. [CrossRef]
13. Lawson, E.F.; Yazdany, J. Healthcare quality in systemic lupus erythematosus: Using Donabedian's conceptual framework to understand what we know. *Int. J. Clin. Rheumatol.* **2012**, *7*, 95. [CrossRef]
14. Netemeyer, R.G.; Bearden, W.O.; Sharma, S. *Scaling Procedures: Issues and Applications*; Sage Publications: Thousand Oaks, CA, USA, 2003.
15. DeVellis, R.F. *Scale Development: Theory and Applications*; Sage Publications: Thousand Oaks, CA, USA, 2016.
16. Bruyneel, L.; Tambuyzer, E.; Coeckelberghs, E.; De Wachter, D.; Sermeus, W.; De Ridder, D.; Ramaekers, D.; Weeghmans, I.; Vanhaecht, K. New Instrument to Measure Hospital Patient Experiences in Flanders. *Int. J. Environ. Res. Public Health* **2017**, *14*, 1319. [CrossRef] [PubMed]
17. Garratt, A.M.; Bjertnæs, Ø.A.; Barlinn, J. Parent experiences of paediatric care (PEPC) questionnaire: Reliability and validity following a national survey. *Acta Paediatrica* **2007**, *96*, 246–252. [CrossRef] [PubMed]
18. Garratt, A.M.; Danielsen, K.; Forland, O.; Hunskaar, S. The Patient Experiences Questionnaire for Out-of-Hours Care (PEQ-OHC): Data quality, reliability, and validity. *Scand. J. Prim. Health Care* **2010**, *28*, 95–101. [CrossRef] [PubMed]
19. Beattie, M.; Murphy, D.J.; Atherton, I.; Lauder, W. Instruments to measure patient experience of healthcare quality in hospitals: A systematic review. *Syst. Rev.* **2015**, *4*, 97. [CrossRef] [PubMed]
20. Haugum, M.; Danielsen, K.; Iversen, H.H.; Bjertnaes, O. The use of data from national and other large-scale user experience surveys in local quality work: A systematic review. *Int. J. Qual. Health Care* **2014**, *26*, 592–605. [CrossRef] [PubMed]
21. Manary, M.P.; Boulding, W.; Staelin, R.; Glickman, S.W. The patient experience and health outcomes. *N. Engl. J. Med.* **2013**, *368*, 201–203. [CrossRef]
22. Garratt, A.; Danielsen, K.; Bjertnaes, Ø.; Ruud, T. PIPEQ—A method for measurement of user satisfaction in mental health services. *Tidsskr. Den Nor. Laegeforening Tidsskr. Prakt. Med. Ny Raekke* **2006**, *126*, 1478–1480.
23. Sjetne, I.S.; Bjertnaes, O.A.; Olsen, R.V.; Iversen, H.H.; Bukholm, G. The Generic Short Patient Experiences Questionnaire (GS-PEQ): Identification of core items from a survey in Norway. *BMC Health Serv. Res.* **2011**, *11*, 88. [CrossRef]

24. Ahern, M.; Dean, C.M.; Dear, B.F.; Willcock, S.M.; Hush, J.M. The experiences and needs of people seeking primary care for low-back pain in Australia. *Pain Rep.* **2019**, *4*, e756. [CrossRef]
25. Bjertnaes, O.; Deilkås, E.T.; Skudal, K.E.; Iversen, H.H.; Bjerkan, A.M. The association between patient-reported incidents in hospitals and estimated rates of patient harm. *Int. J. Qual. Health Care* **2014**, *27*, 26–30. [CrossRef]
26. Bjorngaard, J.H.; Garratt, A.; Grawe, R.W.; Bjertnaes, Ø.A.; Ruud, T. Patient experiences with treatment in private practice compared with public mental health services. *Scand. J. Psychol.* **2008**, *49*, 385–392. [CrossRef] [PubMed]
27. Hinsley, K.; Kelly, P.J.; Davis, E. Experiences of patient-centred care in alcohol and other drug treatment settings: A qualitative study to inform design of a patient-reported experience measure. *Drug Alcohol Rev.* **2019**, *38*, 664–673. [CrossRef] [PubMed]
28. Hair, J.; Black, W.; Babin, B.; Anderson, R.; Tatham, R. *Multivariate Data Analysis*, 6th ed.; Pearson Prentice Hall: Hoboken, NJ, USA, 2006.
29. Schreiber, J.B.; Nora, A.; Stage, F.K.; Barlow, E.A.; King, J. Reporting structural equation modeling and confirmatory factor analysis results: A review. *J. Educ. Res.* **2006**, *99*, 323–338. [CrossRef]
30. Hu Lt Bentler, P.M. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Struct. Equ. Modeling A Multidiscip. J.* **1999**, *6*, 1–55.
31. Hair, J.F., Jr.; Sarstedt, M.; Hopkins, L.; Kuppelwieser, V.G. Partial least squares structural equation modeling (PLS-SEM). *Eur. Bus. Rev.* **2014**, *26*, 106–121. [CrossRef]
32. Fornell, C.; Larcker, D.F. Evaluating structural equation models with unobservable variables and measurement error. *J. Mark. Res.* **1981**, *18*, 39–50. [CrossRef]
33. Tabachnick, B.G.; Fidell, L.S. *Using Multivariate Statistics*; Cal Harper Collins: Northridge, CA, USA, 1996.
34. Vandenberg, R.J.; Lance, C.E. A review and synthesis of the measurement invariance literature: Suggestions, practices, and recommendations for organizational research. *Organ. Res. Methods* **2000**, *3*, 4–70. [CrossRef]
35. MacKenzie, S.B.; Podsakoff, P.M.; Podsakoff, N.P. Construct measurement and validation procedures in MIS and behavioral research: Integrating new and existing techniques. *MIS Q.* **2011**, *35*, 293–334. [CrossRef]
36. Gaskin, J.; Lim, J. Master Validity Tool. *AMOS Plugin Gaskination's StatWiki*. 2016. Available online: http://statwiki.kolobkreations.com (accessed on 20 May 2017).
37. Putnick, D.L.; Bornstein, M.H. Measurement invariance conventions and reporting: The state of the art and future directions for psychological research. *Dev. Rev.* **2016**, *41*, 71–90. [CrossRef] [PubMed]
38. Blazquez, R.A.; Ferrandiz, E.F.; Caballero, V.G.; Corchon, S.; Juarez-Vela, R. Women's satisfaction with maternity care during preterm birth. *Birth* **2019**, *46*, 670–677. [CrossRef] [PubMed]
39. Taylor, F.; Halter, M.; Drennan, V.M. Understanding patients' satisfaction with physician assistant/associate encounters through communication experiences: A qualitative study in acute hospitals in England. *BMC Health Serv. Res.* **2019**, *19*, 603. [CrossRef]
40. Lapin, B.R.; Honomichl, R.; Thompson, N.; Rose, S.; Abelson, A.; Deal, C.; Katzan, I.L. Patient-reported experience with patient-reported outcome measures in adult patients seen in rheumatology clinics. *Qual. Life Res.* **2021**, *30*, 1073–1082. [CrossRef] [PubMed]
41. Rindskopf, D.; Rose, T. Some theory and applications of confirmatory second-order factor analysis. *Multivar. Behav. Res.* **1988**, *23*, 51–67. [CrossRef]

PAPER 3

Can we trust what patients say? A latent growth curve on the associations between patient experience and hospital-associated infections in Norway over time.

Seth Ayisi Addo