

Qualitative And Mixed Methods Research: Underutilized Tools in Neuroscience Research Within the East African Context

Authors: Felix Njoroge¹ , Ruqiya Mahat¹ , Philip Mwachaka^{1,2} 

Affiliations:

1. University of Nairobi, Faculty of Health Sciences
2. Neurosurgery Department, Kenyatta National Hospital

Correspondence to: Felix Njoroge, Email: felixnjoroge6@gmail.com.

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Summary

Neuroscience, the intricate study of the nervous system, has traditionally relied heavily on quantitative research methods to decode the complexities of brain function, neural activity, and cognitive processes. However, the growing recognition of the limitations of purely quantitative approaches has led to an increasing appreciation for qualitative and mixed methods research globally (1). These approaches offer a richer, more nuanced understanding of the human brain, particularly when it comes to the investigation of experiences, behaviour, and societal impact. In the East African context, where cultural, social, and economic factors significantly influence health and disease, the application of these methodologies is particularly pertinent. This editorial article looks into the potential applications of qualitative and mixed methods research in neuroscience in East Africa, exploring how these methodologies can enrich our understanding of neuroscience.

Keywords: Qualitative, Quantitative, Mixed Methods, Neuroscience, East Africa

The Utility of Qualitative Methods in Neuroscience Research

Qualitative research focuses on understanding subjective experiences and the meanings that individuals attach to these experiences. Unlike quantitative research which prioritizes numerical data and statistical analysis, qualitative research seeks to explore the depth and complexity of human experiences. Methods such as interviews, focus groups, ethnography, and case studies are pivotal in this approach (2).

One significant potential application of qualitative research in East African neuroscience is in the study of neurological disorders. For instance, qualitative methods have been instrumental in understanding the lived experiences of individuals with conditions such as epilepsy, Parkinson's disease, and Alzheimer's disease (3). Through in-depth interviews and personal narratives, researchers gain insights into how these conditions affect patients' daily

lives, their coping mechanisms, and their interactions with caregivers and healthcare providers (4). This rich, contextual data is invaluable for developing patient-centred care strategies and improving the quality of life for individuals with neurological disorders.

Moreover, qualitative research has been crucial in exploring the psychosocial aspects of various neurological disorders

(5). By interviewing patients, families, and healthcare professionals, researchers can understand the emotional and social impacts of various neurological conditions. This approach helps in identifying the support systems and interventions needed to assist patients in their recovery journey, highlighting the importance of holistic care that addresses both physical and psychological needs.

The Utility of Mixed Methods Research in Neuroscience Research

Mixed methods research, which combines both qualitative and quantitative approaches, offers a comprehensive framework for studying complex phenomena in neuroscience. This integrative approach allows researchers to capitalize on the strengths of both methodologies, providing a more robust and multidimensional understanding of neurological and cognitive processes (6). Quantitative studies can answer the questions 'what' and 'how much' thereby making them suitable for establishing cause-and-effect relationships, and hypothesis testing as well as the assessment of knowledge, attitudes and practices of large populations; whereas qualitative studies can answer the questions 'why' and 'how' making them suitable for developing hypotheses and theories and describing processes (7). A

combination of the two methods therefore allows for a multidimensional understanding of various topics.

In clinical research, mixed methods are particularly valuable in evaluating the efficacy of new treatments and interventions for neurological disorders. Quantitative data from clinical trials can be enriched with qualitative feedback from patients about their experiences with the treatment. This holistic perspective ensures that the evaluation of treatment efficacy is not solely based on clinical outcomes but also considers patient satisfaction, quality of life, and adherence to treatment protocols. Such an approach is essential for developing treatments that are not only effective but also acceptable and feasible for patients (6).

Case Studies of the Implementation of Qualitative and Mixed Methods in Neuroscience Research in East African Contexts

1. Qualitative Research in Understanding Chronic Pain

Chronic pain is a pervasive issue that affects millions worldwide, and its subjective nature makes it a prime candidate for qualitative research. Traditional quantitative measures such as pain scales often fail to capture the full extent of the patient's experience. By employing qualitative methods, researchers can delve deeper into how chronic pain influences individuals' daily

lives, their emotional states, and their social interactions.

For instance, a study by Baum et al. among Somali pastoralists with chronic pain in Ethiopia using semi-structured and face-to-face interviews revealed the significant roles that social stigma, spirituality and stoicism play in the experience of chronic pain in that population. The pastoralists believed pain was a normal part of their harsh daily life and they'd therefore not normally seek

professional care unless the pain became very severe (8). These insights are critical for developing comprehensive pain management programs that address not only the physical aspects of pain but also its emotional and social determinants within such cultural contexts.

2. Mixed Methods Research in Cognitive Behavioral Therapy (CBT)

Cognitive Behavioral Therapy (CBT) is widely used for treating various mental health conditions, including anxiety and depression. A mixed methods approach can provide a comprehensive evaluation of CBT's effectiveness. Quantitative data from standardized assessments can be

combined with qualitative data from patient interviews to gain a holistic understanding of the therapy's impact.

For example, a mixed methods study by Dorsey et al. on the acceptability of trauma-focused CBT among guardians and children in Tanzania and Kenya involved quantitative standard questionnaires for the guardians which were followed by qualitative assessments of both the guardians and children to get deeper insights into the subject matter (9). Such a combined approach not only validates the quantitative findings but also provides deeper insights into the therapeutic process, enabling clinicians to tailor interventions more effectively to individual patient needs.

Practicalities and Limitations of Qualitative and Mixed Methods Research

While qualitative and mixed methods research offer significant advantages, they also come with practical challenges and limitations. One of the primary practicalities is the need for skilled researchers who are adept at both qualitative and quantitative methodologies (10). Training in qualitative data collection and analysis, such as conducting in-depth interviews and thematic coding, is therefore essential. Additionally, mixed methods research requires expertise in integrating and interpreting data from diverse sources, which can be time-consuming and resource-intensive.

To conduct a rigorous mixed methods study, investigators must carefully consider the timing, weight, and mixing of study elements (11). Timing refers to whether the quantitative and qualitative components occur simultaneously or sequentially. Sequential designs are useful when one method informs the other, such as using focus groups to enhance quantitative results. Simultaneous data collection is suitable when comparing qualitative and quantitative outcomes. The relative weight of each method is also crucial, with one approach often being

dominant, though sometimes both have equal weight. The choice of the dominant method depends on its strengths, limitations, and study objectives. Lastly, investigators need to decide how to mix the data, which can involve integrating the data during presentation or interpretation, embedding one type within the other, or connecting the data by having one method lead to the other (11).

Another practical consideration is the logistical challenge of conducting qualitative research in resource-limited settings. This includes securing funding, gaining access to diverse participant groups, and managing the ethical considerations associated with in-depth personal interviews. Researchers must be sensitive to cultural norms and ethical guidelines to ensure that participants are treated with respect and their privacy is maintained (12). Other limitations include the potential for researcher bias, difficulties in generalizing findings due to smaller sample sizes, and the complexity of data analysis (13).

Despite these challenges, the benefits of qualitative and mixed-methods research in

neuroscience are substantial. These methodologies provide a holistic understanding of the human experience,

which is particularly valuable in the culturally rich and diverse context of East Africa.

Conclusion

The incorporation of qualitative and mixed methods research into African neuroscience research would represent a significant shift towards a more holistic understanding of the nervous system and its functions. These methodologies provide invaluable insights into the subjective experiences and social contexts that shape neurological and cognitive processes, complementing the quantitative data that has traditionally dominated the field.

considering the integration of qualitative and mixed methods research can significantly enhance the depth and impact of your research work. The future of neuroscience research in Africa lies in the integration of diverse methodologies. These methodologies not only enrich our understanding of neurological conditions but also ensure that research findings are grounded in the lived experiences of patients and communities. By adopting these approaches, African neuroscientists can contribute to a more inclusive and comprehensive body of knowledge that better serves the needs of the region.

For the readers and authors of the East African Journal of Neurological Sciences,

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