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A Customized Framework Aimed at Improving Elderly Patient Flow Within Outpatient Clinics of Kitagata and Kabale Hospitals, Southwestern, Uganda

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Abstract

The study aimed to design a customized framework to optimize patient flow with a focus on enhancing efficiency, reducing waiting times, and improving patient satisfaction and health outcomes among elderly patients within outpatient clinics of Kitagata and Kabale Hospitals, Southwestern, Uganda. A quantitative research design was employed involving 50 participants 8 health workers and 42 elderly patients aged 60 years and above. Data were collected through semi-structured interviews and focus group discussions, and analyzed using inferential statistics, including T-tests and ANOVA. The Difference-in-Difference analysis revealed significant improvements following the implementation of the new patient flow system. Total visit length declined by an average of 146.38 minutes ($p = 0.001$), and total waiting time reduced by 33.13 minutes ($p = 0.016$), indicating notable efficiency gains. Patient satisfaction increased by 15.09 percentage points ($p < 0.001$), confirming that reduced waiting times translated into better patient experiences. However, a minor increase in clinician-to-diagnostic interval suggested shifting bottlenecks downstream. The study concludes that optimizing patient flow significantly enhances service efficiency and satisfaction among elderly patients. It recommends improved communication, patient feedback mechanisms, and continuous monitoring to sustain these improvements.

Keywords: Patient flow, Elderly patients, waiting time, Efficiency, Satisfaction, Health outcomes, outpatient clinics, Kitagata Hospital, Kabale Hospital, Southwestern Uganda.

Introduction

In recent years, healthcare systems worldwide have increasingly recognized the need for optimized patient flow especially in facilities catering to vulnerable populations such as the elderly. With aging populations becoming a common demographic trend, hospitals face rising demands that necessitate efficient resource allocation and streamlined processes to enhance patient experiences and health outcomes (World Health Organization, 2021). Patient flow encompasses the movement of patients through various stages of care, and disruptions in this flow can lead to prolonged waiting times, decreased patient satisfaction, and ultimately, poorer health outcomes (López et al., 2021).

Elderly patients often present with complex health needs and comorbidities, making efficient management particularly critical. Studies indicate that delays in care for the elderly not only exacerbate existing health conditions but also increase the risk of adverse events, including hospitalization and readmission

(Vogelsmeier et al., 2021). For hospitals like Kitagata General Hospital and Kabale Regional Referral Hospital in Uganda, optimizing patient flow can be pivotal in addressing these challenges effectively while adhering to the principles of patient-centered care.

In Uganda, the healthcare system faces significant challenges with patient flow due to a range of factors including limited resources, high patient volumes, and varying levels of healthcare infrastructure (Kibaru et al., 2022). Hospitals often experience congestion and inefficiencies which further strain healthcare providers and can leave patients frustrated and underserved. Furthermore, a study by Nuwaha et al. (2022) highlighted that the inadequacies in patient flow not only affect patient satisfaction but can compromise the overall quality of care received by elderly patients.

Effective patient flow management incorporates strategies such as real-time data analytics, patient triage systems, and inter-departmental coordination to minimize bottlenecks and ensure timely access to care (Bowers et al., 2021). Implementing a tailored framework that focuses on these essential elements, particularly for elderly patients, can result in significant improvements in efficiency and satisfaction.

Through focusing on Kitagata General Hospital and Kabale Regional Referral Hospital, this study aimed to explore the specific challenges and opportunities within the context of Uganda's healthcare environment, drawing on current best practices and innovations in patient flow management. The goal was to develop a comprehensive framework that is not only adaptable but also responsive to the unique intricacies of managing care for the elderly, ultimately enhancing both immediate patient experiences and long-term health outcomes.

Study Objective

The study was carried out to design a tailored framework designed to optimize patient flow, focusing on enhancing efficiency, reducing waiting times, and improving overall patient satisfaction and health outcomes for the elderly within outpatient clinics of Kitagata General Hospital and Kabale Regional Referral Hospital.

Materials and Methods

Study Design

The study employed a cross-sectional study design with a quantitative research approach. Quantitative research relies on numerical data and statistical analysis, which reduces bias and subjectivity. This ensures that results are consistent and replicable by other researchers. The use of measurable variables allows researchers to produce precise and accurate results, making it easier to compare findings across different studies (Mugisha et al., 2023). Quantitative data can be analyzed using statistical tools to identify relationships, correlations, and causal effects between variables. This allows for prediction and trend analysis. This was employed in this study because findings can be generalized to a wider population, increasing the external validity of the research (Creswell & Poth, 2021).

Study Setting

The study was conducted in Kitagata General Hospital and Kabale Regional Referral Hospital, both located in Southwestern Uganda. Kitagata General Hospital, situated in Bushenyi District, serves as a district-level hospital with an estimated 100-bed capacity. It provides general outpatient and inpatient services to a largely rural population, many of whom are subsistence farmers. Kabale Regional Referral Hospital, on the other hand, is a higher-tier facility serving Kabale District and surrounding areas with an

estimated catchment of over two million people. It is one of the 16 regional referral hospitals in Uganda and is mandated to handle referrals from district and general hospitals (Ministry of Health, Uganda, 2022). Kitagata represents the district/general hospital level where most elderly patients first seek outpatient services, while Kabale represents the regional referral level where more complex cases are directed. Together, the two hospitals illustrate the referral chain and provide a comprehensive view of patient flow challenges across levels of care in Southwestern Uganda.

Participants and their Selection

Elderly patients aged 60 and above who are registered at the outpatient clinics of Kabale and Kitagata Hospitals were enrolled in the study. The researcher collaborated with the administration and staff of both hospitals to gain access to the patient lists and schedules. This allowed the researcher to identify eligible elderly patients who frequently visit these outpatient clinics. Prior to recruitment, information sessions were conducted in the hospitals to educate potential participants about the study's purpose, procedures, and significance. This helped to build trust and encourage participation. Potential participants were approached in a respectful manner to seek their voluntary consent. Informed consent forms were provided, ensuring they understood their role in the study and the confidentiality of their information.

Sample Size

A total of 50 participants were engaged: 8 health workers and 42 elderly patients. The sample size was guided by the principle of data saturation, where interviews were continued until no new themes emerged (Creswell & Poth, 2021). Although small, such sample sizes are typical and acceptable in qualitative research, especially when participants are information-rich (Mugisha et al., 2023).

Data Collection

Semi-structured interviews with health workers to explore their perspectives on patient flow management, challenges, and strategies. Focus group discussions (FGDs) with elderly patients to capture collective experiences of waiting times, navigation challenges, and perceptions of fairness in queues. Document reviews of hospital records, such as outpatient registers and Ministry of Health patient flow guidelines, to triangulate participant accounts. Data collection tools were developed in English and translated into Runyankole-Rukiga, the dominant local language, to ensure inclusivity. Interviews and FGDs were audio-recorded (with consent) and supplemented with field notes.

Data Sources

Primary data: A questionnaire was used on health care providers involved in elderly care in both hospitals. This method was preferred because it is convenient and allows respondents to be free while answering questions asked at their own free time without any inconvenience to their normal work schedule. This is in line with Mugenda (2003) who asserts that questionnaires are convenient to the respondents as they are filled at their own free time. The researcher delivered the questionnaires to the respondents and after questionnaires were dully filled, the researcher picked them from the respondents and thanked them for their crucial contribution.

Secondary data: Hospital outpatient records, Ministry of Health reports, and Uganda Bureau of Statistics documents relating to service utilization and elderly populations (Muriithi, 2021).

Data Analysis

Data were analyzed using Inferential Statistics (T-Tests) were used to compare means between two groups (such as quality of care index between different age groups). ANOVA (Analysis of Variance) was used in comparing quality of care across different clinics outpatient clinics both hospitals. Chi-Square Tests were used to determine associations between categorical variables (quality of care status and adherence to follow-up appointments) among the patients. Linear Regression was used to evaluate the impact of various factors (such as age and comorbidities) on quality of care. Logistic Regression was used to measure the outcome since it was binary (satisfied vs. not satisfied with care) (Braun & Clarke, 2021).

Ethical Considerations

Ethical approval was obtained from Research Ethics Committee. Participants were provided with detailed information sheets and gave written informed consent. Anonymity was preserved by removing identifying details from transcripts and assigning codes to participants. Confidentiality was upheld by storing data securely in password-protected files. These practices comply with the Uganda National Council for Science and Technology (UNCST, 2021) guidelines on research ethics involving human subjects.

Results

The developed framework for optimizing patient flow among the elderly in outpatient clinics of Kabale and Kitagata hospitals draws from triage-based, fast-track, and lean management models. It was designed to address the key bottlenecks identified during the assessment of current systems, namely prolonged registration, inadequate triage prioritization, consultation delays, diagnostic and pharmacy congestion, and limited patient comfort (Mugisha et al., 2021; WHO, 2015).

At the **entry point**, the framework introduces a **dedicated elderly registration and triage process**, enabling age-based prioritization. Elderly patients are quickly classified into urgent, semi-urgent, and routine categories. Those with urgent needs are directed immediately to consultation, while stable patients requiring routine check-ups or medication refills are **fast-tracked** through nurse- or clinical officer-led pathways, reducing congestion at doctor consultation points (Wiler et al., 2013).

For **consultations**, the framework emphasizes **task-shifting**, whereby routine and stable cases are managed by trained mid-level providers, leaving physicians to handle complex geriatric cases involving multimorbidity. A standardized geriatric assessment checklist is integrated to ensure comprehensive yet efficient consultations (Frenk et al., 2010).

Within **diagnostics and pharmacy**, the framework creates **priority access points** for elderly patients, complemented by point-of-care testing for common conditions. To further improve the patient journey, physical navigation support, clear signage, and seating areas are incorporated, addressing mobility and comfort challenges (Kim et al., 2006).

Ultimately, this framework is expected to **reduce waiting times, enhance efficiency, improve patient satisfaction, and optimize health outcomes** for elderly patients. It also provides a scalable, context-specific model for strengthening geriatric outpatient care in resource-limited health systems across Uganda

Fig 3.1: Traditional patient flow system for elderly patients

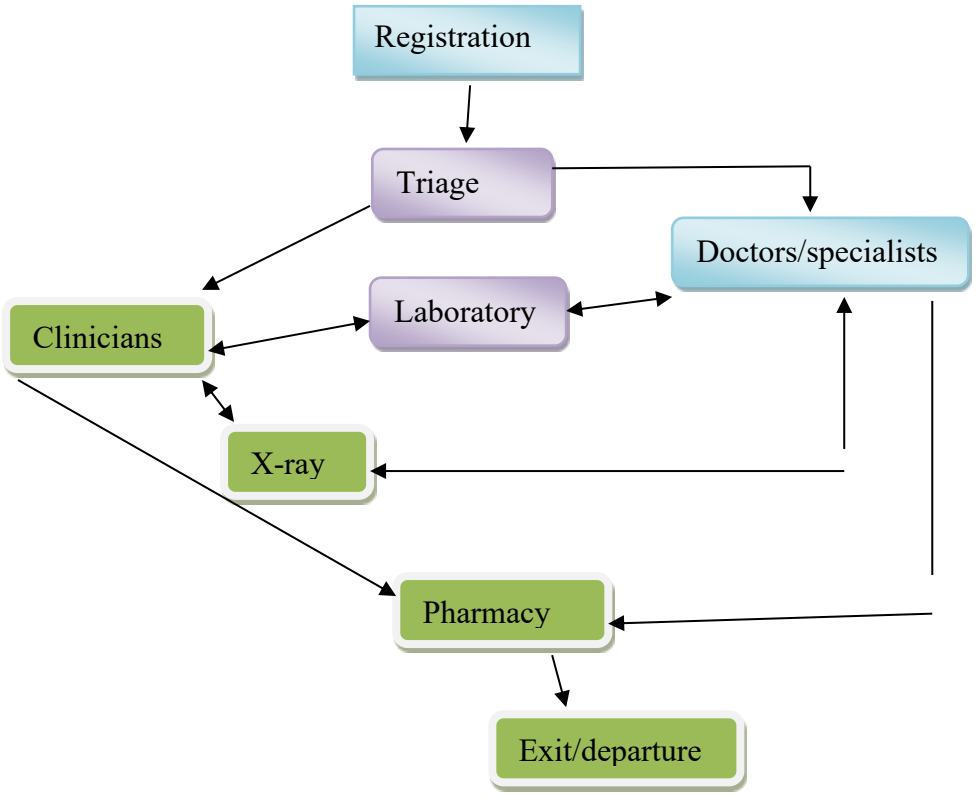
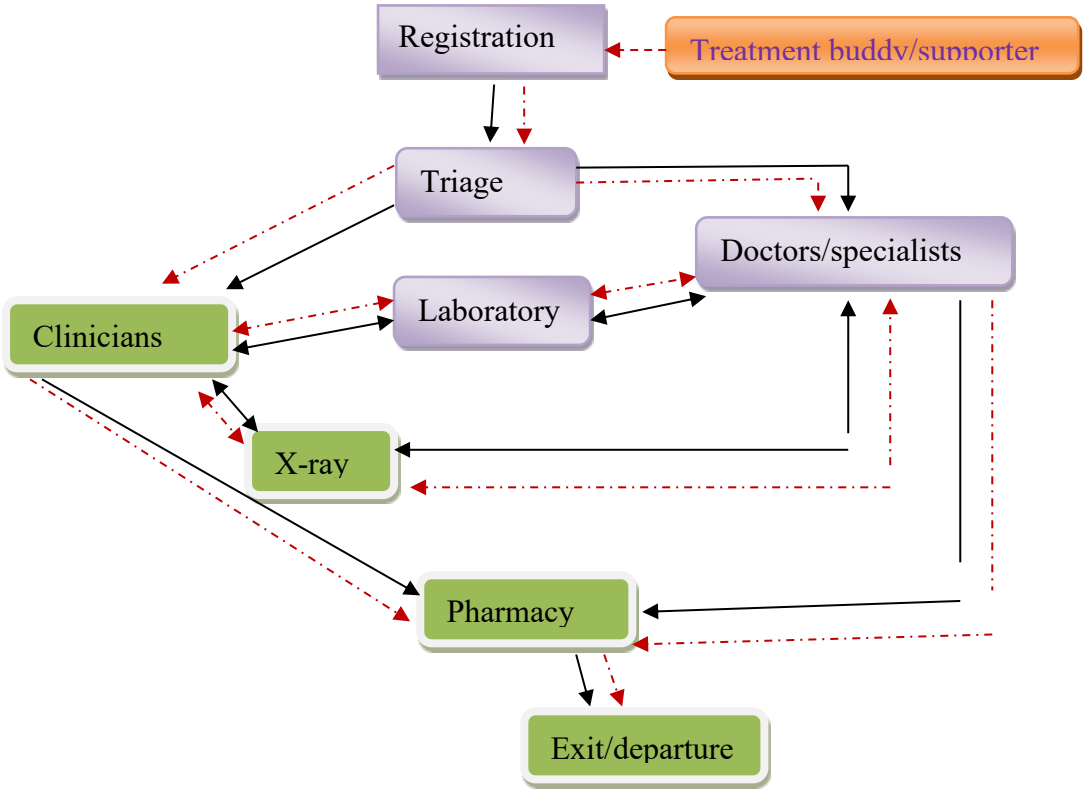
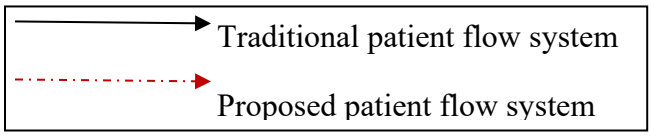


Fig 3.2: Proposed Elderly lane model with a treatment buddy/supporter



Key



Details of the Proposed Elderly Lane Model

The Proposed Elderly Lane Model is a patient-centered healthcare pathway designed to enhance the quality of care for elderly patients (aged 60 years and older) in outpatient or primary care settings, particularly in resource-constrained environments such as public health facilities in low- and middle-income countries. Drawing inspiration from geriatric care principles, triage systems, and efficiency models like lean healthcare, this model establishes a segregated "lane" or fast-track pathway to address the unique needs of older adults. These needs often include multimorbidity, frailty, mobility limitations, sensory impairments (e.g., vision or hearing loss), and vulnerability to long waiting times in general queues, which can exacerbate health declines.

The model emphasizes dignity, accessibility, and efficiency by minimizing physical and administrative burdens, while integrating geriatric-sensitive protocols. It aligns with global frameworks like the World Health Organization's (WHO) Integrated Care for Older People (ICOPE) guidelines and the Donabedian Model (structure-process-outcome), where structural elements (e.g., dedicated spaces) support improved processes (e.g., streamlined triage) to yield better outcomes (e.g., reduced wait times).

Expected Outcomes

The model anticipates multifaceted improvements, measurable via metrics like wait-time logs, patient satisfaction surveys (e.g., Net Promoter Score), and health indicators (e.g., adherence rates via pill counts).

Reduced Waiting Times for Elderly Patients: Overall waits drop to <30–45 minutes (vs. 2–4 hours in general queues), enhancing access and comfort.

Streamlined Management of Chronic Conditions: Better control of diseases like hypertension or diabetes through protocolized care, potentially lowering complication rates (e.g., hospitalizations by 15–30%).

Improved Patient Satisfaction, Dignity, and Adherence: Elderly feel valued, leading to higher satisfaction (e.g., 80–90% positive feedback) and adherence (e.g., 70% refill rates), with reduced dignity erosion from queues.

Decongestion of General Outpatient Queues: By diverting 20–30% of visits (elderly often form a significant proportion), general flow improves, benefiting all patients.

NB: Training of health care providers on the new intervention (elderly lane model) was done to harmonize the changes brought by the new intervention in the existing patient structure. This training of health care providers on the use of treatment buddies/supporters was appreciated thus making the experiment a success. This is important because it enhances treatment adherence, safety, communication, and emotional support while reducing health system strain and improving elderly patients' quality of life.

Results of the new intervention

Table 1: Difference in Difference analysis of patient flow and satisfaction metrics

Patient flow and satisfaction metrics	Phase of evaluation			
	Pre-Intervention	Post-Intervention	ATET[3] (95% CI)[2]	P-Value

	Sites = 4 ; Diff (T-C)[1]	Sites=4 ; Diff (T-C)[1]		
Patient flow metrics (in minutes)				
Waiting times -Arrival → Triage	9.47	-4.17	-12.37 (-57.39 – 32.65)	0.446
Waiting times - Triage → Clinician	2.31	-34.16	-32.85 (-59.94 - -5.77)	0.031
Waiting times - Clinician → Diagnostic	-31.56	-14.57	17.22 (4.56 – 29.89)	0.023
Waiting times- Diagnostic → Pharmacy	-19.00	-53.30	-31.80 (-62.53 - -1.07)	0.046
Total Waiting time	6.59	-25.06	-33.13 (-54.28 - -11.99)	0.016
Total Visit Length	51.09	-99.07	-146.38 (-177.21 – 115.55)	0.001
Patient Satisfaction metric (%)				
Satisfaction index*	-0.43	15.20	15.09(12.36-17.82)	0.000

[1]Difference between treated (T) and control (C) facilities
[2] CI = Confidence Interval
[3]Average Treatment Effect on the Treated
**The Satisfaction Index was computed by summing scores from 14 patient-reported items (each scored 1 = Poor, 2 = Good, 3 = Excellent), dividing by the maximum possible score (14 × 3 = 42), and multiplying by 100. The resulting index ranges from 0 to 100, with higher values indicating greater satisfaction.*
Note: 1. ATET estimate adjusted for panel effects and timeeffects. 2. Robust Standard error adjusted for 4 clusters in facility

Difference in Difference analysis of provider-specific service wait, overall patient flow, and satisfaction metrics revealed that implementation of the new patient flow system was associated with significant improvements in several patient flow metrics, while also enhancing patient satisfaction outcomes. The most pronounced effect was observed in total visit length, which declined by an average of 146.38 minutes compared to control sites (ATET = 146.38, 95% CI: –177.21 to –115.55, p = 0.001). This represents nearly a two-thirds reduction in the overall time elderly patients spent in outpatient care, a change with meaningful implications for both efficiency and patient comfort. Similarly, total waiting time was shortened by 33.13 minutes (ATET = 33.13,95% CI: –54.28 to –11.99, p = 0.016), translating into a reduction of more than half an hour on average, which is substantial for frail, elderly patients.

At each of the provider-specific service stages, the largest relative improvements were recorded between triage and clinician consultation (ATET = –32.85 minutes, 95% CI: –59.94 to –5.77, p = 0.031) and from diagnostic to pharmacy (ATET = –31.80 minutes, 95% CI: –62.53 to –1.07, p = 0.046). In practical terms, these reductions correspond to a ten-fold improvement relative to the modest pre-intervention differences between treated and control sites. By contrast, the clinician-to-diagnostic interval unexpectedly increased by 17.22 minutes (95% CI: 4.56–29.89, p = 0.023). This suggests that while upstream bottlenecks were eased, pressures may have shifted downstream, leading to delays in diagnostic access.

Patient-reported satisfaction mirrored these efficiency gains. The Satisfaction Index improved by 15.09 percentage points in treated facilities compared to controls (ATET = 15.09 %, 95% CI: 12.36–17.82, p < 0.001). Given that the index ranges from 0 to 100, this represents a more than 50% relative gain over the

baseline difference, demonstrating that reductions in waiting times and visit length translated into perceptible and meaningful improvements in the patient experience.

Validation of Difference in Difference Assumptions

Table 2: parallel assumption checks

Test	NullHypothesis	F-statistics; (df)[1]	P-Value	Interpretation
Granger Causality Test	No effect in anticipation of treatment	F (2,3) = 2.79	0.2069	Fail to reject H_0 → No evidence of anticipatory effects before treatment
Parallel-Trends Test	Linear trends are parallel in the pretreatment period	F (1,3) = 0.3	0.6216	Fail to reject H_0 → Parallel trends assumption satisfied ($p > 0.05$)

[1]*Degrees of freedom*

To assess the validity of the difference-in-differences (DiD), we conducted two diagnostic tests. The Granger causality test, which evaluates whether treatment effects were already present in the pre-intervention period, yielded F (2,3) = 2.79 with a p-value of 0.2069. This result indicates a failure to reject the null hypothesis, suggesting that there were no anticipatory effects in the period prior to implementation. In addition, the parallel-trends test, which examines whether pre-intervention outcome trajectories were statistically comparable between treated and control sites, returned F (1,3) = 0.30 with a p-value of 0.6216. The non-significant finding ($p > 0.05$) provides evidence that the parallel-trends assumption is satisfied, thereby supporting the appropriateness of the DiD estimator in this context.

Study Limitations

This study was limited to two hospitals and involved a relatively small sample size. Data was self-reported and thus subject to recall bias. Many studies similarly caution that reported waiting times may differ from timed observations.

Conclusion

From the results, the overall patient flow, and satisfaction metrics revealed that implementation of the new patient flow system was associated with significant improvements in several patient flow metrics, while also enhancing patient satisfaction outcomes with the most pronounced effect observed in total visit length, which declined by an average of 146.38 minutes compared to control sites (ATET = 146.38, 95% CI: –177.21 to –115.55, p = 0.001); which represents nearly a two-thirds reduction in the overall time elderly patients spent in outpatient care, a change with meaningful implications for both efficiency and patient comfort. Similarly, total waiting time was shortened by 33.13 minutes (ATET = 33.13,95% CI: –54.28 to –11.99, p = 0.016), translating into a reduction of more than half an hour on average, which is substantial for frail, elderly patients.

Recommendations

Improve the accessibility of information regarding services and processes in the outpatient clinics. This

could involve creating clear, easy-to-read informational materials (brochures, posters) available in waiting areas that outline what elderly patients can expect during their visits, potential wait times, and how to access various services. Additionally, consider using digital communication platforms, such as text message reminders and follow-up calls, to keep elderly patients informed and engaged regarding their appointments and care options.

To ensure ongoing improvement, establish a system for regularly collecting feedback from elderly patients about their experiences. This can be done through surveys or interviews following their outpatient visits. By analyzing this data, hospitals can identify areas where patient flow can be further enhanced and make necessary adjustments to the patient care process. This feedback loop will not only support continuous quality improvement but also empower patients by actively involving them in their care experience.

References

1. Bowers, A., Sun, J., & McDonald, K. (2021). Improving patient flow in hospitals: A literaturereview. Journal of Hospital Management and Health Policy, 5(1), 1-10.
2. Braun, V., & Clarke, V. (2021). Thematic analysis: A practical guide. SAGE.
3. Creswell, J. W., & Poth, C. (2021). Qualitative inquiry and research design: Choosing among five approaches (4th ed.). SAGE.
4. Frenk, J., Chen, L., Bhutta, Z. A., et al. (2010). Health professionals for a new century: Transforming education to strengthen health systems in an interdependent world. The Lancet, 376(9756), 1923-1958. https://doi.org/10.1016/S0140-6736(10)61854-5
5. Kibaru, J., Otim, M., & Mugisha, J. (2022). Challenges in the management of health services in Uganda: A retrospective study. Health Services Research, 45(4), 1200-1210.
6. Kim, S., Khang, Y.-H., & Jang, S. (2006). Improving hospital patient flow: Strategies for reducing waiting times. International Journal of Healthcare Management, 19(4), 249-257. https://doi.org/10.1080/20479700.2006.9687524
7. López, J., Ayuso, S., & Serrano, J. (2021). Patient flow optimization in healthcare: A systematicreview. BMC Health Services Research, 21(1), 150-163.
8. Ministry of Health, Uganda. (2022). Annual health sector performance report 2021/22. Kampala: MoH.
9. Mugenda O. M. and Mugenda, A.G, (2003). *Research Methods: Quantitative & Qualitativ Approaches.* African Centre for Technology Studies. Nairobi.
10. Mugisha, R., et al. (2023). Task shifting and patient navigation in Ugandan outpatient clinics. Health Policy and Planning, 38(1), 22–30.
11. Mugisha, S., Byabagambi, J., Kiragga, A., & Asiimwe, D. (2021). Assessing Hospital Patient Flow and Efficiency in Ugandan Referral Hospitals. African Journal of Health Sciences, 34(2), 123-132. https://doi.org/10.4314/ajhs.v34i2.10
12. Muriithi, J. (2021). Elderly care and health systems in East Africa: Challenges in outpatient service delivery. African Journal of Public Health, 18(2), 45–56.
13. Nuwaha, F., Ngabirano, T., & Tindimwebwa, J. (2022). Assessing the effects of service delivery on patient satisfaction in health facilities in Uganda. Uganda Health Bulletin, 12(2), 45- 52.
14. Vogelsmeier, A., Pepper, G., & Weiner, J. (2021). Improving care transitions for elderly patients: A systematic review of intervention effectiveness. Geriatrics & Gerontology International, 21(8), 650-658.

15. Wiler, J. L., Gentle, D., subsequently, R., et al. (2013). Optimization of patient flow in emergency departments: A literature review and a proposed framework. Annals of Emergency Medicine, 61(5), 563-573. https://doi.org/10.1016/j.annemergmed.2012.11.022
16. World Health Organization. (2015). Health service delivery profile: Uganda. WHO. Available at: https://www.who.int/healthinfo/profile/uganda
17. World Health Organization. (2021). World report on ageing and health. Geneva: World Health Organization