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# Patient Measure Of Safety (PMOS) For Measuring Patient Perception Of Safety In Hospital: Systematic Review

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**Abstrak**

Kompleksitas sistem layanan kesehatan dan meningkatnya bahaya pada pasien di fasilitas layanan kesehatan menjadikan keselamatan pasien sebagai prioritas utama di pelayanan kesehatan. Pasien sebagai pengamat utama pada layanan mereka, namun tidak banyak keterlibatan pasien untuk memperbaiki keselamatan pasien di rumah sakit. Patient Measure of Safety (PMOS) merupakan alat untuk mengkaji faktor yang memiliki kontribusi terhadap keselamatan pasien. Tujuan dari systemic review ini adalah untuk mengkaji kelayakan PMOS untuk mengidentifikasi faktor yang berkontribusi pada keselamatan di rumah sakit. Pencarian literatur secara online dilakukan pada Pubmed, Proquest dan Google Scholar berdasarkan guideline PRISMA dan menghasilkan 502 artikel. Artikel yang tidak berhubungan berdasarkan kriteria eksklusi dikeluargakan dan berdasarkan teks penuh, 5 artikel dipilih untuk systemic review ini. Berdasarkan artikel yang telah dipilih, PMOS mampu menemukan kelemahan laten pada pelayanan kesehatan, identifikasi faktor yang berkontribusi terhadap keselamatan berdasarkan persepsi pasien, seperti keterlambatan atau komunikasi dan Kerjasama yang tidak baik. Sebagai bagian dari pengukur terhadap sebuah intervensi, PMOS dapat mendeteksi permasalahan yang biasanya terlewatkan di manajemen rumah sakit. Oleh karena itu, keunikan umpan balik dari persepsi pasien mampu didapatkan melalui PMOS, sebagai alat yang layak, valid dan dapat diandalkan untuk mengukur faktor keselamatan melalui persepsi pasien. Kombinasi PMOS dengan alat keselamatan dan perbaikan berkelanjutan mampu menjaga dan memperbaiki keselamatan dari pelayanan kesehatan.

**Kata Kunci:** *Patient Measure Of Safety, Keselamatan Pasien, Rumah Sakit.*

**Abstract**

The complexity of healthcare system and the rise in patient harm in healthcare facility has resulted in patient safety as the main priority in health care. Patients are the acute observer of their care and yet, there is lack in patient involvement in improving patient safety in hospital. Patient Measure of Safety (PMOS) is a tool to assess factors that has contribution to the safety of their care. The objective of this systemic review is to assess the feasibility of PMOS to identify factors that contribute to safety in the hospital setting. Online database literature search were conducted in Pubmed, Proquest and Google Scholar based on PRISMA guideline, resulting in 502 articles. Irrelevant articles based on exclusion criteria were removed and then based on the full text, 5 articles were chosen for this systemic review. Based on the compiled articles, PMOS were able to catch latent weaknesses in health care, identifying factors that contributes to safety based on patient perception, such as delay or bad communication and team work. As a part of measuring of safety intervention, PMOS able to detect problems that usually missed in the hospital management. Therefore, the uniqueness of patient feedback could be captured through PMOS, as feasible, valid and reliable tool to measure safety factors through patient perception. Combining PMOS with other safety tools and continuous improvement might help hospital to maintain and improve the safety of the care.

**Keywords :** *Patient Measure Of Safety, Patient Safety, Hospital.*

## INTRODUCTION

The complexity of healthcare system and the rise in patient harm in healthcare facilities has resulted in patient safety as the main priority in health care. World Health Organization (WHO) pointed out that approximately, one in every ten patients is harmed during receiving health care in hospital located in high income countries and 50% of them could be preventable.(1,2) In low and middle income countries, the number is quite concerning as well, in which each year, unsafe care resulted in 134 million adverse events and ended as death in 2.6 million patients.(3) Patient safety incidents could resulted in severe burden to surviving patients and families, physically and emotionally. WHO has estimated that the social cost of patient harm to be around US$ 1 trillion to 2 trillion in a year.(4)

WHO in their recent Global Patient Safety Action Plan 2021-2030, has stated current guiding principles to work towards eliminating avoidable harm in health care, which is one of them is engaging patients and families as partners in safe health care. (4) Patients could make essential contributions as they are the acute observant of their health care experience. (5) Full involvement of patients, families and caregivers should be existed at every level of health care, including policy making, planning, performance oversight, informed consent and shared decision making at health care facilities.(4) However, there is still lack in patient involvement for patient safety as not much attention were given for patients' perspective and experience in primary care research.(5) Majority of all patient safety incidents are reported by healthcare staff and incidents that reported by patients are deemed as dramatic as feelings and emotions of patients and families could influence the way the incident conveyed.(6)

The difference between how healthcare staffs and patients perceived the healthcare is a challenge; however, researchers has been developing objective approach to capture patient feedback towards healthcare they received. Patients are expected to be able to give feedback regarding causal factors that contributing to safety in health care, such as teamwork, physical environment, availability of equipment and supplies, workload and lines of responsibility, that present in ward or unit they were visiting and have questions directed for each factors.(7) This approach is focusing on latent contribution factors to safety in healthcare and steps ahead compared to traditionally acquired questioner that usually given to patients regarding their healthcare experience and satisfaction.(8)

To measure patient experience of care in hospital setting, Giles et al used Yorkshire Contributory Factors Framework (YCFF) that consisted of factors such as physical environment, communication, leadership and teamwork. This research has resulted in a tool that able to analyze factors has contribution to the safety of their health care and called as Patient Measure of Safety (PMOS). (9) Since this tool is newly developed in 2013, there is not many research that has used this tool to measure patient perception towards safety in their care at a hospital setting. Further research regarding the feasibility of PMOS in hospital settings is still needed to provide patient perspective and more importantly to improve patient safety in healthcare and especially in hospital settings. Therefore, we conducted a systematic review to assess the feasibility of PMOS to identify factors that contribute to safety in the hospital setting.

## METHOD

This article is a systematic review that conducted using Preferred Reporting Items for Systematic Reviews and Meta Analysis (PRISMA) instrument and flow chart to guide article search and compile the findings using PRISMA 2020 checklist. SPICE framework (Setting, Perspective, Intervention, Comparison and Evaluation) used to decide question of this research, key words, inclusion and exclusion criteria, and guide the database search strategy (Table 1)(10,11). Articles searched from online database such as Pubmed, Proquest and Google Scholar using several keywords, such as Patient Measure of Safety, PMOS, patient safety, patient perception and hospital with Boolean (OR and AND).

**Table 1. SPICE Framework**

| Focus | Concept | Question |
|---|---|---|
| Setting | Place or setting the intervention will occur | In hospital, |
| Perspective | Population affected by the intervention | how can patients |
| Intervention | The planned action or service | perceive patient safety measured by PMOS |
| Comparison | Alternate service or action | No measurement |
| Evaluation | Result; The measure of effect | Identify factors that contribute safety |

Articles that appeared on search engine are filtered using inclusion and exclusion criteria. The inclusion criteria were relevant articles that conducted research regarding patient safety in hospital setting using PMOS in the last five years (2017-2022). Exclusion criteria were articles that conducted research that not in hospital setting, research that not using patient perception and PMOS in measuring patient safety factors in healthcare, incomplete articles, not in English, abstract only, unavailable, textbook chapters and learning materials.

During data selection and extraction, articles will be screened through title and abstract to find relevant studies. Duplicate articles will be filtered out. Full text of relevant studies will be read. Criteria inclusion and exclusion used to judge against each article are relevant or appropriate for research. Studies that meet inclusion criteria will be assessed with CASP Checklist Tools for study quality assessment. CASP Checklist Tools is critical appraisal tools that is consisted of ten questions.(12)

## RESULTS AND DISCUSSION

During the search in three databases (Pubmed, Proquest and Google Scholar), we found total 635 articles. Duplicate articles were removed, resulting in 502 articles. Then, irrelevant articles based on titles were removed, resulting in 43 articles. These articles are judged based on abstract, and resulted in 22 articles. We judged the articles based on the full text, whether the aim and result are relevant to our systemic review. Finally, 5 articles were chosen for this systemic review. The process of study selection can be seen in Figure 1.

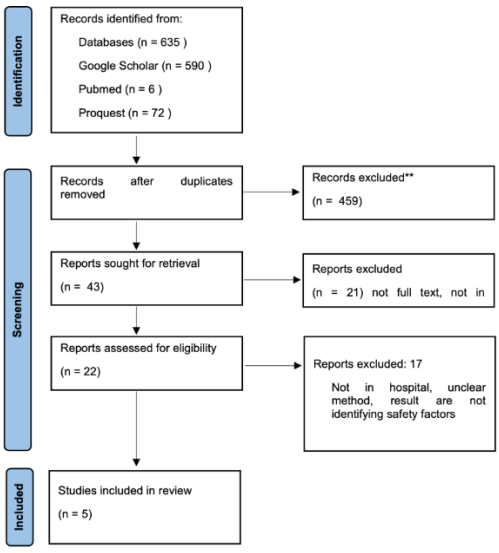


**Figure 1: Study selection flowchart based on PRISMA**

**Table 2: Study characteristics**

| Author | Title | Setting | Aim | Methods | Results |
|---|---|---|---|---|---|
| Lawton et al, 2017 | Can patient involvement improve patient safety? A cluster randomised control trial of the Patient Reporting and Action for a Safe Environment (PRASE) intervention | 33 wards from 5 hospitals in UK | Evaluate the efficacy of PRASE intervention in hospital wards | Multicenter cluster randomised controlled trial | 1. PMOS reliability reported as high at each time point (alpha >0.9)<br>2. Through PMOS, patients were willing and able to provide feedback about safety. However, ward teams had difficulty to develop action for improvement<br>3. Patient reporting and feedback is feasible, acceptable and has potential for reducing patient harm |
| Baxter et al, 2017 | Identifying positively deviant elderly medical wards using routinely collected NHS Safety Thermometer data: an observational study | Elderly wards of hospital in UK | Develops and critically appraises a pragmatic method for identifying positively deviant wards using a routinely collected, broad measure of patient safety | Observational study | 1. PMOS was part of comparation measurement to identify positively deviant wards in a hospital<br>2. Less concordant data was found between PMOS and routinely collected survey. |
| New et al, 2020 | Perceptions of hospital safety for inpatients with chronic | Acute care unit of hospital | Examine safety perceptions of patients with CKD and | Quantitative exploratory study | 1. Through PMOS, it was discovered perceptions of overall safety |

| | | | | | |
|---|---|---|---|---|---|
| | kidney disease: A cross sectional quantitative study | in Canada | ESRD through their assessment of organizational and local factors that have been known to contribute to safety incidents | | are clearly influenced by patient perceived level of safety within physical and interpersonal care environments<br>2. Early improvement care in process could be started by obtaining patient feedback continuously |
| Taylor et al, 2020 | Older, vulnerable patient: a pilot and feasibility study of the patient measure of safety (PMOS) with patients in Australia | 3 wards from one hospital in Australia | Investigate whether the PMOS is appropriate to be used for stroke, AMI and hip fracture patients in Australian hospitals in order to ensure the feasibility of using DUQuA study. | Two phase study; first one think aloud study, second feasibility test of PMOS in DUQuA | 1. PMOS is appropriate tool as it showed its highly significancy for DUQuA study<br>2. Bigger and representative sample will strengthen the validity and reliability of the PMOS |
| Schiavone et al. 2021 | Evaluation of Patients' Perception of Safety in an Italian Hospital Using the PMOS-30 Questionnaire | One general hospital in Italy | Evaluate feasibility of PMOS-30 in Italian hospital and promoting the improvement of health care quality | Cross sectional | 1. The use of PMOS-30 has ability to improve safety and health care quality hospital through patient feedback<br>2. Potential harms were reported in more than half of the reports, and related to ward staffs (incompetence, poor attention, poor communication and poor information to |

patients, delays in health care)

## DISCUSSION

PMOS is the first tool that developed to identify potential safety risk of health care through patient perception in health care setting, especially hospital.(13) The validity and reliability of PMOS has reported as acceptable.(13) There is also a report of psychometric aspect still remained good in Persian version of this questionnaire compared to original English verison.(14) Adaptation so it can be used in different setting such as primary health care is also newly developed.(15) This implies PMOS might be adaptable in different health care facility and different country.

In this review, we have compiled 5 studies that using PMOS as a part of study of identifying safety factors or measuring the impact of intervention for hospital safety improvement in hospital setting. The subject of researches are patients who received care in inpatient unit, ranging from adult patients( 18 years old) to elderly patients, with one study specified the subject age to elderly patients in elderly medical wards. (16) Some of the studies specified the characteristic of patients or wards, such as vulnerable patient (stroke, acute myocardial infarction, and hip fracture) and ward that dealing end stage disease patients (chronic renal failure and end stage of renal failure). (17,18)

PMOS consisted of 8 domains and 44 items of that contributes to safety: (1) Communication and Team Work, (2) Organization and Care Planning, (3) Access to Resources, (4) Ward Type and Layout, (5) Information Flow, (6) Staff Roles and Responsibilities, (7) Staff Training, and (8) Delays(13). First item which is standalone from any domains is Dignity and Respect which is written as question “I always treated with dignity and respect”. Likert scale was used to measure all of the items (1—strongly disagree, 2—disagree, 3—neither disagree or agree, 4---agree, 5—strongly agree). In one of our compiled studies, study by Schiavone et al using shortened version of PMOS, which is called PMOS-30 that consisted of 8 domains and 30 items.(19) PMOS-30 were already tested for reliability and validity as the original version (PMOS-44) to capture patient feedback about safety in hospital.(20)

PMOS main ability was to capture patient feedback to catch latent weaknesses in health care.(9) In Taylor et al study, Staff Training were rated by patient as the most favorably and the least favorably were the Delays.(18)Similar with findings from Schiavone et al’s study, in which they described the patients were able to reported potential harms regarding ward staffs including delays, poor information, communication and attention).(19), New et al reported there are strong association between each domain of safety domains and Respect and Dignity item, in which Respect and Dignity, Staff Training, Staff Roles and overall score has moderate associations and Communication and Teamwork, Organization and Care Planning, Access to Resources, Ward Layout, Information Flow, Equipment Design and Functioning has strong associations.(17) Domain of Delays and Communication and Teamwork was prominently has significant impact in patient’s perceived safety. Delay must be reduced to control patient flow, as patient do not want to experience long time during their health care. To this date, there is a report regarding how bad patient flow that perceived by clinician staff in health care has correlation with the reality.(21) As delay was also part of experience of the patients, the findings from PMOS study could indicated signs of delay based of patient feedback could be taken as important value to evaluate bigger system, such as patient flow.

Meanwhile Communication and Teamwork in PMOS was asked with questions such as how patients and healthcare staffs communicating to how teamwork between staffs occurred. Communication played big part on health care delivery. Patients didn’t only need medical care but also explanation or even moral support and motivation for their illness. It was already stated that patients are acute observer of their care, however, they are also critical enough to doubt and ask actively to healthcare staffs for more information about their illness. Healthcare staff who provided the information also plays important role as patients are more comfortable to nurses since the frequency of engagement comparing to other healthcare staffs.(22) With this

information, board of directors and stakeholders of the hospital can take decisions which part of the care to be improved and what kind of action should be taken.

One interesting study that could gave example how PMOS could play a part in deciding improvement in health care is study by Lawton et al. in They conducted an intervention called Patient Reporting and Action for a Safe Environment (PRASE). (23) PRASE gathered patient feedback through PMOS and Patient Incident Reporting Tool (PIRT). The gathered information would be reported and discussed with multi-disciplinary action planning group. These steps of interventions happened in cycles, providing continuous feedback after patient perception measured again with the same tools, all in three months.(24) PMOS was able objectively comparing perceived safety before and after intervention and able to detect effect size of the intervention. The variables that provided in PMOS and in PIRT, would able to pointed out issues that usually missing in the eye of management. Hospital management might not routinely exposed to patient safety issues as most of management might composed staffs from non-medical background.(25) So the detailed information from patients and cycle improvement would gave solid feedback such as how some wards might need extra attention on noise or some other wards need extra attention in communication.

This pointed out differences between specific wards might requires has different score and required action. As in Baxter et al's study, each ward was measured to decide which one has better positive deviance approach. Positive deviant wards management is emphasizing how non-professional health care staffs participated in ward activity.(26) This activity means management of microsystem in hospital. Positive deviant ward used to get identified by conducted routine staff survey and the surprising is, there is quite difference between the chosen wards by routine staff survey and PMOS. Wards that identified as positive deviant wards scored low in PMOS. This finding explains how unique patient perspective is, however this might only capture safety culture rather than outcome of the routine data.(16) This could also implies different perspective compared to a survey that routinely taken one, as stated in the Baxter et al's study, staff survey are part of their routine survey.

## CONCLUSION

Patient perspective is unique and might showed the gap hospital management usually missed; problems that different each specific wards or health care staffs and microsystems of hospital. This uniqueness of feedback could be captured through PMOS, as feasible, valid and reliable tool to measure safety factors through patient perception. According to our review, domain of Communication and Team work and Delay was the prominent safety factors in the hospital through patient perception. Identifying the factor is one step, as PMOS can be a part of big and continuously intervention just like PRASE cycles intervention in which all of findings will be discussed and solved. Challenges might arise on how the mixed feedbacks to be interpreted and solved but continuous problem solving might leads to appropriate solution to the problem. The limitation in this study is the number of studies reviewed since PMOS is newly emerged tool and the number of research still not widely present. However, we hope the continuous usage of PMOS will widely present in the future as it could play important role in improving patient safety on hospital.

## DAFTAR PUSTAKA

de Vries EN, Ramrattan MA, Smorenburg SM, Gouma DJ, Boermeester MA. The incidence and nature of in-hospital adverse events: a systematic review. Qual Saf Health Care [Internet]. 2008 Jun [cited 2022 May 22];17(3):216–23. Available from: https://pubmed.ncbi.nlm.nih.gov/18519629/

Patient Safety [Internet]. [cited 2022 May 22]. Available from: https://www.who.int/news-room/fact-sheets/detail/patient-safety

Crossing the Global Quality Chasm: Improving Health Care Worldwide. Crossing the Global Quality Chasm [Internet]. 2018 Dec 27 [cited 2022 May 22]; Available from: https://pubmed.ncbi.nlm.nih.gov/30605296/

WHO. Global patient safety action plan 2021–2030: towards eliminating avoidable harm in health care. Geneva; 2021.

Ricci-Cabello I, Pons-Vigués M, Berenguera A, Pujol-Ribera E, Slight SP, Valderas JM. Patients' perceptions and experiences of patient safety in primary care in England. Family Practice [Internet]. 2016;33(5):535–42. Available from: https://academic.oup.com/fampra/article/33/5/535/2197608

Donaldson LJ, Donaldson L. The wisdom of patients and families: ignore it at our peril. Available from: http://www.ichom.org/why-we-do-it/

Lawton R, Armitage G. The role of the patient in clinical safety. London; 2012 May.

Giles SJ, Parveen S, Hernan AL. Validation of the Primary Care Patient Measure of Safety (PC PMOS) questionnaire. BMJ Qual Saf [Internet]. 2019 May 1 [cited 2022 May 6];28(5):389–96. Available from: https://pubmed.ncbi.nlm.nih.gov/30337498/

Giles SJ, Lawton RJ, Din I, McEachan RRC. Developing a patient measure of safety (PMOS). BMJ Quality & Safety [Internet]. 2013 Jul 1 [cited 2022 May 9];22(7):554–62. Available from: https://qualitysafety.bmj.com/content/22/7/554

Phelan S, Lin F, Mitchell M, Chaboyer W. Implementing early mobilisation in the intensive care unit: An integrative review. Int J Nurs Stud [Internet]. 2018 Jan 1 [cited 2022 May 26];77:91–105. Available from: https://pubmed.ncbi.nlm.nih.gov/29073462/

Cleyle S, Booth A. Clear and present questions: Formulating questions for evidence based practice. Library Hi Tech. 2006 Jul 1;24(3):355–68.

CASP CHECKLISTS - CASP - Critical Appraisal Skills Programme [Internet]. [cited 2022 May 26]. Available from: https://casp-uk.net/casp-tools-checklists/

McEachan RRC, Lawton RJ, O'Hara JK, Armitage G, Giles S, Parveen S, et al. Developing a reliable and valid patient measure of safety in hospitals (PMOS): A validation study. BMJ Quality and Safety. 2014;23(7):565–73.

Sarvi F, Ghaffari M, … MEM journal of the, 2019 undefined. Psychometric properties of the Persian version of the Patient Measure of Safety (PMOS). ncbi.nlm.nih.gov [Internet]. [cited 2022 May 26]; Available from: https://www.ncbi.nlm.nih.gov/pmc/articles/pmc6825390/

Hernan A. Developing the PC PMOS, a Primary-Care Patient Measure Of Safety [Internet]. 2015. Available from: http://aphcri.anu.edu.au

Baxter R, Taylor N, Kellar I, Pye V, open MMB, 2018 undefined. Identifying positively deviant elderly medical wards using routinely collected NHS safety thermometer data: an observational study. bmjopen.bmj.com [Internet]. [cited 2022 May 26]; Available from: https://bmjopen.bmj.com/content/8/2/e020219.abstract

New L, Goodridge D, Kappel J, Lawson J, Dobson R, Penz E, et al. Perceptions of hospital safety for inpatients with chronic kidney disease: A cross-sectional quantitative study. The CANNT Journal. 30(1).

Taylor N, Hogden E, Clay-Williams R, Li Z, Lawton R, Braithwaite J. Older, vulnerable patient view: a pilot and feasibility study of the patient measure of safety (PMOS) with patients in Australia. BMJ Open [Internet]. 2016 Jun 1 [cited 2022 May 28];6(6):e011069. Available from: https://bmjopen.bmj.com/content/6/6/e011069

Schiavone S, Annecchiarico A, Lisi D, Mensorio MM, Attena F. Evaluation of patients' perception of safety in an italian hospital using the pmos-30 questionnaire. International Journal of Environmental Research and Public Health. 2021 May 1;18(9).

Louch G, Reynolds C, Moore S, Marsh C, Heyhoe J, Albutt A, et al. Validation of revised patient measures of safety: PMOS-30 and PMOS-10. BMJ Open. 2019 Nov 1;9(11).

Murphy D, Livingston C, Henriksen B, Dawson A, Singh H, Bond N. Perceptions vs Reality of Patient Flow and Work7ow in a Primary Care Setting. 2018;

Marca-Frances G, Frigola-Reig J, Menéndez-Signorini JA, Compte-Pujol M, Massana-Morera E. Defining patient communication needs during hospitalization to improve patient experience and health literacy. BMC Health Services Research [Internet]. 2020 Feb 21 [cited 2022 May 28];20(1):1–9. Available from: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-020-4991-3

Lawton R, O'Hara JK, Sheard L, Armitage G, Cocks K, Buckley H, et al. Can patient involvement improve patient safety? A cluster randomised control trial of the Patient Reporting and Action for a Safe Environment (PRASE) intervention. BMJ Quality & Safety [Internet]. 2017 Aug 1 [cited 2022 May 28];26(8):622–31. Available from: https://qualitysafety.bmj.com/content/26/8/622

O'Hara JK, Lawton RJ, Armitage G, Sheard L, Marsh C, Cocks K, et al. The patient reporting and action for a safe environment (PRASE) intervention: a feasibility study. BMC Health Services Research [Internet]. 2016 Nov 28 [cited 2022 May 28];16(1):1–14. Available from: https://bmchealthservres.biomedcentral.com/articles/10.1186/s12913-016-1919-z

Jeong HJ, Han SH, Liao HH, Lee WC. Healthcare professionals' perception of hospital and unit-Level managers' contribution to improving safety. Biometrics & Biostatistics International Journal [Internet]. 2020 Mar 9 [cited 2022 May 28];Volume 9(Issue 2):47–52. Available from: https://medcraveonline.com/BBIJ/BBIJ-09-00299.php

Baxter R, Taylor N, Kellar I, Lawton R. A qualitative positive deviance study to explore exceptionally safe care on medical wards for older people. BMJ Quality & Safety [Internet]. 2019 Aug 1 [cited 2022 May 28];28(8):618–26. Available from: https://qualitysafety.bmj.com/content/28/8/618