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Mobile Health Clinic as a Medium for Reducing Health Disparities in Underserved Populations

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Mobile Health Clinic as a Medium of Reducing Health Disparities in the Underserved

Populations

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Abstract

Background: Universal access to healthcare services is essential in health promotion and disease prevention. It has been demonstrated that further quality improvement is needed in accessibility of health services, health promotion and disease prevention to improve populations' health outcomes. The use of mobile health clinics (MHC) may benefit underserved populations in rural areas of Georgia. MHCs provide modes of healthcare delivery to people with limited health services. Poor access to healthcare for people in rural areas is associated with increased morbidity and mortality rates. For many in rural areas, MHC may be the only resource that offers effective options. **Purpose:** To determine the effectiveness of the use of MHC in the reduction of barriers to access and health disparities in the rural and the underserved areas. **Methods:** Project utilized a descriptive design with participants recruited via convenience sampling. Participants completed a 12-item questionnaire that assessed the needs for mobile health clinic. **Results:** A total of 52 questionnaires were collected. Descriptive statistics were used to analyze the findings. **Discussion:** Evidence denotes the importance of MHC as an effective means of reducing healthcare services barriers. Despite decreased awareness about MHC, 96% of participants would use MHC if available in their area. The limitations of MHCs are limited availability and long-term sustainability.

Keywords: mobile health clinics, needs assessment, healthcare barriers, healthcare disparities, vulnerable populations.

Mobile Health Clinic as a Medium of Reducing Health Disparities in the Underserved Populations

The purpose of this paper is to present and explain the author's Doctor of Nursing Practice (DNP) quality improvement project. The goal of this project was to reduce health disparities in rural areas of Georgia with the use of mobile health clinics. Specifically, the objective of this project was to determine the effectiveness of the use of mobile health clinic (MHC) in the reduction of barriers to access and health disparities in the rural and the underserved areas of the state.

Problem Statement

Access to basic healthcare is a problem faced by many people living in the rural and the under-served areas of the country. In fact, in the state of Georgia, decreased access to health services affect the health and well-being of many in the rural counties. The Georgia Online Analytical Statistical Information System (OASIS) report indicates that health disparities are evident in the state especially in the 34 rural counties of the state where the effects of limited access to care have the most impact (OASIS, 2014). In addition, the report also suggests that health outcome rankings in Georgia's rural counties are among the worst out of the 159 counties in the state (OASIS, 2014). Despite the improvements in the initiatives to address disparities by the United States Department of Health and Human Services (HHS) in 2011, barriers to health services still persist. The intended objective of the Disparities Action Plan and the Affordable Care Act (ACA) to advance efforts in reducing health disparities have not achieved its goal of a nation free of imbalance in health and health care (AHRQ, 2011). Universal access to healthcare service is essential in health promotion and disease prevention. Restricted or inadequate access to healthcare for people in underserved areas is associated with increased morbidity and

mortality rates (HHS, 2016). The implications of limited access to healthcare services are consequently, affecting the most vulnerable populations in many rural areas in the state of Georgia.

Background/Significance

The United States (HHS) describes health disparity as a higher burden of illness, injury, disability, or mortality experienced by defined population groups; it results from the differences in access to quality of care or availability of facilities and services (HHS, 2016). The agency (HHS) also includes health variation in rates of disease occurrence and disabilities in socioeconomic or geographical differences between population groups (HHS, 2016). Lack of access to care is the major factor and the leading cause of healthcare disparities in the under-served population; these barriers prevent people from getting quality healthcare services (AHRQ, 2011). In fact, the burden of health disparities not only affect individuals, but the society as a whole; the joint center for political and economic studies estimates medical care expenditures associated with health disparities, costs at \$229.4 billion for direct medical care expenditures and \$1 trillion for the indirect costs of disparities (HHS, 2016). Financial cost may be part of the deterrent factors for many in getting medical checkups, but for many people in rural areas, MHCs tend to be the only and more feasible resource (McCoy, Williams, Atkinson, & Rubens, 2016; Rodriguez, Appelt, Young, & Fox, 2007). MHC offers a cost-effective option in addressing the health service needs of the vulnerable populations. The World Health Organization (WHO) has routinely demonstrated and amplified the importance of mobile health clinic as an effective means to provide health services to the vulnerable and under-served population. The agency regularly deploys its diverse mobile health clinics/ wheel-based health care, and medical teams to reach people who are cut off from access to health services due to

disasters, wars and other humanitarian crisis (WHO, 2016). MHCs are specially customized and medically equipped vehicles used by a team of healthcare professionals and providers to travel to various parts of the communities, both rural and urban areas, to provide preventative health screenings and other healthcare services to the people at their neighborhoods or their workplaces. These services are aimed at reducing the barriers of time, money and accessibility; MHCs provide most importantly, a community-tailored healthcare services to the uninsured, low-income, the underserved and vulnerable populations (Mobile Health Map, 2018). Currently, there are approximately 2000 MHCs in the United States and one registered MHC (Mercy Care Mobile Healthcare) in the state of Georgia (Mobile Health Map, 2018).

The main objective of this project was to explore the effect of Mobile Health Clinic (MHC) utilization in a community in Georgia.

Clinical Question

In underserved populations (P), what effect can mobile health clinic utilization (I), have on access and decreased variances in healthcare services (O)?

Search Strategy

The literature search was conducted using the following databases: CINAHL, PubMed, and EBSCO. A combination of keywords were used including mobile health clinic and mobile health unit. Additional medical subject headings (MESH) were used: vulnerable populations randomized controlled trial, qualitative study, and health disparities. An additional search was conducted by reviewing reference lists papers that conducted systematic reviews. Search parameters spanned the years between 2009 and present; there was an exception for a 2007 article that was deemed relevant. Searches were peer reviewed and scholarly articles. Other inclusion criteria were primary research studies and published in English language. The inclusion

criteria involved also studies that surpassed the limitations, provided a model that could be replicated, included pitfalls of implementing a mobile health unit. Some of the articles used were Levels V, VI and two levels II and III. Some relevant international articles were included for contrast.

Review and Synthesis of the Literature

The main themes that emerged from the literature were access barriers and the impact of it on the vulnerable and underserved populations. Access to healthcare was identified as one of the challenges affecting many people in remote areas (AHRQ, 2011). Rural residents experience many difficulties in accessing health care services; these limitations and disadvantages result in higher morbidity and mortality rates compared to those residents in urban areas (AHRQ, 2011; Kyounghae, et al, 2016; Rodriguez, Appelt, Young, & Fox, 2007). The review of the literature began with identifying what type of barriers exist for accessing healthcare, especially in the underserved populations. A qualitative study conducted by Taber, Leyva, & Persoskie (2015) with 1,369 participants (40% male with a median age of 49) to present comprehensive reasons and categories of why people avoid medical care, identified three main reasons in adults for avoiding medical care. These three factors are fear of unfavorable health evaluations, low perception of actual care needs, and traditional barriers such as costs. After identifying these barriers, the researchers used the findings to assess the impact of local healthcare workers to understand if implementation of healthcare alternatives can be effective. A systematic review of (n=61) articles that met inclusion criteria by the reviewers, revealed that interventions (MHC) conducted by community-based healthcare workers were the most effective in underserved communities (Kyounghae, et al, 2016). The purpose of the study was to determine the type of interventions community-based healthcare workers provide and what were the patient outcomes?

The authors concluded in the studies that community-based health interventions were most effective in underserved communities where health disparities were the greatest. The authors also suggested that there was a need for such healthcare resources and interventions at the local level that can reduce these healthcare disparities (Kyounghae et al, 2016).

Three systematic reviews of MHC implementation in the rural communities proved to be a cost-effective means of intervention in addressing health disparities and access barriers. Most of the articles reviewed, studied the various factors of mobile health clinics. The common focus of these articles was examining the effects of these mobile health clinics on diverse population groups. A five-stage scoping review was conducted by Matthew-Maich, et al, (2016) that found there was a limited use of mobile health clinics for older adults with chronic conditions due to barriers of implementation. Use of this health tool is feasible in this particular population as an acceptable form of primary care (Rodriguez, Appelt, Young, & Fox, 2007). Another population frequently mentioned was the veterans. A single-blind random control study was conducted on veterans that suffered an ischemic or hemorrhagic stroke (n=48) within two years (Chumbler, Quigley, Li, Morey, Rose, Sanford, & Hoenig, 2012) of the study. They found that veterans that had tele-rehabilitation had significantly improved physical function.

Researchers also attempted to study disease processes and their incidence after implementation of a mobile clinic. A pilot program initiated in a rural town of India found decreased rates of sexually transmitted infections over a span of three years (Kojima, Krupp, Ravi, Gowda, Jaykrishna, Leonardson-Placek, & Madhivanan, 2017). A systematic review of mobile health systems implemented in U.S. rural communities showed similar results.

Telemedicine interventions were found to both improve patient outcomes and be cost effective (Yu, Hill, Ricks, Bennet, & Oriol, 2017). Fourteen articles that were reviewed had Levels V, VI

and two levels II and III. Three systematic reviews of MHCs implemented in U.S. rural communities showed both cost-effectiveness and improved patient outcomes.

The author used the Grading of Recommendations Assessment, Development and Evaluation (GRADE) level of evidence rating system to assess the quality of evidence presented in the literature. The GRADE has four categories of rating the quality of evidence which ranges from:

- (A) High- Quality of Evidence: Means several high quality studies had consistent results
- (B) Moderate- Level of Evidence: Shows the study has at least, one high quality research study and some of the studies with limitations
- (C) Low- Level of Evidence: Has one or more studies with severe limitations
- (D) Very Low- Level of Evidence: Study uses expert opinion; there are more than one research studies with very severe limitations (Grading Group, 2016).

Gaps in Knowledge

The research recommendation for MHCs based on the GRADE's rating ranged from moderate to high. There is a gap in the field in regards to mobile health clinics and long-term sustainability. The literature review also shows that rural communities and older adults benefit from mobile health clinics and can serve as a source of primary care. In summary, the research evidence denotes the importance of MHC as an effective means of reducing healthcare services barriers.

Most of the research studies included in this paper, have demonstrated the benefits of mobile health clinics. The research findings showed that utilization of MHCs not only improved access to care but it also reduced the healthcare costs-associated with emergency room visits (McCoy, Williams, Atkinson, & Rubens, 2016; Kojima, et al., 2017; Yu, et al., 2017;). MHCs

are effective model of healthcare delivery to people with limited access to health services (Mobile Health Map, 2018). As indicated in the literature review, the researchers have demonstrated the effectiveness and efficiency of mobile health clinics; the research evidence as stated above showed that rural communities and older adults benefit from mobile health clinics and can also serve as a source of primary care. Inversely, an integral part of the nation's health system and the overall socio-economic development are dependent on the policies for quality healthcare provision, which are based on a scientifically sound and socially acceptable methods for high quality healthcare system (Kyounghae, K. et al, 2016).

Theoretical Framework for Quality Improvement

Through research and review of literature articles, the Florence Nightingale Environmental Theory model, ideas and principles were deemed pertinent to the issues to be addressed in the writer's selected scholarly project on reducing health disparities in the underserved populations. It is important to have a framework that connects all the necessary aspects and the focus of any project. A conceptual framework is the roadmap that guides or shows the direction of the project of interest such as structure, process and outcome (Moran, Burson & Conrad, 2017). A theoretical framework on the other hand, is designed as a guide to a DNP scholarly project to explain, support or challenge existing theories or assumptions (Moran et al. 2017). Nightingale's Environmental Theory involves consideration of external environmental factors not only the individual patient but the context of the external environmental factors that impact the health outcomes (Hegge, 2013). The external environmental factors that influence the health outcomes of the underserved are geographical, socioeconomic and political factors (HHS, 2016). Therefore, the utilization of MHC was a means of incorporating the external factors and finding a defined way of reducing access barriers

and bringing healthcare services closer to the people where they live. The key premise of the theory is using the patient's environmental settings to bring about healing and health restoration (Hegge, 2013). The Florence Nightingale Environmental Theory was used as a model for this DNP project because the core concept of the theory was deemed pertinent. The goal of the project was to explore measures or ways of making healthcare services more accessible to the underserved populations in rural communities. By using the MHCs to reach people in remote areas, the project aligned with the Nightingale-Environmental theory-incorporation of the patients' environmental surroundings and the external factors in the use of the nursing care plan (Hegge, 2013).

This project was focused on assessing and identifying the external factors that contribute to disparities; the project also explored the effect of MHC utilization in the improvement of healthcare access and recipients' participation in health services. As a true advocate for justice, Florence Nightingale created public awareness, and championed the cause of those suffering as a result of unjust policies (Hegge, 2013). The project also responds to Nightingale's challenge for nurses to create environments where population health is a realistic expectation (Hegge, 2013). Using MHC as the means of reducing barriers to healthcare was one of the options the author used to address access barriers. Nightingale's call for action requires commitment to correct unjust social policies that are detrimental to human health. She invites providers to be equipped with organizational and political skills, integrity, honesty, courage, sensitivity to suffering, and persistence to withstand opposition (Hegge, 2013). Nurses are in an ideal position to challenge unjust social policies and create meaningful reforms to shape a just world of universally accessible health services for the population (Hegge, 2013). The author's DNP preparation enabled the author to address policy issues with research evidence. Universal accessibility of

healthcare services to individuals are essential in maintaining every individual development of self-reliance and self-determination (Hegge, 2013). However, when people in need of those services do not have the means of obtaining their healthcare needs, there should be a defined means of bringing healthcare services closer to where the people live (Hegge, 2013). The Nightingale's theoretical framework was used as a structural guideline that helped the author to address the identified problem of health disparity. Most importantly, the use of this theory was very helpful during the project data collection in creating public awareness regarding the importance of disease prevention and health promotion. According to the American Association of Colleges of Nursing (AACN), public health promotion is a role expectation as a doctor of nursing practice (DNP) prepared provider (AACN, 2015). A DNP prepared provider is equipped to utilize the essential skills to synthesize the psychosocial dimensions and cultural impacts related to population health (AACN, 2015). This also correlates with the 2011 report by the Agency for Healthcare Research and Quality (AHRQ) which noted that barriers to access and quality healthcare are the major factors affecting the under-served populations (AHRQ, 2011). As part of the key aspects of Nightingale's theory, environmental influence was used in this project as a guide in the assessment of access barriers in relation to the external environment factors that affect health outcomes in the rural and under-served populations.

Methodology

The author's DNP quality improvement project was aimed at determining the effectiveness of the use of mobile health clinic (MHC) in the reduction of barriers to access and health disparities; the project is an Exempt Protocol Category 2 classification granted by the Georgia State University Institutional Review Board (IRB). The participants therefore, cannot

and were not identified either directly or indirectly with any personal identifiers according to the exempt-category guidelines.

Participants and Recruitment

Inclusion/exclusion criteria: Eligible project participants in this project data collection met the following criteria:

18 years of age and above male or female

The participant received services from the project clinical site

Can read, speak and write in English

Willing to participate voluntarily

Potential participants were excluded if they did not meet the inclusion criteria above.

The targeted sample size was (participants) $n=60$

This author as the student investigator during the data collection, approached all potential participants that met the criteria at the clinical site waiting area. The author explained the purpose of the data collection after self-introduction and ascertaining the willingness to participate by each individual participant.

Setting

The project data collection took place at a non-profit clinical site located in the outskirts of a small city in Georgia. It is a free health clinic center that provides services to low income, un-insured individuals and the vulnerable populations of the community. The clinic has three patient examination rooms but uses only two out the three rooms most of the time due to shortage of medical providers. The clinic operates two times a week and sees an average of 15 to 25 clients/patients per day depending on the number of medical providers available. The services are provided mostly by volunteer healthcare workers such as, medical doctors, nurse

practitioners, nurses and social service/case workers. The services provided in the clinic include health assessment screenings for cholesterol, blood pressure, diabetes, and other non-emergency ailments; the clinic also provides prescription vouchers for blood pressure and some diabetic medications. This clinic is focused on health promotion and illness prevention in the most vulnerable and at risk population groups of the community.

Instruments/Tools

Data was collected via use of a 12 item paper questionnaire. The questionnaire was comprised of both a 5-point Likert scale (1= Poor, 5= Exceptional for quality of service; 1=Minimal, 5=Excessive for waiting time) and open-ended questions. The questionnaire was designed to assess the needs of a mobile health clinic. The reliability of this questionnaire is unknown to date. A lack of evidence about use of this tool in the population of interest warrants a reliability analysis upon data completion. The questionnaire was administered to participants in a paper and pen format. Completion of the survey took participants approximately 10 to 15 minutes.

Intervention and Data Collection

After meeting the inclusion criteria, participants completed an informed consent. After voluntarily consenting to participate, then participants were invited to complete the questionnaire. All questionnaires were distributed and collected by the student investigator.

Protection of Participants

The survey was collected by the student investigator, information for analysis was stored in a locked file cabinet and password and firewall-protected computer. No names or protected health information were collected for this study. Information will be destroyed at the end of the project conclusion.

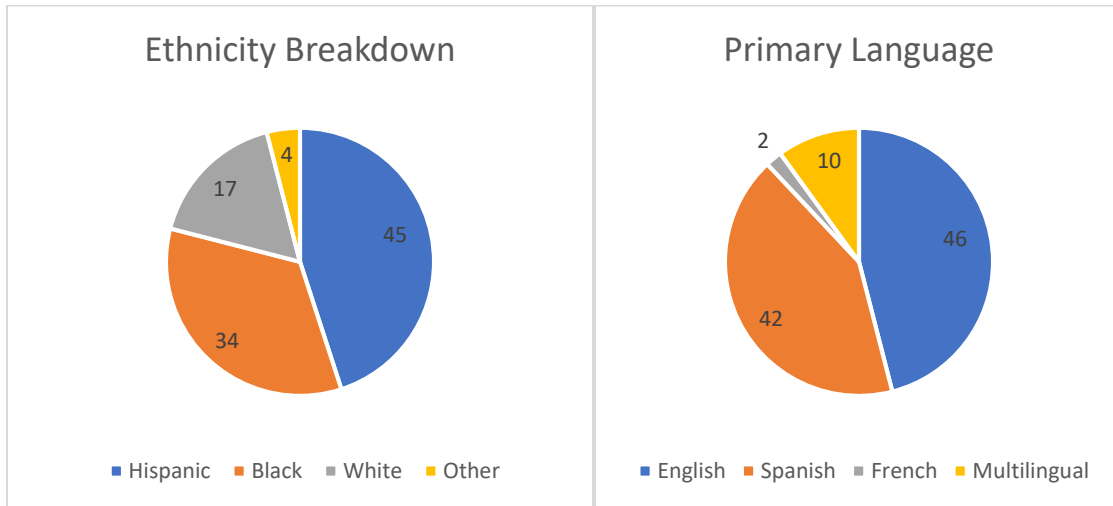
Analysis

Data was translated from the paper questionnaires to Microsoft Excel® and IBM Statistical Package for the Social Science (SPSS) version 25. Descriptive statistics were conducted to summarize the results.

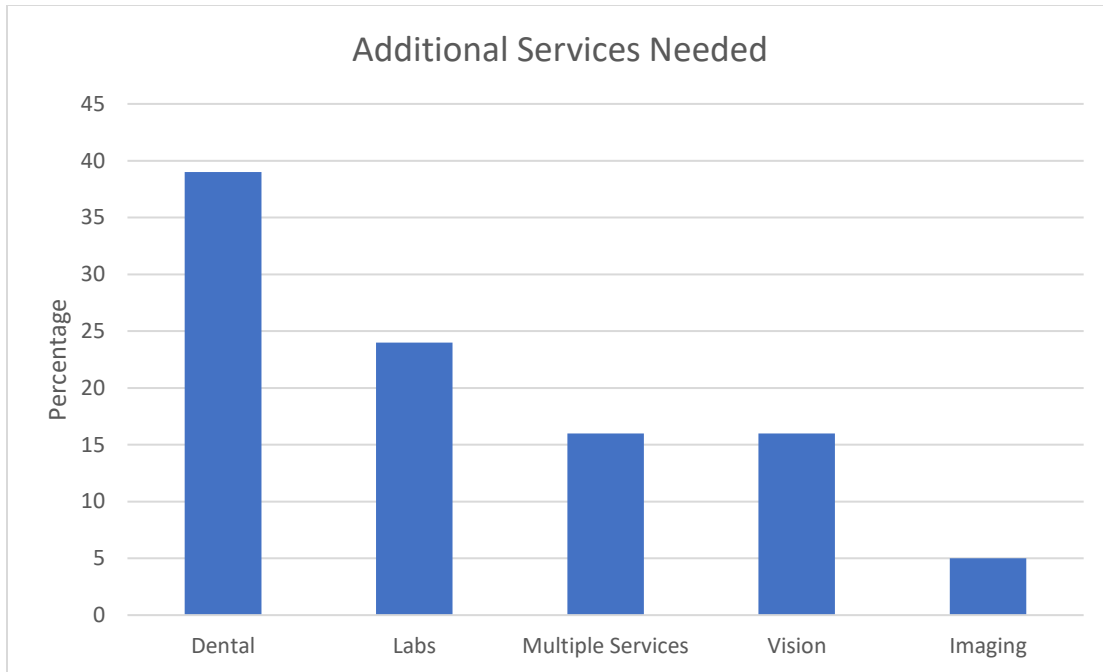
Results

Descriptive Analysis

A total of 52 clients of the health clinic participated in the study. The targeted sample size was not reached due to time limitation in data collection and the exclusion of many that could have been participants but did not meet the inclusion criteria. The demographics of the study group are as follows: 53% male (n=27) and 47% female (n= 25); 50% aged 50-69 (n= 26), 46% aged 30-49 (n=24), and 2% aged 70-89 (n=2).



The clinic had 85% repeat users. Ninety-six percent of these repeat visitors would use a mobile health clinic if one was in their neighborhood. Some services requested by the participants are represented in the table below.



Additional analysis of this correlation will be conducted to see if there are additional trends among race, age, and/or employment status.

Open-Ended Responses

The first open ended question asked the participant if he/she used a mobile health service, how was the experience. None of the participants responded to this question. The second open-ended question asked what additional services would you like to see offered at the clinic. The responses are tabulated in the table above. The final open-ended question asked for additional comments about the clinic site. The responses were as follows: “life saver”, “very good place,” “great service,” “continue to stay open,” “God bless the staff,” ”very valuable,” and “nice services.”

Discussion

The aim of this DNP Project was to explore, determine and to evaluate the outcomes of the project’s clinical question: In underserved populations (P), what effect can mobile health clinic utilization (I), have on access and decreased variances in healthcare services (O)?

Participants in this project reported a positive attitude towards the use of MHC for health services. Participants will use MHC if it was available in their neighborhood. The results also indicate that MHC if more accessible, it will increase the use of healthcare services in this population. This project's findings showed the obvious need for MHCs. The participants indicated that the use of MHC would be helpful in their area due to lack of health insurance, income, transportation and cost/affordability of other options of transportation such as taxis; they reported that their area did not have public transportation. The concerns and desires of these participants about healthcare accessibility were clearly demonstrated on the comment section of the questionnaire. The care recipients from this non-profit clinic that participated in the questionnaire survey showed that community-based health interventions were most effective in underserved communities where health disparities were greatest (Kyounghae, et al., 2016). The needs for such healthcare resources such as MHCs interventions at the local level that can reduce these healthcare disparities would benefit the community (Kyounghae et al, 2016; McCoy, Williams, Atkinson, & Rubens, 2016; Kojima,et al., 2017). Some of the unexpected findings were the significant number of participants that used this clinic site as their primary source for healthcare services. The data underscores the necessity of MHCs in rural and underserved populations of the community. The limitations of this study were sample size, limited MHC sites and language barriers; for instance, there were multiple occasions very few data were collected because most of the clients did not meet the inclusion criteria; they can only read and write in Spanish. Therefore, the questionnaire written in English language only prevented the capture of a more robust data that represented the true ethnicity make-up and the demographics of the clientele served in the clinic.

Practice Implications

An integral part of the nation's health system and the overall economic/social development are dependent on the policies that guide essentials for quality healthcare provision that are based on a scientifically sound and socially acceptable methods for high quality healthcare system (Kyounghee, K. et al, 2016). In response to Nightingale's call for action, the author chose this project as a measure to tackle disparity problems by exploring the possibility of using mobile health clinics as the medium for reducing health disparities in under-served populations. Advancements in nursing science, specifically middle-range nursing theories, expanded the discipline of nursing, and a thorough understanding of nursing theory provides a solid foundation for the advanced nursing scope of practice (AACN, 2015). The doctor of nursing practice (DNP) degree prepares the graduates to integrate nursing science with organization, biophysical, psychological, and analytical sciences (AACN, 2015). Furthermore, this DNP essential underscores the importance of using science-based concepts to evaluate and enhance health care delivery and improve patient outcomes (AACN, 2015). Implementation of these nursing, evidence-based, scientific interventions and concepts proposals can only be possible and attainable when people have unfettered access to the basic healthcare services they need (AHRQ, 2011). Health and wellness, individual development of self-reliance and self-determination are essential needs (Hegge, 2013). However, when people in need of those services do not have the means of obtaining their healthcare needs, there should be a defined means of bringing healthcare services closer to where the people live (Hegge, 2013). As a result, the author's project findings and the clinical implications would be shared with policy makers of that community in the affected areas after completion. The use of holistic nursing approach that is about getting all the pertinent entities involved in the issues of interest will enhance health promotion and disease prevention (AACN, 2015). The initial goal of this project was to increase

awareness about the benefits of mobile health clinic (MHC). As shown in the project findings, despite the decreased awareness, 96% of the participants would use MHC if it was in their area.

The aspects that would need further consideration and interventions would be the additional lacking health services reported in the project findings.

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Appendix A
Matrix Evidence Table

Hill, C., Zurakowski, D., Bennet, J., Walker-White, R., Osman, J. L., Quarles, A., & Oriol, N. (2012). Knowledgeable Neighbors: A Mobile Clinic Model for Disease Prevention and Screening in Underserved Communities. <i>American Journal of Public Health, 102</i> (3), 406–410. https://doi.org/10.2105/AJPH.2011.300472				Grade Level of Evidence Strong recommendation; moderate-quality evidence (III)
Hypothesis/Questions	Design	Sample	Measurement	Results/Implications
Is the “know thy neighbor” model a feasible way of delivering healthcare to underserved neighborhoods in Boston?	Single-case study research	From 2006 to 2009 13,272 clients visited the Family Van (mobile health clinic).	After implementation of the Family Van client data was entered into an Access database.	Knowledgeable neighbor model works because it was found that during a time of medical need, one is most likely to call a family member first before calling 911. This implies that creating local resources would have an impact on the community
Taber, J. M., Leyva, B., & Persoskie, A. (2015). Why do people avoid medical care? A qualitative study using national data. <i>Journal of General Internal Medicine, 30</i> (3), 290–297. https://doi.org/10.1007/s11606-014-3089-1				Grade Level of Evidence Strong recommendation; moderate-quality evidence (IV)
To present comprehensive reasons and categories of why people avoid medical care	Qualitative study using data collected from a cross-sectional national survey	1,369 participants (40% male with a median age of 49)	None used. Independent research company coded the patient-generated responses to reasons why they avoided medical care.	Three main categories were identified for avoiding medical care: unfavorable evaluations of healthcare professionals, low perceived need for care, and traditional barriers to care like cost. Identifying possible causes is essential to

				implementing effective outreach programs.
Mallow, J. A., Theeke, L. A., Barnes, E. R., Whetsel, T., & Mallow, B. K. (2014). Using mHealth Tools to Improve Rural Diabetes Care Guided by the Chronic Care Model. <i>Online Journal of Rural Nursing & Health Care</i> , 14(1), 43-65. doi:10.14574/ojrnhc.v14i1.276				Grade Level of Evidence Strong recommendation; moderate-quality evidence (IV)
Hypothesis/Questions	Design	Sample	Measurement	Results/Implications
To assess the impact of telemedicine for individuals with diabetes in rural communities	Systematic review of the PubMed database from June-August 2012	Search yielded 23 articles that met inclusion criteria	None. Articles were further subdivided into categories of health systems, community resources, and self-mangement.	Telemedicine interventions such as the use of mobile apps were found to improve patient outcomes while being cost effective.
Kojima, N., Krupp, K., Ravi, K., Gowda, S., Jaykrishna, P., Leonardson-Placek, C., & Madhivanan, P. (2017). Implementing and sustaining a mobile medical clinic for prenatal care and sexually transmitted infection prevention in rural Mysore, India. <i>BMC Infectious Diseases</i> , 171-7. doi:10.1186/s12879-017-2282-3				Grade Level of Evidence Strong recommendation; moderate-quality evidence (IV)

<p>Implement a pilot program of mobile medical clinics in rural India and assess the impact of these clinics on the overall health of the community</p>	<p>Pilot program. Mobile clinics were built from 2008-2011 and the impact was assessed.</p>	<p>Two mobile clinics and one walk-in clinic that addressed prenatal care and STI prevention</p>	<p>700 community workers and 100 health care providers were trained.</p>	<p>During the program period over 15000 men and women were seen. The use of the clinics showed that quality healthcare could be provided at low costs.</p>
<p>Yu, S. Y., Hill, C., Ricks, M. L., Bennet, J., & Oriol, N. E. (2017). The scope and impact of mobile health clinics in the United States: a literature review. <i>International Journal for Equity in Health</i>, 161-12. doi:10.1186/s12939-017-0671-2</p>				<p>Grade Level of Evidence Strong recommendation; moderate-quality evidence (IV)</p>
<p>Hypothesis/Questions</p>	<p>Design</p>	<p>Sample</p>	<p>Measurement</p>	<p>Results/Implications</p>
<p>To challenge the notion that mobile health clinics as an alternative healthcare model but rather an integral part of the health care system</p>	<p>Systematic review</p>	<p>51 articles were found to meet the inclusion criteria after a search of the PubMed database from 1996-2016.</p>	<p>None. Themes were identified and the articles were divided accordingly. These themes include increasing healthcare access, improving health outcomes, reducing costs, and health care reform</p>	<p>It was found that mobile health clinics are a cost-effective model of healthcare delivery.</p>
<p>Flick, H., Barrett, S., & Carter-Hanson, C. (2016). Oral Health on Wheels: A Service Learning Project for Dental Hygiene Students. <i>Journal of Dental Hygiene</i>, 90(4), 226-233.</p>				<p>Grade Level of Evidence Strong recommendation; Low-quality evidence (VI)</p>

Investigate how alternative models of dental hygiene care delivery can reduce health care disparities	Survey that assessed healthcare provider satisfaction with clinical experience	Dental hygiene students (n=90) that completed service learning in mobile dental clinic.	Feedback survey that used the Likert scale to measure the students' awareness of underserved populations and clinical skills	94.4% of students indicated increased satisfaction and personal growth after working on the mobile clinic. Implications can be drawn on integrating the importance of reaching the underserved early in the curriculum.
Matthew-Maich, N., Harris, L., Ploeg, J., Markle-Reid, M., Valaitis, R., Ibrahim, S., Isaacs, S. (2016). Designing, Implementing, and Evaluating Mobile Health Technologies for Managing Chronic Conditions in Older Adults: A Scoping Review. <i>JMIR mHealth and uHealth</i> , 4(2), e29. https://doi.org/10.2196/mhealth.5127				Grade Level of Evidence Strong recommendation; moderate-quality evidence (IV)
Hypothesis/Questions	Design	Sample	Measurement	Results/Implications
To conduct a review of current mobile health clinics that support older adults with chronic conditions that are home bound	5-stage scoping review methodology that spanned from January 2005 to March 2015	42 articles were found that met the inclusion criteria.	No measures noted.	Found that there is a limited use of mobile health clinics for older adults due to barriers of implementation and lack of sustainability.
Chumbler, N. R., Quigley, P., Li, X., Morey, M., Rose, D., Sanford, J., Hoenig, H. (2012). Effects of Telerehabilitation on Physical Function and Disability for Stroke Patients: A Randomized, Controlled Trial. <i>Stroke</i> , 43(8), 2168–2174. https://doi.org/10.1161/STROKEAHA.111.646943				Grade Level of Evidence Strong recommendation; high-quality evidence (II)

To determine the effect of stroke tele-rehabilitation (including home visits) on physical function in veterans poststroke	Single-blind random control study	Participants aged 45-90 years old that experienced an ischemic or hemorrhagic stroke within two years (n=48).	Measurements were taken at baseline, 3 months and 6 months after intervention	The veterans that had tele-rehabilitation had significantly improved physical function when compared to the control group.
Rodriguez, K. L., Appelt, C. J., Young, A. J., & Fox, A. R. (2007). African American veterans' experiences with mobile geriatric care. <i>Journal of Health Care for the Poor and Underserved</i> , 18(1), 44-53. doi:10.1353/hpu.2007.0016				Grade Level of Evidence Strong recommendation; low-quality evidence (VI)
Hypothesis/Questions	Design	Sample	Measurement	Results/Implications
To explore various perspectives on the use of mobile geriatric units in low-income neighborhoods	Semi-structured interviews	Eighteen elderly African-American patients	Comparative analysis of the interviews yielded three main factors: quality of care, access, and ambience of the setting.	Analysis of the interviews revealed that mobile geriatric units are an acceptable form of primary care for this particular population.
Kyounghae, K., Choi, J. S., Eunsuk, C., Nieman, C. L., Jin Hui, J., Lin, F. R., & ... Hae-Ra, H. (2016). Effects of Community-Based Health Worker Interventions to Improve Chronic Disease Management and Care Among Vulnerable Populations: A Systematic Review. <i>American Journal Of Public Health</i> , 106(4), e3-e28. doi:10.2105/AJPH.2015.302987				Grade Level of Evidence Strong recommendation; moderate-quality evidence (IV)

<p>What type of interventions do community-based healthcare workers provide and what are the patient outcomes?</p>	<p>Systematic review</p>	<p>Reviewers found 61 studies that met inclusion criteria</p>	<p>Data was analyzed using a data extraction form developed by the author</p>	<p>Interventions by community-based health care workers were most effective in underserved communities where health disparities were the greatest.</p>
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Mobile Health Questionnaire

Please fill out this questionnaire completely. Thank you.

How would you rate the quality of services in this clinic?

1 2 3 4 5

Poor Exceptional

Please rate the waiting time you had in the clinic.

1 2 3 4 5

Minimal Excessive

How did you get here today? (Please circle)

Walk Marta

Car Bus

Taxi Bike

Other _____

Is this your first time at Luke's Place?

Yes | No

Do you know what a mobile health clinic is?

Yes | No

Do you use another facility besides Luke's Place for non-emergency healthcare? (e.g. urgent care, public health dept., primary care, etc.)

Yes | No

Have you ever used a mobile health service (e.g. dental, mammogram, or vision vans, etc.)?

Yes | No

If yes, please explain the experience

Mobile Health Questionnaire

Continued

What other services, if any, would you like to see offered at this clinic?

If a mobile health clinic came to your neighborhood would you use it?

Yes | No

Would it increase your use of healthcare services?

Yes | No

Demographics

Select your age group: [18-29] [30-49] [50-69] [70-89]

What is your gender: [Male] [Female]

Job status: [Employed] [Unemployed] [Retired]

What race/ethnicity best describes you? _____

Primary language spoken at home _____

Zip code _____

Please share any additional comments or suggestions.

Thank you for your time