IMPACT OF TELEMEDICINE ON PATIENT OUTCOMES IN RURAL HEALTHCARE SETTINGS:

QUANTITATIVE RESEARCH PROTOCOL

FAMH4012A Research Methodology

GROUP 1

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OVERVIEW

- Background
- Rationale
- Objectives
- Research Question
- Inclusion & Exclusion Criteria
- Search Strategy
- Ethical Considerations
- Conclusion
- Reference

BACKGROUND

Geographical and logistical obstacles frequently restrict access to in-person care in rural areas, where telemedicine has emerged as a viable way to alleviate healthcare inequities. Despite the growing adoption of telemedicine, there remains a need for robust empirical evidence to evaluate its effectiveness in improving patient outcomes in these rural areas.

RATIONALE

Rural populations face significant barriers to accessing healthcare, including geographical isolation, a shortage of healthcare professionals, and inadequate transportation options. These challenges contribute to poorer health outcomes compared to urban populations (Douthit et al., 2015).

OBJECTIVES

- To compare health improvement indicators between telemedicine users and non-users in rural areas.
- To assess patient satisfaction with telemedicine services compared to traditional care.
- To determine if telemedicine reduces hospital visits and readmission rates among rural patients.

RESEARCH QUESTION

PCC Framework

Population: Patients in rural clinics utilizing telemedicine services.

Concept: Effectiveness of telemedicine

Context: Healthcare access and patient outcomes in rural healthcare settings.

Research Question

What is the effectiveness of telemedicine in improving healthcare access and patient outcomes for rural patients in rural healthcare settings?

Study Design:
Prospective Cohort Study

- This design allows for longitudinal tracking of health outcomes over time, comparing patients using telemedicine versus those receiving traditional in-person care.
- A randomized controlled trial (RCT) was deemed impractical due to ethical concerns regarding withholding telemedicine from some patients (Kavanaugh et al., 2017).

METHODOLOGY

Tools:

- **Patient Surveys:** Measures satisfaction, usability, and perceived benefits of telemedicine (Kavanaugh et al., 2017).
- **Clinical Assessments:** Blood pressure (BP), glucose levels (HbA1c), and other disease markers.
- **Electronic Health Records (EHRs):** Tracks hospital visits, readmissions, and medication adherence.

Quantitative

Sample Size Calculation:

Using power analysis (80% power, 95% confidence level), a minimum of 400 participants will be required:

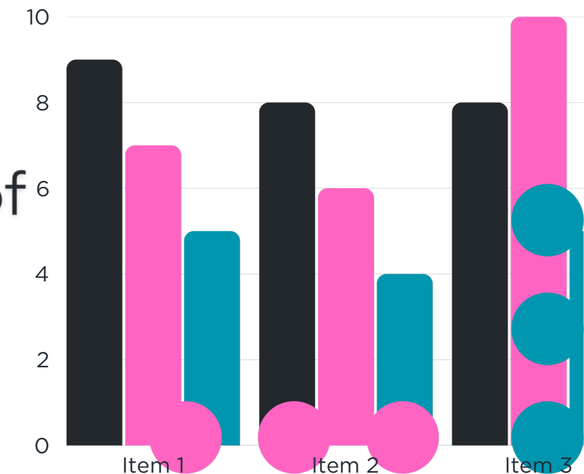
- 200 in the telemedicine group.
- 200 in the traditional care group.

(Machin, McNally and Viarengo, 2018).

DATA ANALYSIS PLAN

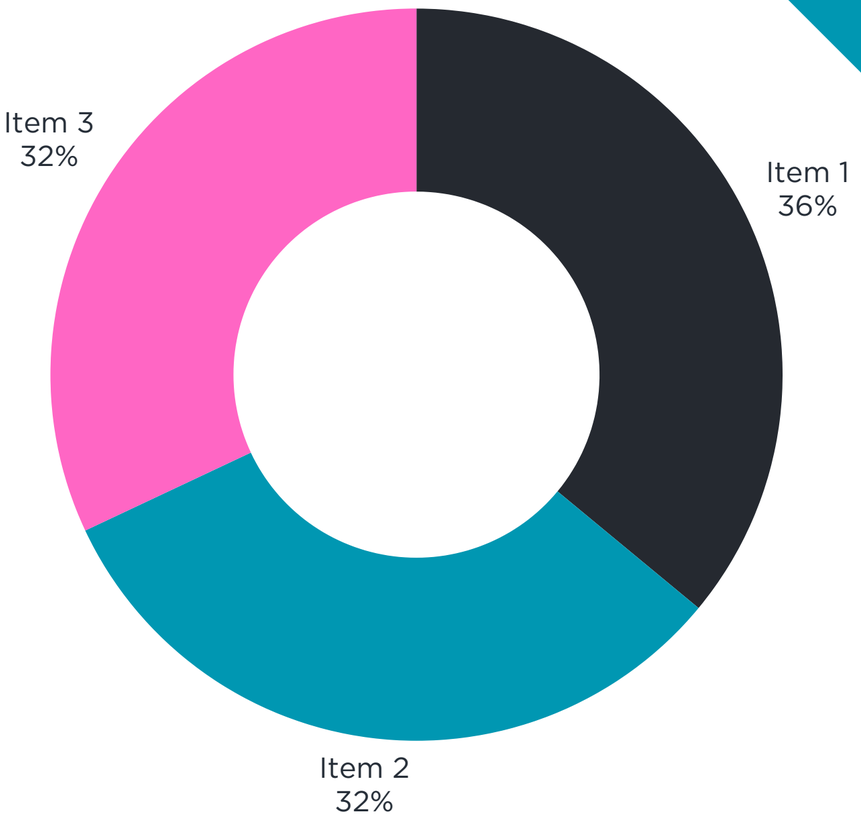
Statistical Methods:

- **Descriptive Statistics:** Mean, median, and standard deviation for continuous variables; frequency distributions for categorical variables.
- **Comparative Analysis:**
  - t-tests for mean comparisons (e.g., BP levels in telemedicine vs. non-telemedicine groups).
  - Chi-square tests for categorical variables (e.g., readmission rates).
- **Multivariate Analysis:**
  - Regression Analysis to determine the predictive impact of telemedicine on health outcomes, controlling for confounders.



MEASUREMENT SCALES:

- Patient satisfaction: 5-point Likert scale (1 = Very Dissatisfied, 5 = Very Satisfied).
- Health outcomes: Continuous scales (e.g., BP in mmHg, HbA1c %).
- Healthcare utilization: Frequency count (number of visits, admissions).



Ethical Considerations

- **Informed Consent:** Participants will provide written informed consent before enrollment.
- **Confidentiality:** All data will be anonymized and securely stored.
- **Ethics Approval:** The study will undergo Institutional Review Board (IRB) approval (Office for Human Research Protections, 2024).
- **Risk Minimization:** Participants can withdraw at any time without consequences to their medical care (Resnik, 2018).

POTENTIAL CHALLENGES & LIMITATIONS

- **Limited Internet Access:** Some rural areas may have poor connectivity.
  - Solution: Provide mobile hotspots or conduct telemedicine visits via phone calls.
- **Self-Reporting Bias:** Patients may overestimate their satisfaction.
  - Solution: Cross-check self-reported data with clinical outcomes.
- **Loss to Follow-Up:** Patients may drop out of the study.
  - Solution: Regular follow-ups, incentives, and reminders via SMS.

STUDY TIMELINE

Phase	Duration	Activities
Planning & Ethics approval	2 months	IRB approval, study design finalization
Participant Recruitment	3 months	Enroll patients from rural clinics
Data Collection	6 months	Conduct surveys, clinical assessments
Data Analysis & Interpretation	2 months	Statistical analysis, report writing
Dissemination of Findings	1 month	Presentation, policy recommendations

CONCLUSION

- This study will provide critical data on whether telemedicine improves patient outcomes in rural areas. The findings will guide policy decisions, help optimize telemedicine programs, and enhance healthcare access for underserved communities.

References

Douthit, N., Kiv, S., Dwolatzky, T. and Biswas, S. (2015). Exposing some important barriers to health care access in the rural USA. Public Health, 129(6), pp.611–620. doi:https://doi.org/10.1016/j.puhe.2015.04.001.

Kavanaugh, M.J., So, J.D., Park, P.J. and Davis, K.L. (2017). Validation of the Intensive Care Unit Early Warning Dashboard: Quality Improvement Utilizing a Retrospective Case–Control Evaluation. *Telemedicine and e-Health*, 23(2), pp.88–95. doi:https://doi.org/10.1089/tmj.2016.0073.

Machin, S., McNally, S. and Viarengo, M. (2018). Changing How Literacy Is Taught: Evidence on Synthetic Phonics. *American Economic Journal: Economic Policy*, 10(2), pp.217–241. doi:https://doi.org/10.1257/pol.20160514.

Office for Human Research Protections (2024). *The Belmont Report*. [online] U.S. Department of Health and Human Services. Available at: https://www.hhs.gov/ohrp/regulations-and-policy/belmont-report/index.html.

Resnik, D.B. (2018). *The Ethics of Research with Human Subjects*. [online] *International Library of Ethics, Law, and the New Medicine*. Cham: Springer International Publishing. doi:https://doi.org/10.1007/978-3-319-68756-8.

U.S. Department of Health & Human Services (2020). *Health Information Privacy*. [online] HHS.gov. Available at: https://www.hhs.gov/hipaa/index.html

Thank You

For your attention