

**THE ASSESSMENT OF ENVIRONMENT OF CARE
IN HOSPITAL USM THROUGH IN-PATIENT
SATISFACTION SURVEY AND
WARD RATING AUDIT**

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UNIVERSITI SAINS MALAYSIA

2021

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DR. AHMAD BADRURIDZWANULLAH BIN ZUN

**Thesis Submitted in Partial Fulfilment of the
Requirement for the Degree of Doctor of Public
Health (Health System Management)**

UNIVERSITI SAINS MALAYSIA

Feb 2021

ACKNOWLEDGEMENT

In the name of Allah, the Most Gracious and the Merciful

Alhamdulillah, All praises to Allah for the strengths and His blessing in completing this thesis. I would like to express my gratitude and appreciation to all those who gave me the possibility to complete this report especially to my supervisor Associate Professor Dr. Mohd Ismail Bin Ibrahim for his supervision and continuous support throughout the process of doing this research and thesis works lead to the success of this research. I will be forever grateful for his guidance, support, and enthusiasm for the past three years. My co-supervisor, Professor Dato Dr. Ahmad Sukari Bin Halim, and Dr. Ariffin Marzuki Bin Mokhtar for their support, willingness in providing constructive suggestions, proofreading, and countless effort generously channelled towards this project. Their contribution was invaluable and shall always be treasured.

I would also like to acknowledge with much appreciation to Associate Professor Dr. Aziah Binti Daud, Head of Department Community of Medicine, and all lecturers in the Department of Community Medicine, School of Medical Sciences, Universiti Sains Malaysia throughout my four years for their support and guidance.

Last but not least, my deepest gratitude goes to my beloved parents; Mr. Zun Bin Kamarudin and Mrs. Nor Kamariah Binti Shamsudin and not to forget my parents' in-laws for their endless love, prayers, and encouragement. I am also greatly indebted and appreciate very much to my beloved wife, Dr. Sarah Binti Zulkarnain for her encouragement, support, and sacrifices throughout the study. To all my children, Omar Mubarak, Khawlah Auni, Mariah Khayra, and Anas Ferhad thanks a lot for inspiring me in their ways in the accomplishment of this study.

Thank you Allah, and thank you all once again.

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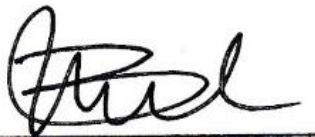
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DECLARATION

I, Ahmad Badruridzwanullah Bin Zun, declare that the work presented in this thesis is originally mine. The information which has been derived from other sources is indicated in the thesis.



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Student ID: P-UD 0010/17

Signed on the 15 December 2020

LIST OF PAPERS AND CONFERENCES

During my Doctor of Public Health (DrPH) course, the following articles and abstracts were accepted for publication and/or presented in conferences of both national and international levels. Overall, this thesis comprises of the three following papers, which corresponds to five specific objectives:

Publications:

1. Zun, A. B., Ibrahim, M. I., Mokhtar, A. M., Halim, A. S., Mansor, W. & Arifin, W. N. (2019). Translation, Cross-Cultural Adaptation, and Validation of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) into the Malay Language *International Journal of Environmental Research and Public Health* doi:10.3390/ijerph16112054

Conference Presentation and Published Conference Proceedings:

1. 1st International Borneo Healthcare & Public Health Conference 4th - 5th September 2019, UMS Sabah

The correlation between Environment of Care, Patient Satisfaction and Willingness to Recommend in a teaching hospital setting. (Oral presentation)

Publication Zun, A. B., Ibrahim, M. I., Mokhtar, A. M., Halim, A. S., Mansor, W. & Arifin, W. N. (2019). The correlation between Environment of Care, Patient Satisfaction and Willingness to Recommend in a teaching hospital setting Malaysian Journal of Medicine and Health Sciences Vol.15 Supp 6, October 2019 (eISSN 2636-9346)

2. 3rd ICMHS-International Conference on Medical and Health Sciences & 24th NCMHS-National Conference on Medical and Health Sciences, 20th - 21st August 2019, Kota Bharu, Kelantan.

Patient Experience, Patient Satisfaction, Willingness to Recommend and Its Correlation (Poster presentation).

3. Persidangan Kebangsaan Kali Ke -2 Pusat Perubatan Akademik: 16 - 17 Oktober 2019, Dewan Za'ba, Kementerian Pendidikan Malaysia, Putrajaya.

In-Patient Satisfaction Level And Its Associated Factor For A Teaching Hospital In The East Coast Of Malaysia (Poster presentation).

Publication Zun, A. B., Ibrahim, M. I., Mokhtar, A. M., Halim, A. S., Mansor, W. & Arifin, W. N. (2019). In-Patient Satisfaction Level And Its Associated Factor For A Teaching Hospital In The East Coast Of Malaysia. UKM Medicine & Health Journal Vol. 14, No. 1 (suppl), 2019

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- Appendix D** Draft of backward translation of HCAHPS from Malay Language to English
- Appendix E** Ward Rating Audit Checklist
- Appendix F** Research information sheet and Consent Forms
- Appendix G** Ethical approval from Research and Ethics Committee, Universiti Sains Malaysia
- Appendix H** Research approval from Hospital USM Director
- Appendix I** Publication 1

LIST OF ABBREVIATION

Abbreviation

ADKAR	Awareness, Desire, Knowledge, Ability, and Reinforcement Model
EoC	Environment of Care
EFA	Exploratory Factor Analysis
HAI	Hospital Associate Infection
HCAHPS	Hospital Consumer Assessment of Healthcare Providers and Systems
HSPA	Health Services Performance Agreements Program
HDW	High Dependency Ward
ICU	Intensive Care Unit
IPSG	International Patient Safety Goal
JCI	Joint Commission International
NHS	National Health Strategy
SEIPS	System Engineering Initiative Patient Safety
TH	Teaching Hospital
USM	Universiti Sains Malaysia
USA	United State of America
WHO	World Health Organization
WRI	Ward Rating Initiative

LIST OF SYMBOLS

$>$	More than
$<$	Less than
$=$	Equal to
α	Alpha
β	Beta
$\%$	Percentage
N	Population size
Z	Z statistic for a level of confidence (1.96)
d	Precision
f	Effect size

ABSTRAK

PENILAIAN PERSEKITARAN PENJAGAAN DI HOSPITAL USM MELALUI TINJAUAN KEPUASAN PESAKIT DALAM DAN AUDIT PENILAIAN WAD

Latar belakang: Salah satu elemen dalam kualiti penjagaan kesihatan yang kurang diberi perhatian adalah persekitaran penjagaan (EoC) yang terdiri daripada persekitaran sosial dan persekitaran fizikal. Persekitaran penjagaan boleh memberi kesan pada pesakit sama ada terhadap persepsi pesakit atau hasil klinikal pesakit. Kedua-dua komponen ini dapat dinilai berdasarkan penilaian subjektif melalui tinjauan kepuasan pesakit. Tahap kepuasan pesakit boleh dinilai menggunakan Penilaian Pengguna Hospital bagi Penyedia dan Sistem Penjagaan Kesihatan (HCAHPS) yang merupakan instrumen piawai untuk menilai persekitaran penjagaan di Amerika Syarikat secara nasional. Sementara itu, persekitaran fizikal juga dapat dinilai berdasarkan penilaian objektif melalui tinjauan audit penilaian wad menggunakan senarai semak audit penilaian wad yang terdiri daripada tujuh kriteria oleh juruaudit terlatih. Oleh itu objektif kajian adalah untuk menentukan persepsi pesakit terhadap persekitaran penjagaan (EoC), tahap kepuasan pesakit dan faktor perkaitannya; skor penilaian wad sebagai ukuran objektif untuk EoC fizikal dan hubungan antara ukuran subjektif dan ukuran objektif EoC fizikal.

Kaedah: Kajian ini dilakukan dalam dua bahagian. Bahagian pertama melibatkan terjemahan dan pengesahan soal selidik versi Bahasa Melayu dari Penilaian Pengguna Hospital bagi Penyedia dan Sistem Penjagaan Kesihatan (HCAHPS) dan bahagian kedua terdiri daripada dua tinjauan yang merupakan tinjauan kepuasan pesakit dan tinjauan audit peringkat wad. Pada bahagian pertama, proses terjemahan dilakukan

dengan menggunakan terjemahan ke depan dan ke belakang. Proses pengesahan kemudian dilanjutkan dengan kesahan kandungan, kesahan wajah dan kesahan konstruk. Proses ujian lapangan untuk versi Bahasa Melayu HCAHPS dilakukan di antara 200 pesakit yang dikeluarkan dari Hospital USM. Pada bahagian kedua, terdapat dua tinjauan yang dilakukan, pertama, tinjauan kepuasan pesakit yang melibatkan 547 pesakit yang dibenarkan pulang dalam menentukan persepsi pesakit terhadap persekitaran penjagaan, tahap kepuasan pesakit dan faktor yang berkaitan. Kedua, tinjauan audit peringkat wad sebagai penilaian objektif persekitaran fizikal dilakukan bersamaan dengan tinjauan kepuasan pesakit melibatkan 13 wad.

Keputusan: Indeks pengesahan kandungan keseluruhan (CVI) dikira 0,87 dan iCVI untuk item individu berkisar antara 0,8 hingga 1,0. Indeks kesahan wajah (FVI) kejelasan dan pemahaman masing-masing adalah 0.83 dan 0.82, dan FVI universal adalah 0.82. Untuk kesahan konstruk, pemuatan faktor antara 0,652 hingga 0,961 dalam sembilan domain. Keseluruhan alpha Cronbach untuk versi HCAHPS-Bahasa Melayu ditentukan menjadi 0,84 dan nilai untuk setiap domain antara 0,69 hingga 0,93. Kira-kira tiga perlima responden berpuas hati dengan perkhidmatan hospital. Kira-kira 15.4% hingga 36.9% pesakit mempunyai tahap persepsi positif di semua domain EoC. Tahap pendapatan pesakit and domain komunikasi pesakit dan doktor dikaitkan secara signifikan dengan tahap kepuasan dengan (adj. OR = 0.38; 95% CI 0.17,0.88; P = 0.023) dan (adj. OR = 3.23; 95% CI: 2.01 , 5.19; p <0.001) masing-masing. Skor persepsi untuk persekitaran fizikal terdiri dari kebersihan persekitaran hospital adalah 3.11 (\pm 0.94) sementara persekitaran senyap hospital adalah 2.52 (\pm 1.24). Untuk ukuran objektif persekitaran fizikal, kepatuhan kawalan jangkitan mempunyai skor min tertinggi (4.42 \pm 0.40) sementara kebersihan fizikal dan domain keselamatan pesakit berkongsi skor min terendah masing-masing dengan 3.92 \pm 0.51 dan 3.92 \pm 0.83.

Terdapat hubungan positif antara persepsi kebersihan dan ukuran objektif kebersihan persekitaran ($r = 0,08$, nilai $p < 0,05$), lingkungan yang aman ($r = 0,14$, nilai $p < 0,01$), dan lingkungan yang kondusif ($r = 0,11$, nilai $p < 0,01$).

Kesimpulan: Kajian ini memberi peluang untuk peningkatan kualiti persekitaran penjagaan di Hospital USM terutama pada persekitaran sosial kerana peratusan persepsi positif di kalangan pesakit dianggap rendah dan domain komunikasi dengan doktor dikaitkan dengan tahap kepuasan rendah. Selain itu, persekitaran fizikal juga perlu ditingkatkan kerana dapat berkait rapat dengan kawalan jangkitan hospital dan keselamatan pesakit.

KATA KUNCI: Persekitaran penjagaan, persekitaran penjagaan fizikal, kepuasan pesakit, hospital pengajar

ABSTRACT

THE ASSESSMENT OF ENVIRONMENT OF CARE IN HOSPITAL USM THROUGH IN-PATIENT SATISFACTION SURVEY AND WARD RATING AUDIT SURVEY

Background: One element in healthcare quality that being less highlighted is the environment of care (EoC) which consists of the social EoC and physical EoC. The EoC can have an impact on patient outcome either on patient perception or clinical patient outcome. These two components can be assessed based on subjective assessment through patient satisfaction survey. Patient satisfaction level can be assess using Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) which is a standardize instrument to assess EoC in USA nationally. Meanwhile, physical EoC also can be assessed based on objective assessment through wards rating audit survey using the ward rating audit checklist that consist of seven criteria by the trained auditors. Hence the objective of the study was to determine the patient's perception of EoC, in-patient satisfaction level and their association; ward rating score as the objective measure for phsical EoC and the correlation between subjective measure and objective measure of physical EoC.

Methods: The study was conducted in two parts. Part one involved the translation and validation of the Malay version of the Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) questionnaire and part two consists of two surveys which were in-patient satisfaction survey and ward rating audit survey. In part one, the translation process was conducted using the forward and backward translation. The validation process then proceed with content validity, face validity and construct

validity. The field testing process for HCAHPS Malay version was conducted among 200 discharged patients from Hospital USM. In part two, there were two surveys conducted, first, in-patient satisfaction survey that involved 547 discharged patients in determining the patient perception on EoC, patient satisfaction level and its associated factor. Second, the ward rating audit survey as an objective assessment of physical EoC was conducted concurrently with an in-patient satisfaction survey involving 13 wards.

Result: The overall content validation index (CVI) was calculated to be 0.87 and iCVI for individual items ranged from 0.8 to 1.0. The face validity index (FVI) of clarity and comprehension were 0.83 and 0.82, respectively, and the FVI universal was 0.82. For construct validity, the factor loading ranging from 0.652 to 0.961 within nine domains. The overall Cronbach alpha for the HCAHPS-Malay version was determined to be 0.84 and values for each domain ranging from 0.69 to 0.93. About three fifth of respondents were satisfied with hospital services. About 15.4% to 36.9% of the patients have positive perception level in all EoC domains. The income level of the patient and doctor–patient communication domain was significantly associated with satisfaction level with (adj. OR = 0.38; 95% CI 0.17,0.88; P =0.023) and (adj. OR = 3.23; 95% CI: 2.01, 5.19; p < 0.001) respectively. The perception score for the physical EoC comprised of cleanliness of the hospital environment was 3.11 (\pm 0.94) while quietness of the hospital environment was 2.52 (\pm 1.24). For objective measure of physical EoC, compliance of infection control had the highest mean score (4.42 \pm 0.40) while physical cleanliness and patient safety domain shared the lowest mean score with 3.92 \pm 0.51 and 3.92 \pm 0.83 respectively. There was a positive correlation between the perception of cleanliness and an objective measure of a cleanliness of environment

($r=0.08$, p value <0.05), safe environment ($r= 0.14$, p value <0.01), and conducive environment ($r = 0.11$, p value <0.01).

Conclusion: This study provides an opportunity for improvement of EoC in Hospital USM especially on the social EoC as the proportion of positive perception among patient was considered low and the domain on communication with doctor was associated with low satisfaction level. Besides that, the physical EoC also need to be improved since it can be closely related with hospital infectious control and patient safety.

Keywords: Environment of care, physical environment of care, in-patient satisfaction, teaching hospital

CHAPTER ONE: INTRODUCTION

1.1 Introduction

The healthcare quality is one of the critical aspects in healthcare service delivery. The National Academy of Medicine (formerly known as Institute of Medicine) had developed the healthcare quality framework which consists of six components; safety, effectiveness, patient centeredness, timeliness, efficient and equitable (Institute of Medicine, 2005). This framework helps and guides healthcare organizations for the improvement of quality and safety aspects while providing the healthcare services. The challenging environments such as rapid development of technology, demographic factors, changes in lifestyles, increase healthcare costs, and limited resources required continuous quality improvement process in healthcare setting (Koumpouros, 2013; Kunz and Schaaf, 2011). Furthermore, the limited resources create greater pressure for healthcare organization to implement effective services during daily operations. Other than that, managing healthcare cost while meeting customer demand for equitable and quality health services is a crucial issue in the current healthcare system (Ahmed *et al.*, 2017). Despite the scientific and technological development, healthcare systems still facing issues regarding patient dissatisfaction and service inefficiency.

In recent years, the role of technology and built environment are given priority in the holistic management of patients. Creating healing and safe environment have become the focus for healthcare organization in providing healthcare services (van Hoof *et al.*, 2012).

1.2 The Environment of Care (EoC)

The framework of healthcare quality proposed by Donabedian (1988) is comprised of structures (e.g., healthcare system and hospital buildings), processes (e.g., delivery of care and treatment), and outcomes (e.g., patient satisfaction and mortality rates). The structure was defined as the resources necessary to carry out the process and it can be referred to the environment of care (EoC). According to Joint Commission International (2016), EoC is defined as the interface between the patient and the organization which provides both a practical and safe area for patient care. The EoC consists of six distinct components, namely; concepts, systems, layout, physical environment, people, and implementation, through which individuals receive health care (Marcus and Sachs, 2013). There are two major components of the EoC which are social environments and physical environment (Andrade *et al.*, 2013).

1.2.1 Social environment of care

Social environment refers to the interaction between healthcare staff and their clients, either patients or relatives. It includes any contact and interaction with the healthcare staff during hospital admission, such as communication with healthcare staff including doctors or nurses, receiving information about their medication, management of pain and their discharge plan (Rapport *et al.*, 2019). This aspect is also considered as the staff domain factors that consist of staff attitude, staff communication, staff empathy during interaction with the client which can affect the quality of healthcare services.

1.2.2 Physical environment

The first impression that a patient received and perceived as the quality of healthcare is physical environment. This impression is influenced by the hospital environment, which are clean and quiet, layout and design of the building, as well as decoration of the hospital. The interior design of a building consists of global features—such as building configuration, floor layout, and functional distribution, and local features—such as room configuration, colour, furniture, artwork, environmental graphic and natural views. Besides that, the indoor environment of a building is consists of noise, lighting conditions, ambient temperature, and air quality (Rashid, 2007).

The Joint Commission International (JCI) has come out with the standard for environment of care (EoC) which focusing on physical environment (The Joint Commission, 2013). There are six components of EoC standard comprised of 1) safety, 2) security, 3) hazardous materials and waste, 4) fire safety, 5) medical equipment, and 6) utilities. There are two most common indicator that widely use in the assessment of patient perception on physical environment which are cleanliness of environment and quietness of environment (Kenny and Martin, 2016). The cleanliness of environment is considered as a crucial factor, not only as a primary measure to control the infection risk, but also as an indicator of the commitment of hospital staff and the organization. Quietness is also an important factor because it is directly related to the in-patient's needs for rest or sleep.

The physical environment can have an impact on the patient's outcome which are patient satisfaction level and patient clinical outcome such as healing process, recovery, and well-being (LaVela and Gallan, 2014). Improvement of the physical

environment can create healing environment which considered as smart investment. This will lead to financial saving, improved staff efficiency, and reduce the patient's length of stay. A healing environment can be defined as a place within the physical environment of care where the interaction between patient and staff produces positive health outcomes such as no errors, safety, and security (Huisman *et al.*, 2012). The condition of hospitals will become less stressful after the improvement of physical EoC which eventually resulting on patient's speed recovery and improving the well-being of the patient for their families, as well as creating a comfortable, pleasant, and safe work environment for staff.

There are three main patient safety areas which markedly influenced by the environment, include: Hospital Associated Infection (HAI), medication safety, and falls (Joseph *et al.*, 2012).

i) Hospital Associated Infection (HAI)

At any given of time, 1.4 million people worldwide suffer from HAI with at least 50% of HAI is preventable (World Health Organization (WHO), 2015). Furthermore, HAIs complicate between 5% and 10% of admissions in acute care hospitals in developed countries. However, the risk of acquiring HAI is 2–20 times higher in developing countries including South East Asia countries. The Environment of Care (EoC) is related to the transmission of Hospital Acquired Infections as most HAIs are transmitted through air, water, and contact with contaminated surfaces (White and Griffith, 2010). These include multiple occupancy rooms, ventilation systems, units with difficult surfaces to clean, limited or poorly sited access points to basins, sanitizer points, etc.

ii) Patient Falls

Another component of patient safety is patient fall. The physical environment has great impact on patient fall. The placement of doorways, handrails and toilets, flooring type, and the design and location of hazards like furniture are among the physical environment conditions that can contribute to patient falls and associated injuries (Joseph *et al.*, 2012).

iii) Medication Safety

The condition of physical environmental in areas where medication-related activities occur is frequently influenced the medication safety. The physical environment that has relation to medication safety are light levels, noise levels, space occupancy to minimize interruptions and distractions, and organization of space (White and Griffith, 2010).

1.2.3 Assessment of EoC

There are multitude of ways in the assessment of environment of care. It can be assessed by two types of assessments: objective (expert or technical) or subjective (patient self-reported) (Fornara *et al.*, 2010). The subjective assessment is used to assess the subjective quality of certain aspect in quality system such as perception level and satisfaction level towards the services. Meanwhile, the objective assessment is used to evaluate the actual performance which is objective quality of the system such as the physical environment and compliance to certain standard.

The subjective assessment is referring to perceived measures which generally obtained from usage of questionnaire or interviews. This assessment relies on individual experiences such as perceptions or observations of the environmental quality. The studies showed that perception of the physical environment and social environment are often correlated (Andrade *et al.*, 2013; Fornara *et al.*, 2010).

The objective assessment involved the physical hard measures (i.e., utilizing measurement instruments or quantifiable indicators) or expert judgments (i.e., evaluations based on a specific professional background and used of audit checklist or systematic observation). The systematic observation can be considered as objective assessment as it measures objectively and unobtrusively quantify the built environmental attributes (Rashid, 2007). Some organizations use checklists to assess the magnitude of EoC on the facility as the objective assessment (Institute for Patient- and Family-Centered Care, 2017). The usage of checklists helps in research purposes, quality improvement efforts, and improve care delivery (Rosen and Pronovost, 2014). The experts with related knowledge and training are required in assessing the quality of specific attributes since the measuring instrument that providing a numerical quantification was not used in this type of assessment.

1.2.3.1 Correlation between objective and subjective measurement.

Subjective assessment has some linkage with objective assessment of quality of services. There were mixed findings on the correlation between subjective assessment which is the patients' perception and objective assessment of physical EoC due to characteristics of the environmental features studied (Wisniewski *et al.*, 2018).

The study done by Wisniewski *et al.* (2018) showed there was a significant correlation between patients' perception and objective level of quality in the environment of care. On the contrary, study done by Anhang Price *et al.* (2014) showed there was no significant correlation between both measures. The contradictory findings from these studies can be explained from the patients' pre-existing attitudes and experience which leads to the difference in perceptions of quality and objective measures (Wisniewski *et al.*, 2018).

Two theories involved in examining the relationship between subjective and objective measures: 1) "needs theory" and 2) "comparison theory" (Hagerty, 1999; Liao *et al.*, 2009). "Needs theory" asserts that subjective quality of life indicators depends on objective indicators of living conditions (Diener and Lucas, 2000). For example, according to Schyns (1998), the economic conditions have an important role in the people happiness or subjective life satisfaction. Meanwhile, in "comparison theory", the comparison between standards and values with other alternatives and past experiences have indirectly associated with peoples' subjective satisfaction level. According to Andrade *et al.* (2013), the objective environment quality affects satisfaction through the perception of environment quality

1.3 Patient Related Measure

The patient related measure is one of the important outcomes of healthcare quality and it is measure through the feedback of the patient. Measuring patient related measure is a challenging process due to complex and ambiguous concept that lacks a common or ubiquitous definition. There are multiple cross-cutting terms such as perceptions,

experience and satisfaction in healthcare system that make a conceptual distinction and measurement difficult (LaVela and Gallan, 2014). However, all these concepts and terminology have a similar aim which is to improve patient experiences. Later will help the healthcare organization in improving overall care delivery. Following Donabedian (1988), patient satisfaction can be defined as a patient-reported outcome measure, while the structures and processes of care can be measured by reported patient perception on the experiences (Bjertnaes *et al.*, 2011). Relevant and related questions about patients' healthcare experiences need to be asked in obtaining the association between structure, process, and outcome.

Evaluating patient experience is crucial for healthcare organizations in the assessment of the effectiveness of their current processes, and the responsiveness and respectful of the healthcare providers in managing patients' needs and preferences (Bleich *et al.*, 2009). Through surveys, patients able to express their opinion and provide feedback about the healthcare services during their hospitalization, and this will provide the opportunity for the improvement of the healthcare system to carry out better quality services (LaVela and Gallan, 2014). Even though a study on patient satisfaction was already established in the 1950s, the study kept continuing till today due to the importance of this study and determining the predictor.

The Beryl Institute defines patient experience as the sum of all interactions, shaped by an organization's culture, that influence patient perceptions, across the continuum of care (Jason A. Wolf *et al.*, 2014). Patients' experience is influenced by patients' interaction with the healthcare services received during their hospital stay. It is commonly used to measure their perceptions on the quality of care during their hospitalization (Kemp *et al.*, 2015b). Positive perception on experience increased patient satisfaction level, and vice versa. Furthermore, positive perception is associated

with higher levels of adherence to care management, better clinical outcomes and patient safety within hospitals, and reduce healthcare utilization (Anhang Price *et al.*, 2014).

Patient satisfaction is defined as pleasure or displeasure feeling regarding service offered by healthcare as compared to their expectation (Kotler, 2003) which means the gap between patient expectations and experiences. Satisfaction also can be defined as consumers' emotional feelings about a specific consumption experience (Mano and Oliver, 1993). The satisfaction level also reflected subsequent health-related behaviour. Low satisfaction level can result in poor compliance which leads to waste of resources and suboptimal clinical outcomes.

The most common and widely used method to assess the patients' experience and satisfaction of healthcare system is by using surveys. Majority of healthcare organizations use patients' experience and satisfaction survey - among other indicators – for an assessment of the quality of the healthcare services. There are many measurement approaches and tool that can be used to obtain meaningful insight from the patient. Measuring satisfaction level can be done either by single questions on overall satisfaction or can be formulated from a multi-item scale (Bjertnaes *et al.*, 2011). Patient perception on the experience can be assess using tools such as the Patient Experience Questionnaire (PEQ) (Bjertnaes *et al.*, 2011) and Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) (Elliott, 2009). Meanwhile, the satisfaction level is commonly assessed using Service Quality (SERVQUAL) questionnaire. The selection of the right instrument is depending on the nature of health care system, the purpose of the study and study setting. Certain criteria need to be considered in the instrument selection are, 1) validated and reliable instruments, 2) High utility instruments in real-world practice (Beattie *et al.*, 2015).

1.3.1 Tool for assessment of patient related measure

There are few of instruments that commonly use for the patient experience and satisfaction survey:

1) Patient Experience Questionnaire (PEQ)

The PEQ was developed in 1996 and used as national study in Norway for quality improvement and national surveillance on hospital quality. This questionnaire is a self-report instrument administered by postal after discharge from ward and involved patients discharged from surgical wards and wards of internal medicine (Bjertnaes *et al.*, 2011). The questionnaire consists of 10 scales which comprised of doctor and nurse services, communication, information examination, contact with next of kin, hospital and equipment, medication information, organization, information about complaint and general satisfaction. All of the experience items used a five-point response format ranging from 'not at all' to 'to a very large extent'. The PEQ is a valid tool with the factor loading > 0.4 . Internal consistency was acceptable, with a Cronbach alpha coefficient of >0.70 (Pettersen *et al.*, 2004). The main disadvantage of this questionnaire is it was not used or tested for maternity care ward. Besides that, this questionnaire is a standardized instrument in only one country which is Norway and no other country or healthcare system used it as standardize tool to measure their healthcare system.

2) Picker Patient Experience Questionnaire (PPE Questionnaire)

The Picker Institute Europe developed an instrument to measure the quality of care known as Picker Patient Experience Questionnaire. Theory on patient centred-care which consists of 1) respect for patients' values, preferences and expressed needs, 2) coordination and integration of care, 3) information, communication and education, 4) physical comfort, 5) emotional support and alleviation of fear and anxiety, 6) involvement of family and friends, and 7) transition and continuity were used in the development of PPE questionnaire (Edwards *et al.*, 2015). The PPE questionnaire was mailed to patients' home within one (1) month after discharge. The original PPE contained 40 standard questions from a total set of 100 questions, with the exact number of questions depending on end user. The dimension assessed in the questionnaire are information and education, coordination of care, physical comfort, emotional support, respect for patient preferences, involvement of family and friend, continuity and transition, and overall impression. A concise PPE questionnaire was formed based on the original PPE known as PPE-15, with 15 questions used. The PPE-15 was developed and validated using data from five countries and reported to have high degree of face validity and construct validity together with internal reliability consistency (Jenkinson *et al.*, 2002). The main disadvantage of this questionnaire is it was not used as a standardized instrument for national level or certain healthcare system in the assessment of quality of healthcare system.

3) Patient Satisfaction Questionnaire (PSQ)

The Patient Satisfaction Questionnaire (PSQ) was originally developed by Willis H. Ware and his colleagues in 1976. The questionnaire comprised of 80 items. A more recent version of the questionnaire is the PSQ-III that consists of 50-item under six aspects of care: technical quality, interpersonal manner, communication, financial aspects of care, time spent with doctor, and accessibility of care. Other type of PSQ is PSQ-18 which is the concised form of PSQ. It retained many characteristics of original PSQ (Marshall and Hays, 1994). The PSQ-18 is appropriate for use in limited time situation which precludes administration of the full-length PSQ-III. The PSQ-18 takes approximately 3-4 minutes to complete. This questionnaire is commonly used in localize and specific healthcare setting for their quality assessment process and not used as standardized instrument at a national level or certain healthcare system. This limits the comparability to quality standard of the national healthcare system.

1.3.2 Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS)

Despite various instruments available in assessing the patient perception on hospital experience, Hospital Consumer Assessment of Healthcare Providers and Systems (HCAHPS) was chosen. The HCAHPS is frequently and widely used to assess patient perceptions on EoC experience during patients' hospitalization (LaVela *et al.*, 2016).

HCAHPS was developed by the Centers for Medicare & Medicaid Services together with Agency for Healthcare Research and Quality in 2006 as a standardized instrument to assess the quality of healthcare nationally in USA (Elliott, 2009). The HCAHPS formed as a subset to Hospital Quality Initiative Hospital in collaboration with Hospital Quality Alliance (HQA), a public-private collaboration on hospital management. Hospitals registered under Medicare and Medicaid in USA are federally mandated to participate in HCAHPS survey.

Several acts were enacted in the enforcement of HCAHPS survey. First, the Deficit Reduction Act of 2005 was introduced to create additional incentive for acute care hospitals to participate in HCAHPS. Second, in July 2007, hospitals were subjected to the Inpatient Prospective Payment System (IPPS) whereby hospital must collect and submit HCAHPS data for them to receive full IPPS annual payment update. IPPS hospitals that fail to publicly report the required quality measures, including HCAHPS survey, may receive a reduced annual payment update. Third, the Patient Protection and Affordable Care Act of 2010 was introduced to include HCAHPS among the measures in the calculation of value-based incentive payments in the Hospital Value-Based Purchasing program. HCAHPS is the basis for the Patient and Community Engagement (PCE) domain, which accounts for 25% of a hospital's Hospital VBP Total Performance Score (TPS) (HCAHPS: Patients' Perspectives of Care Survey 2020). Poor performance on the HCAHPS result in financial penalties to poor-performing hospitals.

Besides that, the finding from HCAHPS survey is used to rank the hospital from a rank of 1 (the lowest) to 5 (the highest). The ranking is openly available online in the Hospital Compare website. This public reporting creates the motivation for hospitals to improve quality of care. Other than that, the public reporting enhance

accountability in health care by increasing transparency of the quality of hospital care. About 1 in 6 Americans consulted online rankings in choosing hospital for the services (Fox and Duggan, 2013). The public reporting of HCAHPS findings are intended only for the quality improvement purposes which support the customer choice, and not for marketing or promotional activities.

In USA, the healthcare system is dominantly financed by private health insurance. In 2017, the USA population of 325 million spending reached \$3.5 trillion, and such costs now consume approximately 18% of the gross domestic product (GDP). About 33% of health spending was for hospitals care followed by physician and clinical services (approximately 20%) and prescription drugs including retail ambulatory, and hospital costs (approximately 18%) (Maddox *et al.*, 2019).

The private health insurance covered approximately 197 million individuals accounted for \$1.2 trillion in healthcare spending. Meanwhile, public health insurance, Medicare covered approximately 57 million individuals and accounted for approximately \$706 billion in expenditures. Medicaid covered approximately 72 million individuals and accounted for approximately \$582 billion in health care spending. However, about nearly 14% of US residents are uninsured, and these numbers are markedly higher among people living in poverty, and racial and ethnic minority populations. Medicare is the public health insurance that obtain government assistance mainly covered for core populations of individuals aged 65 years or older and individuals younger than 65 years with certain morbidity such as end-stage renal disease, amyotrophic lateral sclerosis, or disabilities. Meanwhile, Medicaid covered for children, pregnant women, and adults living in poverty or with disabilities (Maddox *et al.*, 2019). The Medicare and Medicaid use the Managed Care Organization (MCO) as an intermediary between hospital provider and patient.

In USA, hospital is an institution primarily engaged in providing in-patient diagnostic and therapeutic services or rehabilitation services by or under the supervision of physicians. American Hospital Association data shows a total of 6090 hospitals in the United States as of 2020 which are divided into three major types, Community hospital, Non-federal psychiatric hospital, Federal hospital, and others (American Hospital Association, 2021). The majority of hospitals in USA are community hospital which categorize into private non-profit (57%), private-own for profit (24%), and public non-profit by state and local government (19%). About 67% of community hospital are system-affiliated and 33% are independent. Two-thirds of community hospital are located in large cities. Teaching hospitals are also considered as community hospital. The Federal Hospital account about 200 hospitals operated by the federal government of USA that cater for specific patient populations, such as active military personnel.

About 4000 hospitals with certified Medicare and Medicaid hospital participate in HCAHPS survey. HCAHPS is designed for acute-care hospitals with specialty hospitals (e.g., pediatric, psychiatric) are excluded. Any hospital that is reimbursed under the Inpatient Prospective Payment System (IPPS) and is eligible for the Annual Payment Update have to participate in HCAHPS in order to receive full reimbursement updates. However, non-IPPS hospitals, such as Critical Access Hospitals, can voluntarily participate in HCAHPS however the finding is not publicly reported.

HCAHPS is a core set of questions that can be combined with a broader, customized set of hospital-specific items (Centers for Medicare & Medicaid Services, 2021). The finding from HCAHPS survey is used with other quality and clinical indicator for monitoring quality of healthcare services, compare the overall performance of the hospitals, incentivize healthcare providers and performance-based

payment. The HCAHPS assesses the patients' perception of EoC mainly on the social environment such as communication with the nurse and doctor, and physical environments such as the cleanliness of the hospital environment and quietness of the environment (LaVela et al., 2016). Through this survey, hospitals are therefore strongly motivated to improve patient satisfaction scores which can reflect high quality of care, attract and retained patients, as well as secured hospital revenue by maximizing the reimbursements and avoiding penalties.

HCAHPS was selected for the European Commission RN4CAST project, which involved 12 countries (Belgium, England, Finland, Germany, Greece, Ireland, The Netherlands, Norway, Poland, Spain, Sweden, and Switzerland). The reason being that it yielded comparable results that would allow for objective and meaningful comparisons across health systems on domains that are important to consumers among the participating European countries and the USA (Squires *et al.*, 2012). Other countries such as Qatar, Thailand and Indonesia also use HCAHPS survey to measure their healthcare quality due to its well-known comparability and benchmarking outcome. In Qatar, HCAHPS survey was chosen as an instrument to assess patient experience in Health Services Performance Agreements Program (HSPAs) under National Health Strategy (NHS 2011-2016) projects (Awad, 2020). Certain hospital organization in Thailand use HCAHPS as a standardized tool to measure patient perception and satisfaction level annually as one of their quality programmes (Bangkok Dusit Medical Services, 2019; Bangkok Hospital Phuket, 2020). Meanwhile a few studies done in Indonesia used HCAHPS as a tool to measure patients' perception and satisfaction level (Layuk, 2019; Musdalifah, 2016; Pasinringi *et al.*, 2015)

1.4 HCAHPS survey

The HCAHPS survey was first conducted for hospital in USA nationally from July 2006 through June 2007 and the finding became publicly available in March 2008 (Jha *et al.*, 2008). HCAHPS is administered to a random sample of adult in-patients from medical, surgical and maternity care service lines between 48 hours and six weeks after discharged (Centers for Medicare & Medicaid Services, 2019). In USA, hospitals may use an approved survey vendor or collect by their own if approved by CMS for HCAHPS data. HCAHPS can be administered in four survey modes: mail only, telephone only, mixed (mail with telephone follow-up), or active Interactive Voice Response (IVR). For the official use of HCAHPS in USA, the HCAHPS finding is adjusted using case-mix and mode of administration for a valid comparison between hospital in public reporting (Centers for Medicare & Medicaid Services, 2021). Mode adjustment is done to overcome the response differences due to social desirability effect from various mode of HCAHPS survey (Kemp *et al.*, 2015b).

The paper by Jha *et al.* (2008) was the first published paper on the HCAHPS survey finding study during the period from July 2006 through June 2007. The HCAHPS survey involved public non-profit hospital, private non-profit and for-profit hospital. Teaching hospital was also involved in this survey. The public non-profit hospital has the highest proportion of positive experience in all patients' experience domain (55.2% - 80.9%) as compared to private for-profit and private non-profit private. This finding violated the hypothesis in which private for-profit have the highest positive experience and satisfaction level as compared to others. The reason might be due to the difference in population's socio demographic characteristic for each type of hospital. When comparing non-teaching hospital and teaching hospital,

there was significant difference in the proportion of positive patient perception in HCAHPS domains. The proportion of positive patient perception for teaching hospitals was less compared to the non-teaching hospital (Jha *et al.*, 2008).

As overall, about 60-80% of the patients has a positive experience in all the patient experience domain. The domain on communication with doctor and domain on discharge plan were the domains that have the highest proportion of positive patient experience. Meanwhile, the domain on the physical environment that consists of the quietness of the environment and cleanliness of the environment was the domain that has the lowest proportion of positive experience. The latest HCAHPS survey in the US showed almost similar findings to that of the first survey, where the proportion for the positive experience was approximately 60-80% (Vink *et al.*, 2019).

For the satisfaction level, a public non-profit hospital had the highest satisfaction level (65.4%) as compared to private non-for-profit (64.8%) and for-profit hospital (59.1%) (Jha *et al.*, 2008). Meanwhile, a teaching hospital had higher satisfaction level (63.3%) as compared to non-teaching hospital (62.8%). As overall, about 63.6 % of patients were satisfied with the hospital in the USA (Jha *et al.*, 2008). The patient satisfaction level in the USA has been increasing for the past 10 years, from about 71% of patient satisfied in 2014 survey (*HCAHPS Performance of Maryland Hospital 2015*) to 82% in 2018 survey (Vink *et al.*, 2019).

A study using HCAHPS was conducted in Canada that used publicly funded universal healthcare system from 2011 to 2014. This study used computer-assisted telephone interview (CATI) involving 27 492 patients (78% response rate) from 94 hospitals (Kemp *et al.*, 2015b). This study revealed the proportion of top box that indicates positive experience on nurse and doctor were 66.1% and 73.7% respectively.

This study modified the rating scale from the original HCAHPS that use four (4) rating scale into 11 rating scales with retainment of the top box categorization in the original HCAHPS. For the satisfaction level, about 61.9% of the patients were satisfied with hospital services in Canada measured using original HCAHPS rating scale.

Another study done using HCAHPS was conducted in 2011 involving 42 out of 131 public hospital nationwide in Greece with 5467 patients participated in the survey (Mitropoulos *et al.*, 2018). This self-administered survey was conducted at the time of patient discharge. In this study, the satisfaction level was 8.07, determined by using the mean of overall rating from HCAHPS survey.

The HCAHPS survey finding in Qatar from 2017-2019 reported the average score for communication with doctors (92.1%), communication with nurses (91.8%), responsiveness of staff (87.7%), pain management (87.4%), cleanliness of hospital environment (87.0%), communication about medication (84.4%), quietness of hospital environment (83.4%), and discharge information (74.2%) (Awad, 2020). A 2015 study done in hospitals in District Bantaeng, Indonesia showed the proportion of positive experience ranged from 71% for cleanliness of hospital environment to 97% for pain management domain (Musdalifah, 2016). While, another study in Indonesia showed proportion of positive experience ranged from 83.2% for pain management to 88.4% for nurse communication (Layuk, 2019).

The finding from RN4CAST project done in 2012 showed patient satisfaction level varied from 35% in Spain to 61% in Finland and Ireland (Aiken *et al.*, 2012). In a study done in 63 hospitals in Norway, about 88.1 % of patients were satisfied with overall satisfaction (Bjertnaes *et al.*, 2011). In Qatar, the national average for overall hospital rating from 2017 to 2019 was 88.9% (Awad, 2020). In Thailand, patient

satisfaction level for hospitals within Bangkok Dusit Medical Services network, in year 2016-2018 reported an increment from 77% to 87% based on their HCAHPS survey (Bangkok Dusit Medical Services, 2019). The patient satisfaction level in Bangkok Hospital Phuket also increased from 70.8% in 2017 to 76.4% in 2018 using similar survey (Bangkok Hospital Phuket, 2020). While in Indonesia, the patient satisfaction level was 91% using HCAHPS survey (Layuk, 2019).

In Malaysia, the study on patient satisfaction was established for the public hospital using a different instrument. A study done in 25 public hospitals in 2011 by the Ministry of Health Malaysia found around 95.1% of patients were satisfied with the service based on assessment from a single question on overall satisfaction (Mohd Idris O, 2012). Study done by Noor Hazilah (2012) involved in-patient in public general hospital reported the satisfaction score was 3.98 out of 5 score using specific localized questionnaire. On the other hand, a patient satisfaction study done in Malaysia National Health Centre showed 93.5% of patients rated their satisfaction as excellent and very good (National Heart Centre, 2016). A study done in 2009, assessing the patient satisfaction level with nursing care among in-patient from Orthopedic ward in Hospital USM reported 82.7% patients were satisfied with nursing care (Shirley Teng and Norazliah, 2012).

A study done for an outpatient in one hospital in Selangor using PSQ 18 reported the satisfaction level was 59.2% (Ganasegeran *et al.*, 2015). A patient satisfaction study done in a teaching hospital in Malaysia in 2011 that involved outpatient using PSQ-46 reported 93.1% patients were satisfied with overall service of its primary care clinic, with the highest satisfaction level was on the doctor services (96.5%) and the lowest was the physical facility (35.6%) (Hizlinda *et al.*, 2012). A

study done in 2015 revealed 78.5% patients satisfied with Hospital USM dental clinic (Nadeerah *et al.*, 2016)

1.5 Factors associated with patient satisfaction

Patient satisfaction is based on a subjective evaluation that is influenced by past experiences, patient expectations, and socio-demographic variables (Bjertnaes *et al.*, 2011). Patients' perceptions also were identified as the most important determinants of patient satisfaction level in comparison to demographics and physical environment (Schoenfelder *et al.*, 2011). Various factors contribute to positive and negative patient experiences such as clinical outcomes, experience with healthcare teams, and the environment in which healthcare is received (LaVela *et al.*, 2016).

A few studies were conducted to determine factor associated with satisfaction level using HCAHPS. Study by Kemp *et al.* (2015b) used overall rating score as satisfaction level and became an outcome variable that was dichotomized into two groups: top box which rating of 9-10 (high satisfaction level) versus lower box which rating 0–8 (lower satisfaction level). The study by Mitropoulos *et al.* (2018) done in Greece used mean or average score of overall rating from HCAHPS as outcome variable in analysis.

1.5.1.1 Patient experience

By using the “people, process, place” model, various complex variables that affect the patient experience can be examined (Kenny and Martin, 2016). This model help in guiding hospital leaders to identify patient-centred ways in improving the patient experience through establishing a caring culture; implementing process improvements, such as processes that support patients and staff; and making improvements to the place of care, including the hospital physical environment, and technology.

There is a strong association between global satisfaction ratings with patient experience (Bleich et al., 2009). Furthermore, in the literature, a lot of studies have established the relationship between the perceived quality of hospital services and patient satisfaction (Azizan and Mohamed, 2013). There are two most common components of in-patient experience factor:

i) Experience with the nurses and doctor service

The earliest study that used HCAHPS revealed that staff communication from both nurses and doctors were the most important predictor for patient satisfaction (Elliott *et al.*, 2007). Study done in Canada showed there was a correlation between communication with the nurses and communication with doctor, and satisfaction level (Kemp *et al.*, 2015a; Kemp *et al.*, 2015b). Other study that used HCAHPS involved 42 hospitals in Greece found communication with nurses was the most important predictor of overall satisfaction, followed by communication with doctors after analysing using ordinal regression analysis (Mitropoulos *et al.*, 2018).

Other studies also show a similar finding in which experience with nurse and doctor is the most important predictor for patient satisfaction (Kemp *et al.*, 2015b; Okuda *et al.*, 2014). In Qatar, communication with nurses and doctors also become the most significant factor associated with the overall hospital rating (Awad, 2020). Study done in 39 Hospitals in Germany, the experience with nurses and doctor service was the most determinant in satisfaction level (Schoenfelder *et al.*, 2011). In Malaysia, a study done by Azizan and Mohamed (2013), showed nursing care and medical care were the most influential factor of perceived service quality.

The communication with nurses and nursing care is perceived as more important to patients as compared to doctor communication (Elliott, 2009). The possible reasons being a patient has more contact with nurses than doctors as nurses are the first responders to patients and nursing care is more frequent (Schoenfelder *et al.*, 2011). This finding highlighted and emphasized the importance of communication between patients and hospital staff that determined the patients' experience level.

ii) Physical Environment of Care (LaVela *et al.*, 2016)

Physical environment is another emerging factor need to be considered in optimizing the patients' experience and the overall patient-centeredness of healthcare setting (LaVela *et al.*, 2016). The patient perception on the physical environment is used by healthcare organization to create environment of care that serve to treat the patient with less stressful condition and providing comfort to both patients and their families. Cleanliness of the environment and quietness of the environment are the most common proxy for physical environment quality used in healthcare research (Kenny and Martin, 2016). Other elements such as architecture, interior design, building systems, building

materials, furniture placement, art, lighting, and maintenance programs were commonly studied by the technical team such as in architecture research.

The cleanliness of the environment is considered as an important issue especially as a primary measure for infection control, as well as, an indicator of the hospital management commitment as a whole (Sofaer and Firminger, 2005). Patients' perception of cleanliness can be improved with decor choices, lighting, and furniture selection. Meanwhile, quietness of the environment of care is also an important factor related directly to the in-patient's needs to rest or sleep. Hospital noise is a major cause of sleep disturbance and loss of sleep for patients (Kenny and Martin, 2016) which interfere the healing process of patient and also can disrupt patient experience. Study by Kemp *et al.* (2015a) showed that the physical environment domain in HCAHPS which consist cleanliness and quietness of environment have significant correlation with the satisfaction level. The physical environment emerged as the next most important factor concerning patients' satisfaction (Mitropoulos *et al.*, 2018). A study done by Okuda *et al.* (2014), showed in the biggest hospital, the physical environment becomes among the factor associated with satisfaction level.

Physical environment with positive distractions, such as views of art and nature also influenced patient's pain management of patient. Other component of physical environment such as layout of hospital unit may influence staff responsiveness and communication scores can improve when the hospitals provide quiet area for staff to discuss issues with patients.