Rwanda Public Health Bulletin

Vol. 6 (1); March 2025

Online ISSN: 2663-4651
Print ISSN: 2662-4643

HIGHLIGHTS

1. Support to Survivors of the 1994 Genocide against Tutsi for Recovery
2. Intimate Partner Violence & Mental Health
3. Nutrition Knowledge for Heart Disease Prevention
4. Employee Turnover in a Tertiary Hospital
5. Expanding Medical Training & Rural Healthcare in Rwanda

Ministry of Health

Rwanda Biomedical Centre
Healthy People, Wealthy Nation

Rwanda
Public Health Bulletin

General Information

Rwanda Public Health Bulletin (RPHB) is an open-access and peer-reviewed bulletin published by Rwanda Health Communication Centre (RHCC).

Its mission is to serve as a knowledge sharing platform for national and international public health scientific information. Content published under RPHB will be used to control and address potential public health outbreak threats and strengthen health systems through real time availability of information.

This will allow more and effective communication between policy makers, researchers and health practitioners.

A new issue is published quarterly with supplements and special reports. Publication materials are submitted online at https://www.rbc.gov.rw/publichealthbulletin/manuscripts/submission and should fulfil the RPHB's instructions.

Go to https://www.rbc.gov.rw/publichealthbulletin/about/instructions for instructions to authors.

Scientific scholars who would like to join RPHB and become peer reviewers are welcome. They can find more details at https://www.rbc.gov.rw/publichealthbulletin/about/reviewers

Publisher: Rwanda Health Communication Centre (RHCC).

Online ISSN: 2663 - 4651, **Print ISSN:** 2663 - 4643

Contacts

Email: rwandapublichealtbulletin@gmail.com
Website: https://www.rbc.gov.rw/publichealthbulletin/

Address

Rwanda Public Health Bulletin Secretariat
KG 203St., City of Kigali, Rwanda

Acknowledgement

This publication, [Rwanda Public Health Bulletin (RPHB)], was made possible by financial support from the Bloomberg Philanthropies Data for Health Initiative through the CDC Foundation. Its contents are solely the responsibility of the authors and don't necessarily represent the official views of Bloomberg Philanthropies, the CDC Foundation or the U.S. Centers for Disease Control and Prevention.

Bloomberg Philanthropies DATA FOR HEALTH INITIATIVE CDC Foundation Together our impact is greater

Rwanda
Public Health Bulletin

EDITORS

Rwanda
Public Health Bulletin

Dr. Jean Damascene Iyamuremye
Rwanda Biomedical Centre

Dr. Jean Nepomuscene Sindikubwabo
Rwanda Biomedical Centre

Hassan Mugabo
Rwanda Biomedical Centre

Rwanda
Public Health Bulletin

CONTENT

Dear readers,

I am pleased to introduce this publication of the Rwanda Public Health Bulletin (RPHB), which continues to serve as a vital platform for disseminating knowledge on public health challenges and their solutions in Rwanda and beyond.

As we commemorate the 31st anniversary of the 1994 genocide against the Tutsi, this publication is released in a deeply reflective period of 100 days of remembering the darkest chapter of Rwanda's history that left lasting scars across every corner of Rwandan society.

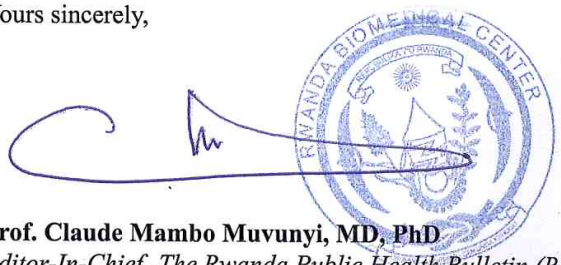
This publication features an article on the role of psychological support, social assistance, access to education, and healthcare in influencing evolution of post-traumatic stress disorder (PTSD) among survivors of the 1994 genocide against the Tutsi. This brings to light the lived experiences of survivors of the 1994 genocide against the Tutsi, not only in remembrance but also in recognition of the healing still underway. This publication indicates the complex interplay between mental health and broader social determinants. It highlights the healing potential of integrated psychological and socio-economic interventions, reminding us that recovery cannot happen in isolation. Psychotherapy, while essential, becomes significantly more effective when paired with social assistance, education, healthcare, and community-based support.
Another article in this publication exposes the far-reaching consequences of intimate partner violence on individuals with chronic mental disorders. The findings underscore how such violence not only compounds mental illness but directly hinders treatment adherence and increases relapse rates.

These papers remind us that while much progress has been made, our responsibility to support the mental, emotional, and social well-being of our population remains a vital national priority. The research in this bulletin challenges us to go even further to embrace a truly holistic approach that addresses not just clinical needs but the broader social and economic realities that shape mental health outcomes. In commemorating the 1994 genocide against the Tutsi each year, we do more than remember the past—we recommit ourselves to building a future anchored in unity, dignity, equity, and compassion. The articles in this publication echo this commitment by calling for integrated mental health services, gender-sensitive care, and sustained community engagement to ensure the well-being of all Rwandans and enhance positive mental health outcomes, easing the mental health burden, especially among the most vulnerable.

As we continue advancing toward universal health coverage and a more resilient, person-centered health system, this publication of RPHB serves as both a milestone and a roadmap, urging stakeholders to translate findings into tangible improvements for all Rwandans.

Let us continue to work together to build a Rwanda where healing is holistic, health is equitable, and no one is left behind.

Yours sincerely,



Prof. Claude Mambo Muvunyi, MD, PhD
Editor-In-Chief -The Rwanda Public Health Bulletin (RPHB)
Director General- The Rwanda Biomedical Center (RBC)

Original Research

Open Access

Beyond Psychotherapy: Addressing Socio-Economic and Psychological Needs in PTSD Recovery among Survivors of the 1994 Genocide against the Tutsi

Antoine Hagenimana[1], Samson Habimana[1,*], Gisele Gashugi[2], Therese Uwubutatu[1]

[1]*College of Medicine and Health Sciences (CMHS), University of Rwanda, Kigali, Rwanda.*
[2]*Mount Kigali University, School of Health Sciences, Kigali, Rwanda.*

***Corresponding author:**
Samson Habimana

Nyagatare District Hospital, Eastern Province, Rwanda
email: habimanasamson355@gmail.com

Received: June 24, 2024
Accepted: December 28, 2024
Published: March 31, 2025

Cite this article as: Hagenimana et al. Beyond Therapy: Addressing Socio-Economic and Psychological Needs in PTSD Recovery among Survivors of the 1994 Genocide against the Tutsi. *Rw. Public Health Bul. 2025. 6 (1): 7-15.* https://dx.doi.org/10.4314/rphb.v6i1.2

ABSTRACT

INTRODUCTION: Post-Traumatic Stress Disorder (PTSD) is a significant mental health concern, particularly among the survivors of the 1994 genocide against the Tutsi who were left with deep psychological and physical scars. This study aimed to explore perceptions regarding factors associated with the evolution of PTSD, focusing on the role of psychological support, socio-economic assistance, access to education, and healthcare.

METHODS: A mixed-methods research study was conducted, combining qualitative and quantitative approaches. The study was conducted in Kigali, Rwanda, on 20 survivors of the 1994 genocide against Tutsi aged 25-65 years who were beneficiaries of psychological support services and 10 mental health professionals from the Association of Genocide Widows Agahozo (AVEGA).

RESULTS: All respondents (100%) reported experiencing trauma-related symptoms, with commemoration events (40%), poverty (35%), and lack of social support (25%) identified as primary triggers. Psychological support combined with social assistance was the most effective intervention (60%), followed by access to education and healthcare (25%). Psychological support alone was less effective (20%). Survivors emphasized the importance of multidimensional interventions, including income-generating activities (IGA) and social assistance, in their recovery. Mental health professionals highlighted the challenges of treatment adherence and the need for holistic approaches addressing both psychological and socio-economic needs.

CONCLUSION: The study highlights the intricate link between psychological, social, and economic factors in the development of PTSD in genocide survivors, suggesting that multidimensional interventions, community-based support, economic stability, and social networks are more effective, and targed strategies should be reinforced to ease the PTSD burden among survivors of the 1994 genocide against Tutsi.

INTRODUCTION

Post-Traumatic Stress Disorder (PTSD) is a significant mental health concern, particularly among individuals who have experienced extreme violence and trauma [1,2]. In Rwanda, the 1994

Potential Conflicts of Interest: No potential conflicts of interest disclosed by all authors. **Academic Integrity:** All authors confirm their substantial academic contributions to development of this manuscript as defined by the International Committee of Medical Journal Editors. **Originality:** All authors confirm this manuscript as an original piece of work, and confirm that has not been published elsewhere. **Review:** All authors allow this manuscript to be peer-reviewed by independent reviewers in a double-blind review process. **Publisher:** Rwanda Health Communication Centre, KG 302st., Kigali-Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** https://rbc.gov.rw/publichealthbulletin/

genocide against the Tutsi population left deep psychological scars on survivors, many of whom continue to struggle with the long-term effects of their traumatic experiences [2,3]. PTSD prevalence rates among genocide survivors are alarmingly high, ranging between 29% and 79%, compared to a general population rate of 3.6% [2,4]. Despite the passage of time, the psychological impact of the 1994 genocide against the Tutsi remains profound, with over a quarter of survivors (25-26.8%) experiencing persistent symptoms such as flashbacks, severe anxiety, and emotional numbness, particularly during annual commemoration periods [3,5,6].

The Rwandan cultural context, which often discourages the open expression of emotions, further complicates the grieving and healing process. During the 1994 genocide against the Tutsi, traditional mourning practices were disrupted, leaving many survivors without the necessary social and emotional support to process their trauma [2]. This has led to a situation where PTSD symptoms are not only prevalent but also deeply entrenched, often exacerbated by ongoing socio-economic challenges such as poverty, lack of education, and inadequate access to healthcare [3,5,6,7].

While there have been numerous studies on PTSD prevalence and factors in the general population and survivors, there is still a gap in research focusing specifically on the evolution of PTSD among genocide survivors in Rwanda. Understanding the evolution and associated factors is crucial for developing effective interventions that address both the psychological and socio-economic needs of survivors. This study aims to fill this gap by exploring the various factors that influence the progression of PTSD among survivors of the 1994 genocide against Tutsi, with a particular focus on the role of psychological support, social assistance, access to education, and healthcare.

The study was conducted in collaboration with the Association of Genocide Widows Agahozo (AVEGA), an organization that provides psychological and social support to genocide survivors. By examining the experiences of survivors who have received support from AVEGA, this research seeks to identify the key factors that contribute to the evolution of PTSD and to provide insights into how these factors can be leveraged to improve mental health outcomes. The findings of this study have the potential to inform more holistic and effective interventions, not only for the survivors in Rwanda but also for other populations affected by large-scale violence and trauma.

METHODS

Study Design

This study employs a mixed-methods research design, combining both qualitative and quantitative approaches. The qualitative component allowed for an in-depth understanding of survivors' experiences and perceptions among survivors of the 1994 genocide against Tutsi, while the quantitative component provided descriptive data on reported PTSD symptoms, types of support received by survivors, and perceived factors influencing PTSD evolution among this population.

Study Area and Population

The study was conducted in Kigali, Rwanda, focusing on genocide survivors who are beneficiaries of AVEGA's mental health services, especially psychological and social support. The target population includes individuals who have experienced traumatic crises, particularly during the annual commemoration of the 1994 genocide against Tutsi. The study participants consisted of survivors and their children, aged between 25 and 65 years, who have been receiving psychological interventions at AVEGA. Additionally, 10 mental health professionals, including counselors and social workers from AVEGA, were included to provide insights into the therapeutic processes and challenges faced by survivors.

Sampling Technique

A purposive sampling technique was used to select participants for this study, ensuring that the sample includes survivors with varying degrees of PTSD severity and different socio-economic backgrounds. The inclusion criteria for survivors were: (1) having experienced trauma during the 1994 genocide and (2) being a beneficiary of AVEGA's psychological support services. Mental health professionals were selected based on their experience working with the survivors and their involvement in providing psychological support. This study included a sample of 20 survivors of the 1994 genocide against the Tutsi and 10 mental healthcare professionals obtained after saturation of answers.

Data Collection Methods

Data were collected using a combination of structured questionnaires and in-depth interviews from . The questionnaires were designed to gather demographic information, PTSD symptoms, the types of support received, and the perceived factors influencing PTSD outcomes among the survivors of the 1994 genocide against Tutsi. The in-depth interviews were conducted with both survivors and mental health professionals to explore their experiences and perceptions towards factors of PTSD evolution.

Structured Questionnaire: A standardized questionnaire was used to collect demographic data, including age, gender, marital status, education level, occupational status, and family support. The questionnaire also collected information on the PTSD symptoms experienced by survivors of the 1994 genocide against Tutsi. In addition, the questionnaire inquired about the type of support received, including psychological support, social assistance, income-generating activities (IGA), shelter, access to education, and healthcare. Finally, it inquired about perceptions of factors influencing PTSD evolution, such as psychological support, social assistance, and access to education and healthcare.

In-Depth Interviews: Semi-structured interview guides were used to explore survivors' experiences, challenges, and perceptions of factors influencing the PTSD evolution. The interviews focused on triggers of trauma, the impact of commemoration events, and the effectiveness of various interventions. A separate interview guide was used for mental health professionals to gather insights into the therapeutic processes, challenges faced by survivors, and the effectiveness of different interventions. Questions focused on treatment adherence, the role of socio-economic factors, and the need for holistic approaches.

Data Analysis

Data analysis was conducted using both quantitative methods, SPSS Version 26 (IBM, NY, USA), for statistical analysis, and qualitative methods, using NVivo 12 software (Lumivero, LLC, Denver, CO, USA). The quantitative data from the structured questionnaires were analyzed using descriptive statistics to summarize the demographic characteristics, PTSD symptoms, and types of support received by survivors. Frequencies, percentages, means, and standard deviations were calculated to describe the sample and the distribution of responses.

The qualitative data from in-depth interviews analyzed using thematic analysis. This involved coding the data to identify recurring themes and patterns related to PTSD triggers, the effectiveness of interventions, and survivors' perceptions of recovery. The coding process was conducted manually by two independent researchers to ensure reliability, and any discrepancies were resolved through discussion.

Ethical Considerations

The study received ethical approval from the University of Rwanda's Institutional Review Board (IRB) (Approval reference number: 378/CMHS IRB/2018). All participants were informed that their participation in the study was entirely voluntary and were free to withdraw from the study at any point without any negative consequences to the services they were receiving from AVEGA or any other organization. Written informed consent was obtained from all participants before data collection began, and the consent form was provided in both Kinyarwanda to ensure that participants fully understood the study's purpose, procedures, risks, and benefits. For participants who were illiterate, the consent form was read aloud, and verbal consent was obtained in the presence of a witness.

All data collected were anonymized to protect the identities of the participants. Names, addresses, and other identifying information were removed from the data, and participants were assigned unique identification codes. Care was taken to ensure confidentiality in reporting to ensure that no individual participant could be identified. Quotes from interviews were anonymized to prevent identification.

The research team adopted a trauma-informed approach throughout the study. This included being mindful of the potential for re-traumatization during interviews and ensuring that participants felt safe and supported at all times. Working closely with AVEGA, mental health professionals, not included in the study, were involved and put on standby to provide immediate support if participants experienced distress during the interviews. Then, after each interview, participants were offered a debriefing session to discuss their feelings and experiences. This was particularly important for survivors who might have been

triggered by the discussion of traumatic events. However, the research team took every precaution to minimize any potential harm to participants, and as much as possible, questions that could trigger severe emotional distress were avoided, and participants were assured of their right to skip any questions they found uncomfortable.

RESULTS

Characteristics of the respondents: We included 20 patients in total, and most respondents were female (80%). The age distribution shows that 50% of respondents were between 25-45 years old, while 30% were aged 46-55, and 20% were 56-65 years old. In terms of marital status, 50% of respondents were widowed, and 40% were single. The level of education varied, with 40% having completed secondary education and 20% pursuing university studies. The occupational status of respondents shows that 60% were unemployed. Only 25% were employed, and 15% were self-employed. Regarding family support, 35% lived with their children, while 20% lived alone (Table 1).

Reported PTSD Symptoms and Triggers: All respondents (100%) reported experiencing trauma-related symptoms, particularly during the annual genocide commemoration period. The primary triggers of trauma were commemoration events

Table 1: *Demographic Characteristics of Respondents (N=20)*

Category	Subcategory	Number of Respondents	Percentage (%)
Age	25-45 years	10	50%
	46-55 years	6	30%
	56-65 years	4	20%
Gender	Male	4	20%
	Female	16	80%
Marital Status	Single	8	40%
	Married	2	10%
	Widowed	10	50%
Level of Education	No formal education	3	15%
	Primary education	5	25%
	Secondary education	8	40%
	University education	4	20%
Occupational Status	Unemployed	12	60%
	Employed	5	25%
	Self-employed	3	15%
Family Support	Living with children	7	35%
	Living with parents	5	25%
	Living with relatives	4	20%
	Living alone	4	20%

Table 2: *Post-Traumatic Stress Disorder (PTSD) Symptoms and Triggers*

Category	Subcategory	Number of Respondents	Percentage (%)
Trauma Experience	Yes	20	100%
	No	0	0%
Triggers of Trauma	Commemoration events	8	40%
	Poverty	7	35%
	Lack of social support	5	25%

Table 3: *Types of Support Received by Survivors*

Type of Support	Number of Respondents	Percentage (%)
Psychological support only	4	20%
Psychological support combined with social assistance	12	60%
Psychological support combined with IGA	3	15%
Psychological support combined with shelter, IGA, and social assistance	7	35%
Access to education and healthcare	5	25%

(40%), poverty (35%), and lack of social support (25%) (Table 2).

Types of Support Received by Survivors: The most common form of support received by survivors of the 1994 genocide against Tutsi was psychological support combined with social assistance (60%), followed by psychological support combined with shelter, IGA, and social assistance (35%). Access to education and healthcare was reported by 25% of respondents. Only 20% of respondents received psychological support alone (Table 3).

Perceived factors leading to better PTSD outcomes: The most reported factor leading to recovery was psychological support combined with social assistance (60%), followed by access to education and healthcare (25%) and psychological support combined with IGA (15%). The results also show that psychological support alone (20%) is less effective in promoting recovery compared to combined interventions (Table 4).

The 1994 genocide against Tutsi survivors' experiences and perceptions toward the factors of PTSD

The qualitative data, gathered through in-depth interviews and observations, provided rich insights into the experience of the 1994 genocide against Tutsi survivors and their perceptions of PTSD outcomes.

Survivors reported that the annual genocide commemoration period triggered intense trauma symptoms, including flashbacks, severe anxiety, and emotional distress. One survivor, a 58-year-old widow, shared: *"During the commemoration period, I relive the horrors of 1994. I see my loved ones being killed, and I feel the same fear and helplessness. It takes weeks for me to recover each year."*

Survivors emphasized the importance of psychological support in helping them cope with trauma. However, they also noted that psychological support alone was insufficient. Another survivor stated: *"The counseling sessions help me manage my emotions, but when I return home to poverty and lack of shelter, the trauma feels overwhelming again.*"

Survivors also highlighted the critical role of social assistance, income-generating activities, and access to education and healthcare in their recovery. A 45-year-old survivor explained:

"The cow I received through Girinka program not only provides milk but also connects me with my neighbors. It has helped me feel less isolated and more hopeful about the future."

Healthcare professionals' perspectives on PTSD evolution among the 1994 genocide against Tutsi survivors.

Professionals noted that many survivors lack strong family or community support networks, which exacerbates their trauma. One counselor explained: *"Survivors often feel isolated because they have lost their families. Without a support*

Table 4: *Types of Support Influencing PTSD Evolution*

Factors Associated with PTSD Evolution	Number of Respondents	Percentage (%)
Psychological support	4	20%
Psychological support combined with social assistance	12	60%
Psychological support combined with IGA	3	15%
Access to education and healthcare	5	25%

system, it is difficult for them to adhere to treatment and recover fully." Professional 1

The breakdown of community cohesion was identified as a significant barrier to recovery. A social worker commented: *"In some communities, survivors are still stigmatized or misunderstood. This makes it hard for them to reintegrate and feel safe."* Professional 2

Professionals highlighted that ongoing socio-economic challenges, such as poverty and lack of education, act as maintaining factors for PTSD. One therapist stated: *"When survivors are struggling to meet their basic needs, it is almost impossible for them to focus on healing from trauma." Professional 3*

Treatment Adherence

The lack of adherence to treatment was identified as a major challenge. Professionals emphasized the need for interventions that address both psychological and socio-economic needs to improve treatment outcomes.

"We've seen a decrease in PTSD symptoms among clients over the past five years, largely due to psychological support. We help survivors reframe negative thoughts, build self-awareness, and develop coping strategies like self-control and self-care. However, multidimensional interventions—combining psychological support with socio-economic assistance—are crucial for long-term recovery and well-being." Professional 1

"Many clients don't initially recognize they have PTSD. During sessions, we uncover their psychological struggles, often triggered by socio-economic challenges like poverty or lack of education. While we provide counseling and psychotherapy, we also connect them with other services, such as housing or income-generating activities, to address their broader needs. This holistic approach improves treatment outcomes and fosters resilience." Professional 2

DISCUSSION

The study investigated the evolution of PTSD among genocide survivors in Rwanda and provided critical insights into the factors associated with the progression of PTSD and the effectiveness of various interventions. The findings highlight the complex interplay between psychological, social, and economic factors in shaping the mental health outcomes of survivors.

The study found that 100% of the respondents experienced trauma-related symptoms, particularly during the annual commemoration period. This is consistent with previous research that has shown high PTSD prevalence rates among survivors of the 1994 genocide against the Tutsi, ranging from 29% to 79% [11,12]. The annual commemoration events were identified as the primary trigger for trauma symptoms, followed by poverty and lack of social support. This aligns with previous research that noted that anniversaries of traumatic events often act as powerful reminders, exacerbating PTSD symptoms [6,11], and previous studies highlighting mental health crises during commemoration events in Rwanda [5,6]. The study also agrees with previous studies conducted in Rwanda, showing that socio-economic challenges, such as poverty and lack of education, significantly contribute to the persistence of PTSD symptoms among genocide survivors [3,13]. The lack of social support networks, as highlighted by the mental health professionals in the study, further underscores the importance of community cohesion in the recovery process.

Our study found that psychological support, when combined with social assistance, was the most effective intervention for reducing PTSD symptoms (60% of respondents reported this as a key factor). This is consistent with previous research by a previous systematic review that found that psychotherapy combined with socio-economic support led to better outcomes for PTSD sufferers [15]. However, the current study suggested that psychological support alone is insufficient for long-term recovery. This finding challenges the traditional focus on psychotherapy as the primary treatment for PTSD and calls for a more holistic approach that addresses both psychological and socio-economic needs. The importance of multidimensional interventions is further supported by the literature arguing that resilience after trauma is not just a psychological process but also involves social and economic factors [16,17,18]. We found that access to education and healthcare access was associated with better PTSD outcomes, aligning with another study showing that higher education, high income, and access to care improve PTSD outcomes [19]. This suggests that interventions aimed at improving socio-economic conditions in Rwanda, such as IGA and access to education, can play a crucial role in

reducing PTSD symptoms. This study highlighted the significant impact of socio-economic factors on the evolution of PTSD, and poverty was identified as a major trigger for trauma symptoms, with 35% of respondents citing it as a key factor. This is consistent with the findings of Darius et al. [20], who noted that poverty and lack of education act as maintaining factors for PTSD among genocide survivors. The study also found that survivors who received social assistance, such as shelter and IGA, reported better mental health outcomes. This supports the hypothesis that economic stability is a critical component of trauma recovery. The study's findings on the role of socioeconomic factors are further supported by Munyandamutsa et al. [12], who found that survivors who had access to economic resources were more likely to recover from PTSD. This suggests that interventions aimed at improving economic conditions, such as microfinance programs or vocational training, could be effective in reducing PTSD symptoms. The study also highlights the importance of IGA-based interventions, such as the Girinka program, which provides cows to survivors. This program not only improves economic conditions but also fosters social connections, which are critical for recovery.

The study identified treatment adherence as a major challenge in the recovery process. Many survivors missed scheduled clinical appointments and follow-ups, which led to relapses. This finding is consistent with a search showing that treatment adherence was a significant predictor of PTSD outcomes among genocide survivors [21,22]. The study suggests that interventions aimed at improving treatment adherence, such as reminders for medication and appointments, could improve outcomes. The study also highlighted the importance of patient-provider relationships in improving treatment adherence, aligning with Davison et al. [23], who found that a strong therapeutic alliance is critical for successful treatment outcomes. The finding that survivors who received combined interventions (psychological support and socio-economic assistance) had better outcomes suggests that a holistic approach to treatment is more effective than traditional psychotherapy alone.

The study's findings have important implications for policy and practice. First, they suggest that multidimensional interventions that combine psychological support with socio-economic assistance are more effective in reducing PTSD symptoms than traditional psychotherapy alone. This calls for a shift in mental health policy towards more holistic approaches that address both psychological and socio-economic needs. Second, the study highlights the importance of community-based interventions in the recovery process. This suggests that mental health services should be integrated into community development programs, such as the Girinka program, to improve outcomes for trauma survivors. Finally, the study underscores the importance of treatment adherence in recovery. This suggests that interventions aimed at improving treatment adherence, such as reminders for medication and appointments, should be incorporated into mental health services. While this study provides valuable insights into the evolution of PTSD among genocide survivors, it has several limitations. First, the small sample size (20 survivors and 10 professionals) limits the generalizability of the findings. A larger, more diverse sample would enhance the robustness of the results. Second, the cross-sectional design captures PTSD evolution at a single point in time, making it difficult to establish causal relationships between factors and PTSD outcomes. A longitudinal study would provide a clearer understanding of how PTSD evolves over time. Third, the study relied on self-reported data, which may be subject to recall bias, particularly given the traumatic nature of the events. Additionally, the focus on survivors receiving support from AVEGA may introduce selection bias, as those not accessing such services may have different experiences. Finally, the study was conducted in Kigali, which may not fully represent the experiences of survivors in rural areas. Future research should address these limitations to provide a more comprehensive understanding of PTSD among genocide survivors.

CONCLUSION

The findings of this study showed that psychological support combined with social assistance (60%), followed by access to education and healthcare and psychological support combined with IGA, were vital in improving PTSD outcomes among survivors of the 1994 genocide against Tutsi. The study challenges traditional approaches to PTSD treatment by suggesting that multidimensional interventions are more effective than psychotherapy

alone. These findings have important implications for policy and practice, calling for a shift towards more holistic approaches to mental health care. To reduce the burden of PTSD and the consequences of the 1994 genocide against Tutsi, the involvement of several actors is important and stakeholders, such as the survivors' associations (AVEGA, IBUKA, AERG, and GAERG), Ministry of Health and Ministry of Education should strengthen and improve continuous assistance given to the survivors.

The community and families of affected patients should provide more social support to the patients with PTSD. Interventions could include teaching patients how to use reminders to take medication and attend clinical appointments and how to strengthen the patient-provider relationship to improve treatment outcomes. Future research should explore the effectiveness of community-based interventions, economic stability, and social support networks in reducing PTSD symptoms.

REFERENCES

[1] R. Bradley, J. Greene, E. Russ, L. Dutra, and D. Westen, "A Multidimensional Meta-Analysis of Psychotherapy for PTSD," Am. J. Psychiatry, vol. 162, no. 2, pp. 214–227, Feb. 2005, doi: 10.1176/appi.ajp.162.2.214.

[2] C. Mutuyimana et al., "PTSD prevalence among resident mothers and their offspring in Rwanda 25 years after the 1994 genocide against the Tutsi," BMC Psychol., vol. 7, no. 1, p. 84, Dec. 2019, doi: 10.1186/s40359-019-0362-4.

[3] C. Musanabaganwa et al., "Burden of post-traumatic stress disorder in postgenocide Rwandan population following exposure to 1994 genocide against the Tutsi: A meta-analysis," J. Affect. Disord., vol. 275, pp. 7–13, Oct. 2020, doi: 10.1016/j.jad.2020.06.017.

[4] Y. Kayiteshonga, V. Sezibera, L. Mugabo, and J. D. Iyamuremye, "Prevalence of mental disorders, associated co-morbidities, health care knowledge and service utilization in Rwanda – towards a blueprint for promoting mental health care services in low- and middle-income countries?," BMC Public Health, vol. 22, no. 1, p. 1858, Oct. 2022, doi: 10.1186/s12889-022-14165-x.

[5] CNLG, "Kwibuka 25 25th commemoration of the genocide against the Tutsi," National Commission for the Fight against Genocide, 2019. [Online]. Available: http://kwibuka.rw/wp-content/uploads/2019/03/Kwibuka25_Booklet_English_Web.pdf?_t=1555320706

[6] D. Gishoma, J.-L. Brackelaire, N. Munyandamutsa, J. Mujawayezu, A. A. Mohand, and Y. Kayiteshonga, "Remembering and Re-Experiencing Trauma during Genocide Commemorations: The Effect of Supportive-Expressive Group Therapy in a Selected District Hospital in Rwanda," Rwanda J., vol. 2, no. 2, p. 46, Nov. 2015, doi: 10.4314/rj.v2i2.8F.

[7] A. Lordos, M. Ioannou, E. Rutembesa, S. Christoforou, E. Anastasiou, and T. Björgvinsson, "Societal Healing in Rwanda: Toward a Multisystemic Framework for Mental Health, Social Cohesion, and Sustainable Livelihoods among Survivors and Perpetrators of the Genocide against the Tutsi," Health Hum. Rights, vol. 23, no. 1, pp. 105–118, Jun. 2021.

[8] D. W. Russell, "UCLA Loneliness Scale (Version 3): Reliability, Validity, and Factor Structure," J. Pers. Assess., vol. 66, no. 1, pp. 20–40, Feb. 1996, doi: 10.1207/s15327752jpa6601_2.

[9] J. G. Beck et al., "The Impact of Event Scale-Revised: Psychometric properties in a sample of motor vehicle accident survivors," J. Anxiety Disord., vol. 22, no. 2, pp. 187–198, Jan. 2008, doi: 10.1016/j.janxdis.2007.02.007.

[10] D. Conybeare, E. Behar, A. Solomon, M. G. Newman, and T. D. Borkovec, "The PTSD Checklist—Civilian Version: Reliability, Validity, and Factor Structure in a Nonclinical Sample," J. Clin. Psychol., vol. 68, no. 6, pp. 699–713, Jun. 2012, doi: 10.1002/jclp.21845.

[11] L. C. Ng, N. Ahishakiye, D. E. Miller, and B. E. Meyerowitz, "Life After Genocide: Mental Health, Education, and Social Support of Orphaned Survivors," Int. Perspect. Psychol., vol. 4, no. 2, pp. 83–97, Apr. 2015, doi: 10.1037/ipp0000031.

[12] N. Munyandamutsa, P. Mahoro Nkubamugisha, M. Gex-Fabry, and A. Eytan, "Mental and physical health in Rwanda 14 years after the genocide," Soc. Psychiatry Psychiatr. Epidemiol., vol. 47, no. 11, pp. 1753–1761, Nov. 2012, doi: 10.1007/s00127-012-0494-9.

[13] S. Schaal, J.-P. Dusingizemungu, N. Jacob, and T. Elbert, "Rates of trauma spectrum disorders and risks of posttraumatic stress disorder in a sample of orphaned and widowed genocide survivors," Eur. J. Psychotraumatology, vol. 2, no. 1, p. 6343, Jan. 2011, doi: 10.3402/ejpt.v2i0.6343.

[14] C. D. Calhoun, K. J. Stone, A. R. Cobb, M. W. Patterson, C. K. Danielson, and J. J.

Bendezú, "The Role of Social Support in Coping with Psychological Trauma: An Integrated Biopsychosocial Model for Posttraumatic Stress Recovery," Psychiatr. Q., vol. 93, no. 4, pp. 949–970, Dec. 2022, doi: 10.1007/s11126-022-10003-w.

[15] W. Lan, B. Wang, G. Li, and J. Liu, "The Effectiveness of Psychotherapy on Posttraumatic Stress Disorder in Soldier: A Systematic Review," Int. J. Ment. Health Promot., vol. 26, no. 7, pp. 499–516, 2024, doi: 10.32604/ijmhp.2024.052309.

[16] G. A. Bonanno and E. D. Diminich, "Annual Research Review: Positive adjustment to adversity – trajectories of minimal–impact resilience and emergent resilience," J. Child Psychol. Psychiatry, vol. 54, no. 4, pp. 378–401, Apr. 2013, doi: 10.1111/jcpp.12021.

[17] M. Yıldırım, E. Seyrek, İ. H. Çelik, I. A. Aziz, and J. Gómez-Salgado, "The mediating roles of perceived social support and resilience in the relationship between earthquake anxiety and traumatic experiences among earthquake survivors in Turkey," Acta Psychol. (Amst.), vol. 253, p. 104714, Mar. 2025, doi: 10.1016/j.actpsy.2025.104714.

[18] B. M. Iacoviello and D. S. Charney, "Psychosocial facets of resilience: implications for preventing posttrauma psychopathology, treating trauma survivors, and enhancing community resilience," Eur. J. Psychotraumatology, vol. 5, no. 1, p. 23970, Dec. 2014, doi: 10.3402/ejpt.v5.23970.

[19] K. Naghdi et al., "The association between the outcomes of trauma education and some socio-economic indicators: a descriptive-analytical study," Arch. Trauma Res., no. Online First, Jun. 2023, doi: 10.48307/atr.2023.175293.

[20] D. Gishoma, J.-L. Brackelaire, N. Munyandamutsa, J. Mujawayezu, A. A. Mohand, and Y. Kayiteshonga, "Supportive-Expressive Group Therapy for People Experiencing Collective Traumatic Crisis During the Genocide Commemoration Period in Rwanda: Impact and Implications," J. Soc. Polit. Psychol., vol. 2, no. 1, pp. 469–488, Aug. 2014, doi: 10.5964/jspp.v2i1.292.

[21] I. M. Kronish, D. Edmondson, Y. Li, and B. E. Cohen, "Post-traumatic stress disorder and medication adherence: Results from the Mind Your Heart Study," J. Psychiatr. Res., vol. 46, no. 12, pp. 1595–1599, Dec. 2012, doi: 10.1016/j.jpsychires.2012.06.011.

[22] K. S. Barawi, C. Lewis, N. Simon, and J. I. Bisson, "A systematic review of factors associated with outcome of psychological treatments for post-traumatic stress disorder," Eur. J. Psychotraumatology, vol. 11, no. 1, p. 1774240, Dec. 2020, doi: 10.1080/20008198.2020.1774240.

[23] G. C. Davison and J. M. Neale, Abnormal psychology, Rev. 6th ed. New York Chichester: Wiley, 1996.

Original Research

Open Access

Intimate partner violence prevalence and its effect on medication adherence and relapses among patients with chronic mental disorders at Ndera Neuropsychiatric Hospital, Kigali, Rwanda

Jeannette Nyirabahizi[1], Samson Habimana[2,*], Janvier Yubahwe[1], Jean Pierre Gafaranga[2], Bizoza Rutakayire[1]

[1]*University of Rwanda, College of Medicine and Health Sciences, Kigali, Rwanda.*
[2]*Nyagatare District Hospital, Eastern Province, Rwanda.*
[3]*University Teaching Hospital Of Kigali, Kigali, Rwanda.*
[4]*Ndera Neuropsychiatrisc Hospital, Kigali, Rwanda.*

***Corresponding author:**
Samson Habimana

Nyagatare District Hospital, Eastern Province, Rwanda
email: habimanasamson355@gmail.com

Received: June 24, 2024
Accepted: December 28, 2024
Published: March 31, 2025

Cite this article as: Nyirabahizi et al. Intimate partner violence prevalence and its effect on medication adherence and relapses among patients with chronic mental disorders at Ndera Neuropsychiatric Hospital, Kigali, Rwanda, 2022. *Rw. Public Health Bul. 2025. 6 (1): 16-23.* https://dx.doi.org/10.4314/rphb.v6i1.1

ABSTRACT

INTRODUCTION: Intimate Partner Violence (IPV) is a global public health issue with severe consequences, particularly for individuals with chronic mental disorders. This study aimed to assess the prevalence of IPV among patients with chronic mental disorders at Ndera Neuropsychiatric Hospital in Rwanda and examine its impact on medication adherence and relapse rates.

METHODS: A cross-sectional study was conducted with 384 adult patients diagnosed with chronic mental disorders. Participants were screened for IPV using the Hurt, Insult, Threaten, Scream (HITS) tool, while medication adherence was assessed using the Medication Adherence Rating Scale (MARS). Relapse rates were determined through a retrospective review of medical records. Descriptive and inferential statistics, including logistic regression, were used for data analysis.

RESULTS: The prevalence of IPV among participants was 28%, with women more affected than men (40.6% vs. 10.6%). Poor medication adherence was reported by 32% of participants, and 51% had at least one relapse in the past 12 months. Patients experiencing IPV were 2.8 times more likely to be non-adherent to medications (OR=2.85; 95% CI: 1.74-4.65; p<0.001) and 3.48 times more likely to relapse (OR=3.48; 95% CI: 2.14-5.65; p<0.001).

CONCLUSION: The study highlights the high prevalence of IPV among individuals with chronic mental disorders, particularly women, and its detrimental effects on treatment outcomes. Integrated interventions addressing IPV and mental health, alongside gender-sensitive policies and community support programs, are urgently needed to improve medication adherence and reduce relapse rates in this vulnerable population.

INTRODUCTION

Intimate Partner Violence (IPV) is a significant global public health concern and a serious violation of human rights [1]. It encompasses physical, sexual, psychological, and economic abuse perpetrated by a current or former intimate partner. IPV affects individuals across all demographics, with women disproportionately affected, leading to severe health consequences, including mental

health disorders, poor medication adherence, and increased risk of disease relapses [1,2].

The World Health Organization (WHO) defines violence as "the intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that results in or has a high likelihood of resulting in injury, death, psychological harm, or deprivation" [2]. IPV, as a subset of interpersonal violence, has been recognized as a critical public health issue requiring urgent intervention from national and international health agencies [3]. Research indicates that IPV is highly prevalent across both high-income and low-income countries, contributing to a broad range of adverse mental health outcomes, including depression, anxiety disorders, post-traumatic stress disorder (PTSD), substance abuse, and suicidal ideation [4].

Among individuals with chronic mental disorders, IPV is particularly detrimental as it exacerbates symptoms, disrupts treatment adherence, and increases the likelihood of relapse [5]. Medication adherence is a cornerstone of effective psychiatric treatment, yet many individuals experiencing IPV face barriers to maintaining their treatment regimen [5]. These barriers include coercion by an abusive partner, psychological distress, financial constraints, and stigma. Consequently, poor medication adherence leads to worsening symptoms, increased hospitalization rates, and higher healthcare costs [5,6].

Several studies have established a strong association between IPV and negative mental health outcomes. For example, evidence suggests that individuals who experience IPV have higher rates of non-adherence to psychiatric medications and are more likely to suffer relapses due to inadequate treatment management [5,7]. The effects of IPV on mental health are compounded by socioeconomic factors such as poverty, unemployment, and limited access to healthcare, which further hinder adherence to treatment and overall well-being [8].

This study aimed to assess the prevalence of IPV among patients with chronic mental disorders receiving care at Ndera Neuropsychiatric Hospital. It also sought to examine the impact of IPV on medication adherence and the frequency of relapses within this population. By identifying these associations, the study intends to inform interventions that improve the management of mental health conditions in IPV-affected individuals and advocate for policies that enhance protection and support for this vulnerable population.

METHODS

Study Design

This study employed a cross-sectional design to assess the prevalence of IPV and its effects on medication adherence and relapse rates among patients with chronic mental disorders at Ndera Neuropsychiatric Hospital.

Study Setting

The research was conducted at Ndera Neuropsychiatric Teaching Hospital, Kigali, Rwanda, a leading neuropsychiatric hospital in Kigali, Rwanda. Founded by the Congregation of the Brothers of Charity in 1951, the hospital serves as a referral center for patients with mental health disorders in Rwanda.

Study Population

Participants included adult patients (aged 18 and above) with diagnosed chronic mental disorders who had been on psychiatric medication for at least 12 months. Eligible participants had to have a current or former intimate partner and the cognitive ability to understand the study procedures and provide informed consent. We excluded participants with cognitive impairments or severe mental health conditions, those on medication for less than 12 months, and those aged under 18.

Sample Size and Sampling: The required sample size was calculated using the standard formula for prevalence studies, with an estimated IPV prevalence of 50%, a 95% confidence interval, and a margin of error of 5%, yielding a sample size of 384 participants. Convenience sampling was used to recruit participants from outpatient and inpatient settings at Ndera Neuropsychiatric Hospital.

Data Collection

A structured questionnaire was used to collect data on IPV, medication adherence, and relapse history. IPV was screened using the Hurt, Insult, Threaten, Scream (HITS) tool [9], while medication adherence was assessed using the Medication Adherence Rating Scale (MARS) [10]. Relapse rates were determined through a retrospective review of medical records covering the previous 12 months.

Data Analysis

Data were entered into EpiData 3.1 and analyzed using Stata version 13. Descriptive statistics were used to calculate prevalence rates, while inferential statistics, including Chi-square tests and logistic regression, were employed to determine associations between IPV, medication adherence, and relapse rates. A p-value of <0.05 was considered statistically significant.

Ethical Considerations

Ethical approval for this study was obtained from the Institutional Review Board (IRB) of the College of Medicine and Health Sciences, University of Rwanda (Ref: 266/CMHS IRB/2022), and the Ethics Committee of Ndera Neuropsychiatric Hospital (Ref: 031/CNEC/2022).

The study adhered to the ethical principles outlined in the Declaration of Helsinki, ensuring the protection of participants' rights, dignity, and well-being. Prior to participation, all participants were provided with detailed information about the study's purpose, procedures, potential risks, and benefits. Informed consent was obtained in writing from each participant. Participants were informed that they could withdraw from the study at any time without any negative consequences to their ongoing care or treatment. To protect participants' privacy, all data were de-identified before analysis. Unique codes were assigned to each participant, and no personally identifiable information (e.g., names, addresses, or hospital identification numbers) was collected or stored.

Given the sensitive nature of IPV and the vulnerability of participants with chronic mental disorders, special care was taken to ensure that the study did not cause additional harm or distress. Trained mental health professionals were available throughout the study to provide immediate support to participants who experienced emotional distress or disclosed ongoing abuse. Participants who disclosed experiencing IPV were provided with information about available resources, including hotlines, counseling services, and legal support.

RESULTS

A total of 384 patients diagnosed with mental disorders and followed at Ndera Neuro-Psychiatric Hospital were included. Among the participants, fifty-eight percent (58%) were females, and 42% were males. About 19% of the study participants reported having ever been physically hit by their partners, 56% of all study participants reported to have ever been insulted or talked down by their partners, 36% reported to have ever been threatened with harm by their partners, 40% of the participants reported that their partners screamed or cursed at them and 30% reported to have been forced to do sexual acts that they were not comfortable with (Table 1).

Table 1: *Results of the screening of IPV using the HITS tool in patients with mental disorders*

Component	Number	Percentage
Physically hit		
Never	311	80.99
Rarely	30	7.81
Sometimes	31	8.07
Fairly	12	3.13
Frequently	0	0.0
Insulted or talked down		
Never	169	44.01
Rarely	73	19.01
Sometimes	110	28.65
Fairly	26	6.77
Frequently	6	1.56
Threatened with harm		
Never	246	64.06
Rarely	67	17.45
Sometimes	55	14.32
Fairly	15	3.91
Frequently	1	0.26
Screamed or cursed		
Never	229	59.64
Rarely	67	17.45
Sometimes	75	19.53
Fairly	13	3.39
Frequently	0	0.0
Forced to do sexual acts that they were not comfortable with		
Never	268	69.79
Rarely	33	8.59
Sometimes	66	17.19
Fairly	15	3.91
Frequently	2	0.52

Table 2. *The prevalence of IPV among study participants*

HITS score results	n	%
Total score		
Median (Q1-Q3)	6 (5-11)	
Prevalence of IPV		
IPV (Score >10)	108	28.12
No IPV (Score ≤10)	276	71.88

n: Frequency; %: Percentage; IPV: Intimate partner violence; HITS: Hurt, Insult, Threaten, Scream

Table 3. *Prevalence of IPV per gender category*

Gender	Presence of IPV		Total
	Yes	No	
Male	17 (10.63%)	143 (89.38%)	160 (41.67%)
Female	91 (40.63%)	133 (59.38%)	224 (58.33%)

IPV: Intimate partner violance

Considering the results of the screening done using the HITS tool, where patients who scored greater than 10 were considered to have IPV, the prevalence of IPV among patients diagnosed with mental illness was found to be 28% (Table 2). Considering the prevalence of IPV across genders, 10.6% of male participants were found to have IPV, while 40.6% of female participants were found to have IPV (Table 3).

Regarding the results of screening of medication adherence using the MARS, 51% of the patients reported that they forget to take their medications, 27.6% reported being careless at the time of taking medications, 30% of the participants reported to stop medications when they are feeling better, 46.6% stop medications when they are not feeling well and 16.9% take medications only when they are sick. Eighty-five percent of the participants reported that their thoughts are clear when they are on mediations, while 77% reported that staying on their medications can prevent them from getting sick (Table 4).

The median Medication Adherence Rating Scale score among our study participants was 8, and 32.0% of patients had poor adherence to their medications, and 67.9% were adherent to their medications. Fifty-one percent of the study participants reported a positive history of relapse in the past 12 months, where 33.8% of them had more than one relapse in those 12 months (Table 5).

Table 4. *Screening of medication adherence and reasons*

Attitude	Number	%
Forget to take medications		
Yes	196	51.04
No	188	48.96
Careless at times of taking medications		
Yes	106	27.60
No	278	72.40
Stop medications when feeling better		
Yes	115	29.95
No	269	70.05
Sometimes stop medication when not feeling well		
Yes	179	46.61
No	205	53.39
Only take medications when sick		
Yes	65	16.93
No	319	83.07
It is not natural for my body and my mind to be controlled by medications		
Yes	43	11.20
No	341	88.80
My thoughts are clear on medications		
Yes	327	85.38
No	56	14.62
By staying on medications, I can prevent from getting sick		
Yes	296	77.08
No	88	22.92
I feel weird, like a zombie on medications		
Yes	16	4.17
No	368	95.83
Medications make me feel tired and sluggish		
Yes	157	40.89
No	227	59.11

Table 6 shows that there are significant associations ($p<0.05$) between IPV, Adherence, Relapses, and Gender. Patients with IPV were 2.8 times more likely to be non-adherent to medications and 3.5

Table 5: *Medication adherence and disease relapses*

Variable	Number (n=384)	Percentage (%)
Non-adherent	123	32.03
Adherent	261	67.97
Total MARS Score (Median, IQR)	9 (7–10)	–
Relapses in Past 12 Months		
Yes	196	51.05
No	188	48.96
Number of Relapses (n=196)		
One relapse	129	66.15
More than one relapse	66	33.85

IQR: Interquartile range; MARS: Medication Adherence Rating Scale

Table 6: *Associations Between IPV, adherence, relapses, and gender*

Adherence to medications	Non-adherent	Adherent	OR (95% CI)	p-value
Patients with IPV	43 (39.81%)	65 (60.19%)	2.85 (1.74-4.65)	<0.001
Patients without IPV	52 (18.84%)	224 (81.16%)	Ref	
Relapses in the past 12 months	Yes	No		
Patients with IPV	78 (72.22%)	30 (27.78%)	3.48 (2.14-5.65)	<0.001
Patients without IPV	118 (42.75%)	158(57.25%)	Ref	
Experienced IPV	Yes	No		
Female	91 (40.63%)	133 (59.38%)	5.75 (3.26-10.17)	<0.001
Male	17 (10.63%)	143 (89.38%)	Ref	

MARS: CI: Confidence interval; Medication Adherence Rating Scale; OR: Odd ratio; p<0.05: Statistically significant

times more likely to relapse compared to those without IPV. Female patients were 5.7 times more likely to experience IPV than males.

DISCUSSION

The findings revealed a high prevalence of IPV among people with chronic mental health diseases, with women being significantly more affected than men. Furthermore, IPV was strongly associated with poor medication adherence and increased relapse rates. These results align with previous research but also offer new perspectives on the interplay between IPV, mental health, and treatment outcomes.

The study found that 28% of participants experienced IPV, which is consistent with global estimates but varies significantly across different regions and populations. For instance, the World Health Organization (WHO) reports that 23-56% of women worldwide experience either physical or sexual violence from an intimate partner [11]. However, the prevalence in this study is lower than the 53% reported in Ethiopia and higher than the rates found in Japan [12]. This variation can be attributed to cultural, socioeconomic, and legal differences across countries. In Rwanda, the relatively high prevalence of IPV may be influenced by traditional gender norms and the aftermath of the 1994 genocide, which has left lasting scars on the social fabric, including gender relations [3].

The study also highlights a significant gender disparity, with women being 5.75 times more likely to experience IPV than men. This finding is consistent with global trends, where women are disproportionately affected by IPV due to entrenched gender inequalities and power imbalances [1-4]. However, the study's focus on a psychiatric population adds a layer of complexity, as mental health disorders can exacerbate vulnerability to IPV. For example, individuals

with chronic mental illnesses may have impaired judgment, reduced social support, and limited ability to advocate for themselves, making them more susceptible to abuse [5].

The study found that patients who experienced IPV were 2.8 times more likely to be non-adherent to their medications compared to those who did not experience IPV. This finding is consistent with previous research that has established a strong link between IPV and poor medication adherence [6], [13]. The mechanisms underlying this association are multifaceted. IPV can lead to psychological distress, which may impair a patient's ability to adhere to their treatment regimen. Additionally, abusive partners may actively interfere with medication adherence by withholding medications or discouraging their use as a form of control [7]. A previous study conducted at Ndera Neuropsychiatric Hospital aligns with our findings and showed that among individuals with mental illnesses, there is a significant correlation between IPV and medication adherence; those who experienced IPV were 2.8 times more likely than those who did not take their prescriptions as prescribed (OR=2.85; 95% CI: 1.74-4.65; p<0.001) [14]. However, the study's results differ from those of Sehgal et al. [15], who found no significant difference in medication adherence between women with and without IPV. This discrepancy may be due to differences in study populations and methodologies. Sehgal et al. [15] focused on women with mental illness in South India, where cultural factors and healthcare access may play a more significant role in medication adherence than IPV. In contrast, the Rwandan study [14] included both men and women, suggesting that the impact of IPV on medication adherence may be more pronounced in certain populations or contexts.

Our study also found that patients who experienced IPV were 3.48 times more likely to have relapses in the past 12 months compared to those who did not experience IPV. This finding is consistent with previous research that has linked IPV to increased relapse rates in patients with mental health disorders [1,12]. In Rwanda, a previous study showed that the odds of relapses in the previous 12 months were 3.48 for patients with IPV and 2.14-5.65 for those without IPV (OR=3.48; 95% CI: 2.14-5.65; p<0.001) [14].

IPV can exacerbate symptoms of mental illness, leading to a vicious cycle of abuse and worsening mental health. For example, the chronic stress associated with IPV can trigger episodes of depression, anxiety, or psychosis, which may result in hospitalization or other forms of acute care [5]. Our findings suggest that IPV may also indirectly contribute to relapse by undermining medication adherence. Poor adherence to psychiatric medications is a well-established risk factor for relapse, and the study's results indicate that IPV is a significant barrier to adherence. This dual impact of IPV—directly exacerbating symptoms and indirectly undermining treatment—underscores the need for integrated interventions that address both IPV and mental health.

We found that women are 5.75 times more likely to experience IPV than men, which is consistent with a previous study in Rwanda and global trends [3,14,16], but it also raises important questions about the intersection of gender, mental health, and IPV. Women with mental health disorders may be particularly vulnerable to IPV due to societal stigma, economic dependence, and limited access to resources [4]. Additionally, our findings suggest that IPV may have a more pronounced impact on women's mental health, as evidenced by the higher rates of relapse and poor medication adherence among female participants. This gender disparity highlights the need for gender-sensitive interventions that address the unique challenges faced by women with mental health disorders. For example, interventions could include economic empowerment programs, legal support, and counseling services tailored to the needs of women experiencing IPV [17,18]. Additionally, healthcare providers should be trained to recognize the signs of IPV and provide appropriate referrals and support. Social support interventions are also needed as patients with strong social support networks may be better able to adhere to their medications despite experiencing IPV. Community-based programs that promote gender equality and provide support for victims of IPV may help reduce the prevalence of IPV and its associated mental health consequences [17,19]. Future research could evaluate the effectiveness of such interventions in improving medication adherence and reducing relapse rates among patients with chronic mental disorders.

This study has some limitations to consider. First, its cross-sectional design limits the ability to establish causal relationships between IPV, medication adherence, and relapses. Second, reliance on self-reported data may introduce

recall bias, particularly for sensitive topics like IPV. Third, the use of convenience sampling may limit the generalizability of findings to other populations or settings. Fourth, the study did not explore the role of socioeconomic factors, such as income or education, which could influence IPV and medication adherence. Finally, the focus on a single psychiatric hospital in Rwanda may not reflect the experiences of individuals in other regions or healthcare systems. Therefore, further extensive longitudinal studies addressing these limitations would help better inform strategies to ease the IPV burden among this population.

CONCLUSION

This study provides valuable insights into the prevalence of IPV among patients with chronic mental disorders and its impact on medication adherence and relapse rates. The findings highlight a high prevalence of IPV among individuals with chronic mental health disorders, disproportionally affecting more women and associated with poor medication adherence and high relapses. The findings suggest the need for integrated interventions that address both IPV and mental health, particularly for women who are disproportionately affected by IPV. Health providers have to consider regular screening of IPV in patients with mental disorders during their routine psychiatric consultations for holistic care. Families of affected individuals should help them take medication at home. Local authorities may also contribute by enhancing the awareness of gender equity and equality in the general population to reduce the burden of IPV on women, particularly those with mental disorders in their families. Finally, policymakers have to elaborate and reinforce policies on protecting patients with mental disorders against IPV by enacting targeted policies and strategies to eliminate IPV among the affected populations.

REFERENCES

[1] T. O. Afe, T. C. Emedoh, O. Ogunsemi, and A. A. Adegbohun, "Intimate partner violence, psychopathology and the women with schizophrenia in an outpatient clinic South-South, Nigeria," BMC Psychiatry, pp. 1–8, 2016, doi: 10.1186/s12888-016-0898-2.

[2] T. Abramsky et al., "What factors are associated with recent intimate partner violence? findings from the WHO multi-country study on women's health and domestic violence," BMC Public Health, vol. 11, no. 1, p. 109, Dec. 2011, doi: 10.1186/1471-2458-11-109.

[3] C. Bahati, J. Izabayo, P. Munezero, J. Niyonsenga, and L. Mutesa, "Trends and correlates of intimate partner violence (IPV) victimization in Rwanda: results from the 2015 and 2020 Rwanda Demographic Health Survey (RDHS 2015 and 2020)," BMC Womens Health, vol. 22, no. 1, p. 368, Sep. 2022, doi: 10.1186/s12905-022-01951-3.

[4] J. K. Stockman, H. Hayashi, and J. C. Campbell, "Intimate Partner Violence and Its Health Impact on Ethnic Minority Women," J. Womens Health, vol. 24, no. 1, pp. 62–79, Jan. 2015, doi: 10.1089/jwh.2014.4879.

[5] M. Chmielowska and D. C. Fuhr, "Intimate partner violence and mental ill health among global populations of Indigenous women : a systematic review," Soc. Psychiatry Psychiatr. Epidemiol., vol. 52, no. 6, pp. 689–704, 2017, doi: 10.1007/s00127-017-1375-z.

[6] M. H. Al Maqbali, M. R. Almashrafi, K. A. Alrisi, M. H. Albreiki, W. M. Asiri, and A. S. Aljaradi, "Non-adherence to medications among patients with mental disorders attending tertiary care in Oman," Int. J. Community Med. Public Health, vol. 9, no. 2, p. 642, Jan. 2022, doi: 10.18203/2394-6040.ijcmph20220221.

[7] R. Mason and S. E. O'Rinn, "Co-occurring intimate partner violence, mental health, and substance use problems: a scoping review," Glob. Health Action, vol. 7, p. 24815, 2014, doi: 10.3402/gha.v7.24815.

[8] T. Eticha, A. Teklu, D. Ali, G. Solomon, and A. Alemayehu, "Factors Associated with Medication Adherence among Patients with Schizophrenia in Mekelle, Northern Ethiopia," PLOS ONE, vol. 10, no. 3, p. e0120560, Mar. 2015, doi: 10.1371/journal.pone.0120560.

[9] C. Chan, Y. Chan, A. Au, and G. Cheung, "Reliability and Validity of the 'Extended □ Hurt, Insult, Threaten, Scream' (E□Hits) Screening Tool in Detecting Intimate Partner Violence in Hospital Emergency Departments in Hong Kong," Hong Kong J. Emerg. Med., vol. 17, no. 2, pp. 109–117, Apr. 2010, doi: 10.1177/102490791001700202.

[10] A. H. Y. Chan, R. Horne, M. Hankins, and C. Chisari, "The Medication Adherence Report Scale: A measurement tool for eliciting patients'

reports of nonadherence," Br. J. Clin. Pharmacol., vol. 86, no. 7, pp. 1281–1288, Jul. 2020, doi: 10.1111/bcp.14193.
[11] World Health Organisation, "Understanding and addressing violence against women: Intimate Partner Violence," 2015. doi: 10.1016/B978-0-08-097086-8.35026-7.
[12] N. Stewart E, Donna; MacMillan, Harriet; Wathen, "Intimate Partner Violence," Can. J. Psychiatry, vol. 58, no. 6, 2013, doi: 10.1177/070674371305800601.
[13] B. C. Biomndo, A. Bergmann, N. Lahmann, and L. Atwoli, "Intimate partner violence is a barrier to antiretroviral therapy adherence among HIV-positive women: Evidence from government facilities in Kenya," PloS One, vol. 16, no. 4, p. e0249813, 2021, doi: 10.1371/journal.pone.0249813.
[14] J. Nyirabahizi, "Intimate partner violence prevalence and its effect on medication adherence and relapses among patients with chronic mental disorders at ndera neuropsychiatric hospital," University of Rwanda, 2022. [Online]. Available: https://dr.ur.ac.rw/bitstream/handle/123456789/2178/Dr.%20Jeannette%20NYIRABAHIZI.pdf?sequence=1&isAllowed=y
[15] U. Sehgal, apoorva., Jhanwar bharat., Gilhotra.K, "Severity of domestic abuse and its relationship with distress tolerance and medication adherence in women with mental illness in South India," Arch. Anesthesiol. Crit. Care, vol. 4, no. 4, pp. 527–534, 2018.
[16] L. Gilbert et al., "Feasibility and preliminary effects of a screening, brief intervention and referral to treatment model to address gender-based violence among women who use drugs in Kyrgyzstan: Project WINGS (Women Initiating New Goals of Safety): WINGS: an IPV SBIRT model," Drug Alcohol Rev., vol. 36, no. 1, pp. 125–133, Jan. 2017, doi: 10.1111/dar.12437.
[17] O. Mercier et al., "Interventions for intimate partner violence during the perinatal period: A scoping review," Campbell Syst. Rev., vol. 20, no. 3, p. e1423, Sep. 2024, doi: 10.1002/cl2.1423.
[18] J. Nabayinda et al., "The impact of an economic empowerment intervention on intimate partner violence among women engaged in sex work in southern Uganda: A cluster randomized control trial," Soc. Sci. Med., vol. 348, p. 116846, May 2024, doi: 10.1016/j.socscimed.2024.116846.
[19] R. C. Shorey, V. Tirone, and G. L. Stuart, "Coordinated Community Response Components for Victims of Intimate Partner Violence: A Review of the Literature," Aggress. Violent Behav., vol. 19, no. 4, pp. 363–371, Jul. 2014, doi: 10.1016/j.avb.2014.06.001.

Original Research

Open Access

Assessment of Nutrition Knowledge, Attitudes, and Practices for Cardiovascular Disease Prevention among Attendees of Remera Health Centre, Kigali, Rwanda

Okesina Akeem Ayodeji[1,*], Habineza Jean Claude[2], Bushaija Emmy[1], Dufitimana Jean Paul[1], Munyaneza Jean Bosco[1], Havugimana Jean Baptiste[1], Tumayini Gad[1], Niwemahoro Consolee[1], Wabwire Paul Francis[1], Felix Niyonkuru[3], Rugira Jean Baptiste[4], Byiringiro Charite[1]

[1]*Department of Clinical Medicine and Community Health, School of Health Sciences, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda.*

[2]*NCD Division, Rwandan Biomedical Center, Kigali, Rwanda.*

[3]*Department of Occupational Therapy, School of Health Sciences, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda.*

[4]*Local Government, Kayonza District, Eastern Province, Rwanda.*

***Corresponding author:**
Okesina Akeem Ayodeji
Department of Clinical Medicine and Community Health, School of Health Sciences, College of Medicine and Health Sciences, University of Rwanda
Email:akeemokesina@gmail.com
ORCID ID: 0000-0003-3238-6676

Received: June 16, 2024
Accepted: March 23, 2025
Published: March 31, 2025

Cite this article as: Ayodeji et al. Assessment of Nutrition Knowledge, Attitudes, and Practices for Cardiovascular Disease Prevention among Attendees of Remera Health Centre, Kigali, Rwanda, 2023. *Rw. Public Health Bul. 2025. 6 (1): 24-32. https://dx.doi.org/10.4314/rphb.v6i1.4*

ABSTRACT

INTRODUCTION: Cardiovascular diseases (CVDs) represent a significant global health burden, particularly in low- and middle-income countries. This study aimed to assess the levels of knowledge, attitudes, and practices regarding nutrition for CVD prevention among attendees of Remera Health Centre in the Gasabo District, Kigali, Rwanda.

METHODS: A cross-sectional study was conducted, employing face-to-face interviews for data collection. Variables, including knowledge, attitudes, and practices, were analyzed using SPSS, and results were presented using tables and graphs. Study participants were selected through random sampling methods.

RESULTS: The study revealed that 52.3% of participants had a moderate level of knowledge, 22.8% had a low level, and 24.9% exhibited a high level of knowledge regarding nutrition and CVD prevention. Moreover, 95.4% of participants demonstrated positive attitudes, with 4.1% holding neutral attitudes and only 0.5% expressing negative attitudes. However, concerning practices, 65.5% of participants exhibited poor nutrition-related practices, while 32.5% displayed moderate practices, and only 2% demonstrated good practices.

CONCLUSION: The findings suggest that while most participants possess a high level of knowledge and positive attitudes toward nutrition for CVD prevention, there is a significant gap in translating this knowledge into practice. Efforts to improve nutritional practices among attendees of Remera Health Centre are warranted to effectively mitigate the risk of CVDs in the community.

INTRODUCTION

Non-communicable diseases (NCDs) are the leading cause of mortality and morbidity globally, and most of their burden is carried by developing nations. According to the World Health

Potential Conflicts of Interest: No potential conflicts of interest disclosed by all authors. **Academic Integrity:** All authors confirm their substantial academic contributions to development of this manuscript as defined by the International Committee of Medical Journal Editors. **Originality:** All authors confirm this manuscript as an original piece of work, and confirm that has not been published elsewhere. **Review:** All authors allow this manuscript to be peer-reviewed by independent reviewers in a double-blind review process. **Publisher:** Rwanda Health Communication Centre, KG 302st., Kigali-Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** https://rbc.gov.rw/publichealthbulletin/

Organization (WHO), NCDs account for 41 million annual deaths, or 74% of the global mortality, with cardiovascular diseases accounting for most NCD deaths of 17.9 million people annually [1].

The morbidity and mortality rates related to cardiovascular diseases (CVDs) have increased dramatically in several low- and middle-income countries (LMICs) in recent years. Approximately 80% of deaths from CVDs are thought to occur in LMICs [2].

In sub-Saharan Africa (SSA), non-communicable diseases are taking the top spot among the causes of death, where they accounted for 37% of deaths in 2019 compared to 24% in 2000, as reported by WHO[3]. Cardiovascular diseases (CVDs) account for roughly 13% of all deaths and 37% of deaths related to NCDs in Sub-Saharan Africa (SSA) [4].

In Rwanda, Cardiovascular diseases (CVDs) represent a significant public health concern as they are the country's third highest cause of mortality [5]. WHO estimates from 2016 showed that CVDs and injuries had the highest percentages of NCD-related deaths (14% each), followed by malignancies (13%), Chronic Respiratory Diseases (3%), diabetes (2%), and other NCDs (13%) [6]. Referring to the WHO Stepwise Approach 2012-2013 to NCD Surveillance (STEPS) survey, 16.4% of Rwandans had at least three of the five CVD risk factors (smoking, being overweight, having high blood pressure, eating insufficient amounts of fruit and vegetables each day, and being physically inactive [7].

A study conducted at the University Teaching Hospital of Kigali indicated that the top cause of death among inpatients was hypertension [8]. In addition, 9.4% had high blood sugar, 11.7% were obese, and 23.7% had high blood pressure since 2016 when the car-free day was launched, among 48782 people screened [9]. Poor nutrition is consistently linked to the formation of several NCDs, which comprise coronary heart diseases and diabetes. According to WHO, 80% of diabetes, cardiovascular diseases, and obesity are due to lifestyle and dietary factors [10]. Improving lifestyle and dietary intake by taking a nutritionally healthy diet is essential to overcome the above-mentioned medical conditions [11]. Food choice can be influenced by biological, economic, social, and physical factors, including taste, hunger, price, income, availability, time, skills (like cooking), education and customs, families, groups of friends, and eating habits, stress, guilt, and mood. However, knowledge, attitudes, and convictions around food influence the most [12]. In the prevention of CVDs, poor nutrition cannot be left behind as a major cause, and nutrition KAP is the only tool solution to challenge poor nutrition in the prevention of NCDs [13]. The effect of food choice on our health is evidenced by different Studies. For example, a study revealed that red meat, processed meat, sugar-sweetened drinks (SSB), and junk foods were linked to a higher risk for CVDs, whereas whole grains were linked to a lower risk [14]. Nutrition is the most essential factor in the prevention of NCDs, especially cardiovascular diseases (CVDs) [15]. The increased CVD burden in Rwanda might be a result of, among other things, limited knowledge, negative attitude, and poor practice on nutrition, concerning CVDs [16]. In a rural setting of Rwanda, a study revealed insufficient practices towards CVD prevention among rural communities, as among study participants, 79.6% habitually consume alcohol, 23.7% smoke, 53.1% eat vegetables while only 5.9% eat fruits daily, and 66.5% consume cooking oil daily[17]. Another study from the semi-urban population of Rwanda also found that the higher risk of hypertension shown in this society may be explained by lifestyle modifications, unhealthy behaviors, and dietary changes brought on by socioeconomic transition and urbanization [18].

This study aimed to assess the health-seeking behaviors of clients aged between 18 and 70 years old who were seeking services at the health center, excluding those visiting the Non-Communicable Diseases (NCDs) department.

METHODS

Research Design

This study was a health facility-based cross-sectional study conducted at Remera Health Centre in Gasabo District on participants aged 18-70 attending Remera Health Centre, who could respond to the questionnaire.

Sampling Technique

To determine the sample size needed for the study, Taro Yamane's formula was utilized, $n=N/[1+N(e)^2]$, where 'n' represents the sample size, 'N' denotes the total population (100,000), and 'e' signifies the margin of error (0.05). According to data provided by the Remera Health Centre Data Manager, the population served by Remera

comprises 100,000 individuals, distributed across four cells in the Remera sector and three cells in the Kimirinko sector. Applying the formula, the calculated sample size ("n") was determined to be 398.

Research Tool

The research instrument utilized in this study was a semi-structured questionnaire that was meticulously proofread to ensure clarity and simplicity. It comprised four distinct sections: demographic characteristics, knowledge of nutrition, attitudes toward nutrition, and practices related to nutrition for the prevention of cardiovascular diseases (CVDs) among individuals attending Remera Health Centre. Face-to-face interviews were conducted with participants using the questionnaire, and prior to the interviews, interviewees were informed of the voluntary nature of their participation. The purpose of the study was clearly explained, and consent was sought from each participant before proceeding with data collection. Interviews were exclusively conducted with individuals meeting the specified criteria. Data collection commenced after obtaining ethical clearance.

Data Analysis

Data analysis was performed using the Statistical Package for the Social Sciences (SPSS) software, version 28. Quantitative variables pertaining to demographic characteristics were analyzed by calculating frequencies and percentages. Similarly, key factors such as knowledge, attitudes, and practices were described using frequencies and percentages and presented in tabular form.

For analysis, variables were categorized as follows: Knowledge was stratified into low, moderate, and high levels. Attitude was classified as positive, negative, or neutral, and Practices were categorized as good, moderate, or poor. Overall levels of knowledge, attitude, and practices were determined based on Bloom's original cut-off points. High, moderate, and low knowledge scores were defined as ranging between 80%-100%, 60%-79%, and below 60%, respectively. Likewise, positive, neutral, and negative attitudes were delineated within the ranges of 80%-100%, 60%-79%, and below 60%, respectively.

Ethical Considerations

After the presentation and approval of the research proposal by the College of Medicine and Health Sciences (CHMS)-School of Health Sciences, the Institutional Review Board of the College of Medicine and Health Sciences at the University of Rwanda issued an ethical clearance CMCH/IRB/431/2023. Subsequently, permission was sought from Remera Health Centre Gasabo District's Authority for the collection of data. Also, before the commencement of data collection, the study participants were orientated and well-informed about the study. We ensured the voluntary participation of respondents in this study, allowing them the freedom to withdraw from the research at any point. Prior to their involvement, participants provided informed consent, and we maintained a commitment to using respectful and non-offensive language throughout the study.

RESULTS

Social demographic characteristics of the Respondents

The study involved 401 respondents, with the majority aged 24 to 34 and women comprising 62.2% of the sample. The majority were married (57.1%), with Christianity being the predominant religion (90.6%). A significant portion completed secondary schooling (36.3%), while a minority had no formal education (3.3%). The majority identified as merchants (27.1%), with farmers accounting for 9.2%. Monthly income was mostly in the range of 30000-100000, with 43.9% of participants in that range. A high percentage of participants (98%) reported having insurance coverage. However, 7 individuals were excluded due to incomplete data or responses (Table 1).

Knowledge of the respondents on CVD Prevention using nutrition

A study of 394 respondents found that a diet rich in vegetables and fruits reduces the risk of cardiovascular diseases (CVDs). A significant majority (96.6%) agreed, while a small percentage (2.5%) disagreed. A significant portion (96.6%) acknowledged the risk of excessive body weight and excessive alcohol consumption on CVDs. The study also included statements with inverted responses, where 87 respondents mistakenly believed red meat consumption was healthier than white meat, 126 disagreed with animal fat being healthier than plant oil, and 55 incorrectly believed high cholesterol prevents CVDs.

Table 1: *Socio-demographic characteristics of respondents (n=394)*

Variable	Frequency (n)	Percentage (%)
Age (years)		
Mean (SD)	31.39 (12.05)	
Min, Max	18, 70	
18 - 24	138	35
25 - 34	140	35.5
35 - 44	65	16.5
45 - 54	23	5.8
≥55	28	7.1
Sex		
Male	149	37.8
Female	245	62.2
Marital status		
Never married	149	37.8
Married	225	57.1
Widowed	11	2.8
Separated	9	2.3
Religion		
Islam	28	7.1
Christianity	357	90.6
Traditional	9	2.3
Education		
No formal education	13	3.3
Primary	110	27.9
Ikiciro rusange	85	21.6
Advanced level	143	36.3
University	43	10.9
Occupation		
Merchant	106	27.1
Student	67	17.1
Daily laborer	46	11.8
Public servant	45	11.5
Farmer	36	9.2
Others	91	23.3
Monthly income (RWF)		
<30 000	125	31.7
30 000 - 100 000	173	43.9
>100 000	96	24.4
Number of family members		
1 - 5	275	70
>5	118	30
Have insurance		
Yes	386	98
No	8	2

A significant majority (79.7%) believed that CVDs are not preventable by nutrition habits (Table 2).

The overall level of Knowledge of respondents on CVD prevention using nutrition

Utilizing Bloom's cut-off criteria, the analysis revealed that a considerable portion of participants demonstrated a moderate level of knowledge. Specifically, 206 respondents, representing 52.3% of the total participants, fell within this category (Table 3).

Sources of information about nutrition and health. The study identified various sources of nutrition and health information for the participants, with social media being the most prevalent, cited by 57.4% of respondents. Additionally, community health workers and health facilities were significant sources, reported by 40.1% and 39% of participants, respectively (Figure 1). Furthermore, an unspecified source contributed to the information acquisition process for 19.3% of the respondents. It's important to note that the total percentage exceeds 100 due to participants often accessing information from multiple sources.

Attitude of respondents to CVD prevention using nutrition

We found that 91% believe everyone can get cardiovascular diseases (CVDs). If they had CVDs, 97% would revise their eating habits and quit smoking. However, 10% would not quit even if they had CVDs. Among participants, 91.6% enjoyed vegetables and fruits, while only 7.9% did not (Table 4).

The overall level of Attitude of clients to CVD prevention using nutrition

We found a predominantly positive attitude towards cardiovascular disease prevention through nutrition, with 95.4% of them expressing positive sentiments. Only 4.1% adopted a neutral stance, and only 0.5% showed negative attitudes (Table 5).

Practices in prevention of CVDs using nutrition

Almost all (99%) participants regularly consumed vegetables and fruits, while 95.9% were non-smokers. However, a significant number of participants engaged in less favorable practices, such as alcohol consumption, fried foods and snacks, smoking, and adding salt to food. A

Table 2: *Knowledge of respondents on CVD prevention using nutrition (n=394)*

Question	Yes (n, %)	No (n, %)	Don't know/ Unsure
Does consuming a lot of vegetables and fruits decrease the risk of CVDs?	357 (90.6)	8 (2.0)	21 (7.4)
Does having excessive body weight increase one's risk of having CVDs?	361 (91.6)	12 (3.1)	21 (5.3)
Generally, is the regular consumption of red meat healthier than white meat?	87 (22.1)	227 (57.6)	80 20.3)
Is Excessive alcohol drinking dangerous to cardiovascular health?	377 (95.7)	8 (2.0)	9 (2.3)
Is Animal fat healthier than plant oil?	126 (32.0)	217 (55.1)	51 (12.9)
Does high cholesterol in the blood prevent one from CVDs?	55 (14.0)	300 (76.1)	39 (9.9)
Are CVDs not preventable by nutrition habits?	314 (94.9)	8 (2.0)	12 (3.1)
Do sugary drinks carry the risk for CVDs?	285 (72.3)	72 (18.3)	37 (9.4)

Highlighted areas indicate the correct answers

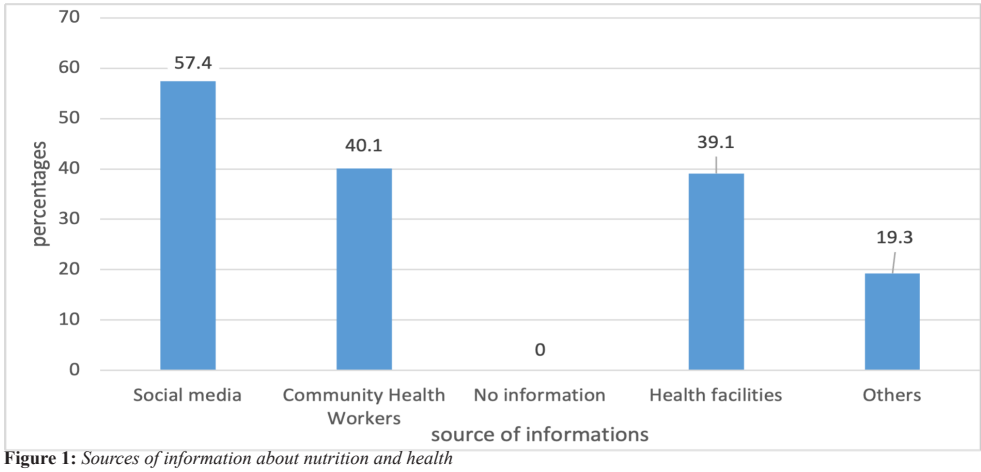


Figure 1: *Sources of information about nutrition and health*

Table 3: *The overall level of knowledge of respondents on CVD prevention using nutrition*

Variables	Categories	Frequency (n=394)	Percentage (%)
Level of knowledge*	Low level	90	22.8
	Moderate level	206	52.3
	High level	98	24.9
	Total	394	100.0

Table 4. *Attitude of the respondent to CVD prevention using nutrition (n=394)*

Question	Yes (n, %)	No (n, %)	Unsure (n, %)
Do you believe everyone can get CVDs?	360 (91.4	24 (6.1)	10 (2.5)
If I had CVDs, would I like to revise my eating habits?	385 (97.7)	2 (0.5)	7 (1.8)
If I had CVD, would I like to quit smoking?	352 (89.3	42 (10.7)	0
Do you feel happy while eating vegetables and fruits?	361 (91.6)	31 (7.9)	2 (0.5)

Table 5: *The overall level of attitude of clients to CVD prevention using nutrition (n=394)*

Variables	Categories	Frequency (N=394)	Percentage (%)
Level of attitude	Negative attitude	2	0.5
	Neutral attitude	16	4.1
	Positive attitude	376	95.4
	Total	394	100.0

significant proportion of participants (50.8%) had never sought advice from a healthcare professional regarding nutritional matters. Vegetable oil was the most used dietary oil, with 62.4% of participants favoring it. Butter was used by 35.6% of respondents, while margarine was used by 2.0% (Table 6).

Overall Level of Practice of clients towards CVD prevention using nutrition

The overall level of practices among the participants concerning cardiovascular disease (CVD) prevention through nutrition, the analysis indicated varying degrees of adherence. Specifically, out of the total 394 participants, 258 individuals (65.5%) demonstrated poor practice. A moderate level of practice was observed in 128 people (32.5%), while only a small minority of 8 individuals (2%) exhibited good practices (Table 7).

DISCUSSION

This study assessed the knowledge, attitudes, and practices related to CVD prevention through nutrition among clients attending Remera Health Centre. The results indicated that while participants demonstrated moderate knowledge and positive attitudes, their practices remained poor. This gap between awareness and behaviour highlights the need for targeted interventions to translate knowledge into actionable practices. Public health initiatives should focus on behaviour change strategies, such as nutrition education programs,

Table 6: *Practice of clients towards CVD prevention using nutrition (n=394)*

Question	Yes (n, %)	No (n, %)
Do you eat vegetables and fruits?	390 (99.0)	4 (1.0)
Do you drink a lot of sugary drinks?	355 (90.1)	39 (9.9)
Are you currently smoking?	16 (4.1)	378 (95.9)
Are you currently consuming alcohol?	126 (32.0)	268 (68.0)
Do you often eat fried food and snacks?	282 (71.6)	112 (28.4)
Do you add salt while you are eating?	194 (49.2)	200 (50.8)
Did you consult a nutrition specialist or any other health professional about your nutritional choice?	95 (24.1)	299 (75.9)
What type of oil or fat do you mostly use?		
Vegetable oil	246 (62.4)	
Butter or Ghee	140 (35.6)	
Margarine	8 (2.0)	

Table 7: *Overall Level of practice towards CVD prevention using nutrition (n=394)*

Variables	Categories	Frequency (N=394)	Percentage (%)
Level of practice	Poor practice	258	65.5
	Moderate practice	128	32.5
	Good practice	8	2.0
	Total	394	100.0

tailored counseling sessions, and practical skill-building activities to improve adherence to recommended dietary practices. Interestingly, participants exhibited more favourable attitudes than knowledge levels, challenging the notion that poor practices arise solely from a lack of awareness or negative perceptions. Similar trends were observed in previous studies conducted in Kigali, Rwanda, which reported high knowledge and moderate attitudes but poor practices [18].

However, these studies predominantly examined urban populations, leaving rural populations underrepresented. Addressing this gap requires community-based interventions that extend beyond awareness campaigns and incorporate culturally appropriate, accessible, and sustainable dietary practices tailored to both urban and rural populations. The moderate knowledge levels found in this study align with findings from Uganda [19]. Suggesting a broader regional trend. However, contrasting evidence from Egypt and Spain reported lower knowledge levels, indicating that awareness varies across different socio-economic and cultural settings [20, 21]

These disparities emphasize the importance of strengthening knowledge dissemination efforts through school-based nutrition programs, healthcare provider engagement, and mass media campaigns tailored to local contexts to ensure better comprehension and application of nutritional guidelines for CVD prevention. Positive attitudes towards CVD prevention were consistently observed in studies from Rwanda [18], Nepal, and Eastern Nepal, reflecting a universal trend across diverse populations. However, contrasting findings from Lebanon [22] and Jordan [23] revealed negative attitudes, suggesting that cultural and societal factors may influence perceptions of disease prevention. These variations underscore the need for region-specific approaches that address underlying socio-cultural determinants influencing attitudes and health behaviors. Interventions such as culturally adapted nutrition counseling and community support groups can help reinforce positive attitudes and bridge the gap between awareness and practice. Despite ongoing non-communicable disease (NCD) awareness campaigns, mass media sensitization, and community engagement initiatives such as car-free days, the study found that the translation of knowledge and attitudes into tangible practices remains inadequate. This reinforces the necessity of practical, hands-on interventions such as cooking demonstrations, grocery store tours, and the integration of nutrition counseling into routine healthcare visits. Policymakers should consider implementing incentive-based programs that encourage individuals to adopt and sustain heart-healthy dietary behaviors.

Consistent with previous research, this study found that poor nutritional practices were predominant, with only a small fraction of participants demonstrating good practices. These results align with findings from Kigali, Rwanda [18], and among Jordanian elderly populations [24] but contrast with studies from Nigeria, where a higher proportion of participants exhibited good nutritional practices, likely due to their chronic disease status and access to education during healthcare visits [25]. Given these regional differences, a comprehensive approach incorporating both preventive and therapeutic nutrition strategies is necessary to encourage better dietary habits among diverse populations.

Given the variability in KAP across regions, further research is needed to explore the underlying barriers to behavioral change and to design interventions that address these barriers effectively. Tailored public health programs that incorporate local dietary habits, socioeconomic factors, and healthcare access can enhance the effectiveness of CVD prevention strategies. Additionally, integrating digital health tools, such as mobile applications and telehealth nutrition counseling, could provide accessible and scalable solutions for promoting healthier lifestyles [26, 27, 28, 29].

This study has some limitations. First, its cross-sectional design restricts the ability to establish causal relationships between knowledge, attitudes, and practices regarding nutrition and CVD prevention. Second, the reliance on self-reported data may introduce recall and social desirability biases, particularly concerning sensitive topics like dietary practices. Third, the study was conducted at a single health center in an urban setting, limiting the generalizability of findings to rural or other regional populations. Fourth, the convenience sampling method may not fully represent the broader population, potentially skewing results. Additionally, the study did not explore the influence of socioeconomic factors, such as income or education, which

could significantly impact nutritional practices. Lastly, the limited time frame for data collection due to academic and clinical commitments may have constrained the depth and breadth of data gathered. These limitations highlight the need for more comprehensive, longitudinal studies to better understand and address the gaps in CVD prevention practices.

CONCLUSION

This study identified a significant disparity between knowledge, attitudes, and practices regarding CVD prevention through nutrition among clients attending Remera Health Centre. While participants exhibited moderate knowledge and positive attitudes, their actual dietary practices were largely inadequate. This highlights the challenge of converting awareness into sustainable behaviour change. To bridge this gap, public health programs should implement practical, community-driven interventions that not only educate but also empower individuals to adopt and maintain heart-healthy dietary behaviours. Future research should focus on understanding regional disparities and developing evidence-based strategies that effectively promote healthier lifestyles and reduce the burden of CVDs. We recommend conducting longitudinal studies to assess the long-term impact of knowledge and attitude changes on actual dietary practices, investigate the specific barriers preventing individuals from translating knowledge and positive attitudes into healthier nutritional behaviours, developing and evaluate culturally tailored, community-based intervention programs to improve CVD prevention practices, exploring the effectiveness of digital health tools, such as mobile applications and telehealth nutrition counseling, in promoting heart-healthy behaviours, and finally assessing the role of healthcare providers in influencing patient dietary behaviours and identify strategies to enhance their involvement in nutrition education.

REFERENCES

[1] WHO, "NonCommunicable Diseases." https://www.who.int/health-topics/noncommunicable-diseases

[2] O. A. Uthman et al., "Multiple risk factor interventions for primary prevention of cardiovascular disease in low- and middle-income countries," Cochrane Database of Systematic Reviews, vol. 2014, no. 6, 2019, doi: 10.1002/14651858.CD011163.

[3] WHO, "Death from non-communicable diseases." https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/ncd-mortality

[4] M. F. Yuyun, K. Sliwa, A. P. Kengne, A. O. Mocumbi, and G. Bukhman, "cardiovascular diseases in sub-saharan Africa compared to high-income countries: An epidemiological perspective," Global Heart, vol. 15, no. 1, pp. 1–18, 2020, doi: 10.5334/GH.403.

[5] J. B. Niyibizi et al., "Perceived cardiovascular disease risk and tailored communication strategies among rural and urban community dwellers in Rwanda: a qualitative study," BMC Public Health, vol. 22, no. 1, pp. 1–14, 2022, doi: 10.1186/s12889-022-13330-6.

[6] 2020 MOH, "National Strategy and Costed Action Plan for the Prevention and Control of Non-Communicable Diseases in Rwanda," Ministry of Health (Rwanda), no. July, p. 107, 2020.

[7] T. Phiri, J. P. Nganabashaka, J. Uwimana-nicol, J. Burns, T. Young, and E. Rehfuess, "Situation Analysis of Population Level Interventions Targeting Risk Factors for Diabetes Mellitus and Hypertension Implemented in Rwanda, Malawi, and South Africa: A Desk Review," pp. 1–18.

[8] T. Phiri, J. P. Nganabashaka, J. Uwimana-nicol, J. Burns, T. Young, and E. Rehfuess, "Situation Analysis of Population Level Interventions Targeting Risk Factors for Diabetes Mellitus and Hypertension Implemented in Rwanda, Malawi, and South Africa: A Desk Review," pp. 1–18.

[9] World Health Organization, Rwanda Ministry of Health, MOH, and 2020 MOH, "National Strategy and Costed Action Plan for the Prevention and Control of Non-Communicable Diseases in Rwanda," Ministry of Health (Rwanda), no. July, p. 107, 2020.

[10] I. Haq, "A comparative study of nutritional status, knowledge attitude and practices (KAP) and dietary intake between international and Chinese students in Nanjing, China," International Journal of Environmental Research and Public Health, vol. 15, no. 9, pp. 1–11, 2018, doi: 10.3390/ijerph15091910.

[11] A. Bosy-Westphal and M. J. Müller, "[Diet and Nutrition in the Prevention of Non-Communicable Diseases (NCD)].," Deutsche medizinische Wochenschrift (1946), vol. 146, no. 6, pp. 389–397, Mar. 2021, doi: 10.1055/a-1248-5539.

[12] Anonim, "The Factors That Influence Our Food Choices," Eufic, no. June, pp. 15–16, 2018.
[13] J. M. de Jesus, S. Kahan, and R. H. Eckel, "Nutrition Interventions for Cardiovascular Disease.," The Medical clinics of North America, vol. 100, no. 6, pp. 1251–1264, Nov. 2016, doi: 10.1016/j.mcna.2016.06.007.
[14] L. Schwingshackl et al., "Food groups and risk of type 2 diabetes mellitus: a systematic review and meta-analysis of prospective studies," European Journal of Epidemiology, vol. 32, no. 5, pp. 363–375, 2017, doi: 10.1007/s10654-017-0246-y.
[15] Ministry of Health and Medical Services and Solomon Islands, "Healthy Village Facilitator's Guide: Non-Communicable Diseases (NCDs) and Nutrition," Health Promoting Village Project, no. May, 2021.
[16] globalnutritionreport.org, "Rwanda - Global Nutrition Report," 2022.
[17] L. N. Nyagasare, E. Muvandimwe, M. Habtu, and E. Rutayisire, "Knowledge, Attitudes and Practices about Cardiovascular Diseases among Adult Patients Attending Public Health Centers in Kigali city, Rwanda," Journal of Public Health International, vol. 5, no. 1, pp. 23–36, 2022, doi: 10.14302/issn.2641-4538.jphi-22-4189.
[18] L. N. Nyagasare, E. Muvandimwe, M. Habtu, and E. Rutayisire, "Knowledge, Attitudes and Practices about Cardiovascular Diseases among Adult Patients Attending Public Health Centers in Kigali city, Rwanda," Journal of Public Health International, vol. 5, no. 1, pp. 23–36, 2022, doi: 10.14302/issn.2641-4538.jphi-22-4189.
[19] M. Esther, "Knowledge , Attitude , and Practice Regarding Risk of Cardiovascular Diseases among Adult Patients Attending Outpatient Department at Kampala International University Teaching Hospit ... International Network Organization for Scientific Research Knowledge," no. October, 2023.
[20] M. Á. Manzano-Felipe, C. Cruz-Cobo, M. Á. Bernal-Jiménez, and M. J. Santi-Cano, "Validation of the General and Sport Nutrition Knowledge Questionnaire (GeSNK) in Spanish Adolescents," Nutrients, vol. 14, no. 24, pp. 1–10, 2022, doi: 10.3390/nu14245324.
[21] M. M. Zein, A. T. Mahmoud, A. S. El Hawary, and N. Hegazy, "Cardiovascular diseases healthy diet related knowledge among a sample of the general population in egypt," Open Access Macedonian Journal of Medical Sciences, vol. 9, no. B, pp. 1764–1771, 2021, doi: 10.3889/oamjms.2021.7541.
[22] M. Machaalani et al., "Knowledge, Attitude, and Practice Toward Cardiovascular Diseases in the Lebanese Population," Global Heart, vol. 17, no. 1, 2022, doi: 10.5334/gh.1138.
[23] F. Hammouh, M. Abdullah, A. Al-bakheit, N. J. Al-awwad, and I. Dabbour, "Nutrition Knowledge, Attitudes, and Practices (KAPs) among Jordanian Elderly—A Cross-Sectional Study," pp. 1–10, 2023.
[24] F. Hammouh, M. Abdullah, A. Al-bakheit, N. J. Al-awwad, and I. Dabbour, "Nutrition Knowledge, Attitudes, and Practices (KAPs) among Jordanian Elderly—A Cross-Sectional Study," pp. 1–10, 2023.
[25] S. Chowdhury and P. pratim Chakraborty, "Nutrition-related knowledge, practice, and weight status of patients with chronic diseases attending a district hospital in Nigeria," Journal of Family Medicine and Primary Care, vol. 6, no. 2, pp. 169–170, 2022, doi: 10.4103/jfmpc.jfmpc.
[26] World Health Organization (WHO), "Nutrition." https://iris.who.int/bitstream/handle/10665/66509/WHO_NHD_00.6.pdf;sequence=1
[27] A. G. da Vitória, J. de Souza Couto Oliveira, L. C. de Almeida Pereira, C. P. de Faria, and J. F. B. de São José, "Food safety knowledge, attitudes and practices of food handlers: A cross-sectional study in school kitchens in Espírito Santo, Brazil," BMC Public Health, vol. 21, no. 1, pp. 1–10, 2021, doi: 10.1186/s12889-021-10282-1.
[28] A. Alhazmi, M. H. M. Ali, A. Mohieldin, F. Aziz, O. B. Osman, and W. A. M. Ahmed, "Knowledge, attitudes and practices among people in Saudi Arabia regarding COVID-19: A cross-sectional study," Journal of Public Health Research, vol. 9, no. 3, pp. 345–353, 2020, doi: 10.4081/jphr.2020.1867.
[29] A. Yoseph, A. Tamiso, and A. Ejeso, "Knowledge, attitudes, and practices related to COVID-19 pandemic among adult population in Sidama Regional State, Southern Ethiopia: A community based cross-sectional study," PLoS ONE, vol. 16, no. 1 January, pp. 1–19, 2021, doi: 10.1371/journal.pone.0246283.

Original Research

Open Access

Employee Turnover in a Tertiary Hospital in Rwanda: Baseline Analysis of the Trend

Belson Rugwizangoga[1,2,*], Emmanuel Munyaneza[1], Emmanuel K. Rusingiza[1,2], Marianne Munyarugerero[3], Sifa Nyiransengiyumva[3], Jean Bosco Bahimana[3], Betty Mbabazi[3], Timothée S. Twahirwa[4], Oswald Ndibagiza[4], Martin Nyundo[5], Theobald Hategekimana[4], David Nzanira[4,6], Florence Masaisa[1,2]

[1]*Clinical Education and Research Division, University Teaching Hospital of Kigali, Kigali, Rwanda.*
[2]*School of Medicine and Pharmacy, College of Medicine and Health Sciences, University of Rwanda, Kigali, Rwanda.*
[3]*Office of the Deputy Directorate General for Support Services, University Teaching Hospital of Kigali, Kigali, Rwanda.*
[4]*Office of the Directorate General, University Teaching Hospital of Kigali, Kigali, Rwanda.*
[5]*Clinical Services Division, University Teaching Hospital of Kigali, Kigali, Rwanda.*
[6]*Quality Management Solutions, Hayfields, South Africa*

***Corresponding author:**
Dr. Belson Rugwizangoga
University Teaching Hospital of Kigali (CHUK), Kigali, Rwanda
E-mails: belson.rugwizangoga@chuk.rw; b.rugwizangoga@ur.ac.rw

Received: Novemeber 23, 2024
Accepted: March 7, 2025
Published: March 31, 2025

Cite this article as: Rugwizangoga et al. Employee Turnover in a Tertiary Hospital in Rwanda: Baseline Analysis of the Trend. *Rw. Public Health Bul. 2025. 6 (1): 33-42.* https://dx.doi.org/10.4314/rphb.v6i1.5

ABASTRACT

INTRODUCTION: Turnover is an important issue to monitor properly as it is associated with many consequences, including monetary costs. This study aimed to determine the rate, types, and factors of employee turnover in the largest public teaching hospital in Rwanda.
METHODS: Archival documents were used to document rates, types, and factors of employee turnover at the University Teaching Hospital of Kigali (CHUK) during the 2012–2022 period. Ethical clearance was acquired before data collection.
RESULTS: The overall turnover rate was 4.87%. Higher annual rates were attributed to either decreased staff fringe benefits, massive recruitment in facilities offering better payments, or restructuring. The median age of employees at exit was 40.45 years, mostly female employees (58.5%). Most cases were married (55%), Rwandans (95%), and residing in Kigali City (47%). Surgery (17%), Administration (13%), and Obstetrics and Gynecology (11%) were the most implicated units. Median for work experience was 9 years. The main reasons for separation are personal or resignation (42%), leave of absence (14%), restructuring (12%), retirement (11%) and dismissal (11%). Highly qualified employees and those with experience ≥20 years represented 14% and 30% of the exiting staff, respectively. Involuntary turnover (31%) was the main type of turnover. Involuntary and voluntary unavoidable turnover types were associated with higher age (P<0.0001) and long work experience (P<0.0001).
CONCLUSION: The overall turnover rate at CHUK is within an acceptable range, but annual fluctuations reflect experienced negative motivational factors. Moreover, avoidable departure of high- or rare-skill staff was noted, sparking the need to implement staff retention strategies.

Potential Conflicts of Interest: No potential conflicts of interest disclosed by all authors. **Academic Integrity:** All authors confirm their substantial academic contributions to development of this manuscript as defined by the International Committee of Medical Journal Editors. **Originality:** All authors confirm this manuscript as an original piece of work, and confirm that has not been published elsewhere. **Review:** All authors allow this manuscript to be peer-reviewed by independent reviewers in a double-blind review process. **Publisher:** Rwanda Health Communication Centre, KG 302st., Kigali-Rwanda. Print ISSN: 2663 - 4651; Online ISSN: 2663 - 4653. **Website:** https://rbc.gov.rw/publichealthbulletin/

INTRODUCTION

Employee turnover rate is the proportion of an organization's workforce that leaves during a specific period, regardless of reason, and needs to be replaced [1]. It is associated with many consequences, including hampering the effectiveness, productivity, profitability, and innovative efforts of the institution [2]. For example, employee turnover involves monetary costs, which are classified into direct (such as recruiting new staff, investing in training, and orienting the new staff) and indirect (associated with using inexperienced staff) costs [3-7]. In addition, intangible costs happen, such as client dissatisfaction and demoralized departments due to unduly increased workload to the remaining staff [3, 6, 8, 9]. It is estimated that the cost of an employer turnover can be as high as 150% of that employee's annual compensation [4, 6, 7]. It is, therefore, imperative for institutions to keep employee turnover rates as low as possible.

To keep the employee turnover rates in the standard ranges, it is important to identify the categories and factors of the turnover. The broad types of employee turnover are voluntary or employee-initiated (which can be avoidable or unavoidable) and involuntary or employer-initiated (such as those due to discharge or downsizing) [10]. Controllable factors of employee turnover overlap, to some extent, with the factors of the psychological risks of the job, as described by the European Working Conditions Survey (EWCS) [8]. In summary, job demands, available resources, and experienced motivational processes influence the employee's health and well-being. It is noteworthy to state that for multiple job holders, some of these factors may emerge from employers other than the main one [8]. Data on employee turnover in Africa is rare. Available data from South Africa show that the main causes of employee turnover are the lack of career advancement, lack of promotion, unsatisfactory salary, unsatisfactory working conditions, and work stress [2]. A recent study involving cases from Ethiopia, Korea, and Rwanda recommended implementing good human resource development programs to control the turnover and turnover intention of employees [11]. Previously, the Rwanda Public Service Commission reported that employee turnover in public institutions is very high, while the process and procedure to fill vacant positions is tedious [12]. While the employee turnover rate in Rwanda in sectors other than health is reported to be 18% in central and local government, 10.8% in the judiciary, and as low as 1.4% in the education system [13], such a rate is in average 8.7% for public sector health workers [14].

To date, data on employee turnover at the University Teaching Hospital of Kigali (CHUK) has not been documented. Determining the rate, causes, or associated factors would inform managers to improve and/or maintain in the management of human resources. Also, this study is among the international standards required for health facility accreditation, for example, the standard 2.1.1.4 of the Council for Health Service Accreditation of Southern Africa (COHSASA) [15]. This study aims at determining, for the first time, the rate and factors of employee turnover at CHUK.

METHODS

Study design, setting, population, and duration

This is a retrospective study conducted at CHUK; the mainstay is the Directorate of Human Resource Management (HRM). It included all employee turnover cases for a period of 10 years (July 2012–June 2022). This period incorporates the pre- and post-restructuring era at CHUK (restructuring happened in phases between 2012 and 2016). Data were collected from December 2021 to August 2022.

Data collection procedures

Turnover cases were identified from changes in payrolls (July 2012 – June 2021) and the quarterly reports of HRM (July 2016 – June 2022). Thus, a list of turnover cases was established, and a unique code was assigned to each case to anonymize the data. Their complete files were retrieved from HRM archives to document their demographic data (age, sex, residence district, nationality), date of recruitment, date of turnover, the reason for turnover, exit interview, job title, employment mode (permanent/time-limited contract), career development antecedents, educational attainment, KSAOs, health, and disciplinary antecedents. Moreover, gross salary at exit was retrieved from the payroll of the month preceding the turnover for each employee. To calculate annual employee turnover rates, we used the total number of

employees on 30th June of each fiscal year.

Inclusion and exclusion criteria

Any staff of CHUK who left the institution during the study period either permanently or for undetermined sabbatical leave or study leave that needs replacement. The study excluded CHUK staff who left the institution for short-term periods such as maternal, sick, and study leave that did not need replacement. Staff working for outsourcing companies (security, hygiene, information technology help desk) by CHUK were also excluded from this study.

Sample size estimation

The sample size is estimated employing the following formula: $N=(Z^2\times P(1-P))/d^2=(1.96^2\times 0.10(1-0.10))/0.05^2 =138,3 \approx 139$

Where: N= size of the sample; P=10.0% (considering the average turnover rate in different public services in Rwanda [13], Z= 1.96 (significance level), d = Precision (0.05) at 95% confidence interval (CI).

Data management and statistical analysis

Anonymous data were entered into a pre-tested data collection sheet. Data compilation was performed using Microsoft Excel software and exported to International Business Machines Corporation (IBM) Statistical Product and Service Solutions (SPSS) 28.0 (IBM Inc., New York 10504-1722, USA) for analysis (tabulations). Statistical analysis was run on GraphPad Prism 9.5 (GraphPad Software, Inc., CA 92037 USA). We employed the Chi-square test for comparing proportions, and the Kruskal-Wallis test for median comparison, accordingly. Association between variables was considered statistically significant if a two-tailed P value <0.05.

Ethical considerations

Ethical clearance was obtained from the hospital research ethics committee (Ref. N° EC/CHUK/121/2021) prior to the data collection. The identity of participants was protected throughout the study and the dissemination of its findings. Data collection documents are kept in a locked place where only the principal investigator has access. The anonymized electronic information is kept in a password-protected computer. No employee particulars are disclosed in the disseminated findings.

RESULTS

The 10-year period recorded 376 employee turnover cases. During the in-depth data collection, some files couldn't be retrieved. Thus, the in-depth analysis of cases encompassed only 189 cases. Figure 1 outlines the enrolment of employee turnover cases in this study.

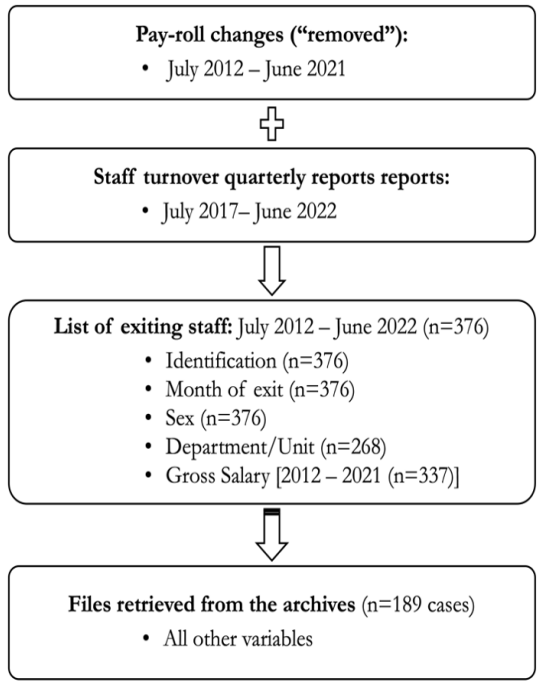


Figure 1: *Enrolment of study participants*

Table 1 shows the sociodemographic and turnover characteristics of departing employees. Briefly, there was a predominance of females (59%), middle-aged employees (median age of 40.45 years), and most residents in Kigali City (47%). The work experience of departing employees was 9 years. Surgery (17%), Administration (11%), and Obstetrics & Gynecology (11%) were the most frequently implicated departments/units. Nurses and midwives comprised 59% of all departing healthcare providers.

As shown in Table 3, the six main reasons for separation, as initially documented are personal or resignation (42%), leave of absence (14%), restructuring (12%), retirement (11%), dismissal (11%) and end of contract (5%) while the six main reasons identified at exit interview were personal reasons (25%), retirement (17%), leave of absence (14%), restructuring (14%), end of contract (8%)

Table 1: *Sociodemographic characteristics of departing employees*

Parameters	n	%
Sex (n=376)		
Male	156	41.49
Female	220	58.51
Age (n=189) in years		
25th percentile	34.55	-
50th percentile (median)	40.45	-
75th percentile	49.63	-
Nationality (n=189)		
Rwandans	180	95.24
Foreigners	9	4.76
Residence (Province), n=189		
Kigali City	89	47.09
South	39	20.63
West	28	14.81
East	14	7.41
North	12	6.35
Other	7	3.70
Work experience at CHUK (n=189) in years		
25th percentile	4.44	-
50th percentile (median)	9.04	-
75th percentile	18.86	-
Work experience, overall (n=189) in years		
25th percentile	5.00	-
50th percentile (median)	9.00	-
75th percentile	19.50	-
Employment type (n=189)		
Permanent staff	164	86.77
Contractual staff	19	10.05
Academic staff	6	3.18

Parameters	n	%
Department/Unit (n=268)		
Surgery	45	16.79
Administration	35	13.06
Obstetrics & Gynecology	30	11.19
Pediatrics	25	9.33
Internal Medicine	24	8.96
Anesthesia & Critical Care	21	7.84
Finances	21	7.84
Accident & Emergency Medicine	16	5.97
Radiology	10	3.73
Maintenance & ICT	10	3.73
Mental Health	9	3.36
Pathology	8	2.99
Pharmacy	6	2.24
Others	8	2.99
Job title at exit for healthcare professionals (n=158)		
Doctors (n=28)		17.72
Specialist	22	13.92
General Practitioner	6	3.80
Nurses & midwives (n=93)		58.86
Senior (A0)	7	4.43
Advanced Diploma (A1)	62	39.24
Assistant Nurse (A2)	24	15.19
Diagnostic & Therapeutic Professionals (n=37)		23.42
Specialist (MSc)	2	1.27
Senior (A0)	10	6.33
Advanced Diploma (A1)	19	12.03
Assistant (A2)	6	3.80

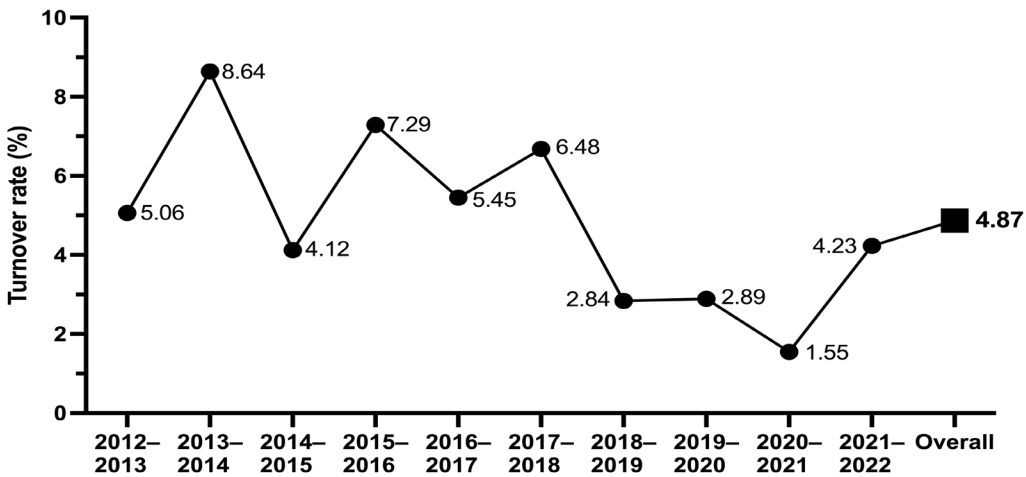


Figure 2: *Employee turnover rates at CHUK during July 2012 – June 2022*

Table 2: *Turnover characteristics of departing employees*

Parameters	n	%
Reasons for separation (initially reported), n=189		
Personal reason & resignation	79	41.80
Leave of absence	27	14.29
Restructuring	22	11.64
Retirement	21	11.11
Dismissal	20	10.58
End of contract	10	5.29
Transfer	5	2.65
Deceased	5	2.65
Reasons for separation (at exit interview), n=126		
Personal reasons	31	24.60
Retirement	21	16.67
Leave of absence	18	14.29
Restructuring	18	14.29
End of contract	10	7.94
Dismissal	8	6.35
Resignation	6	4.76
Refused COVID-19 vaccination	6	4.76
Transfer to other hospitals	5	3.97
No license to practice	1	0.79
Refused to take oath	1	0.79
Sickness	1	0.79
Exit interview conducted (n=189)		
Yes	126	66.67
No	63	33.33
Why no exit interview (n=63)		
Abrupt turnover	41	65.08
Deceased	5	7.94
Exit interview not mandatory	2	3.17
Not documented	15	23.81
Additional qualification during service (n=189)		
Yes	44	23.28
No	145	76.72
Additional qualification in the same field (n=44)		
Yes	39	88.64
No	5	11.36
Additional qualification recognized in wages (n=44)		
Yes	37	84.09
No	7	15.91
Knowledge, skills, abilities, and other (KSAOs) characteristics (n=189)		
Sub-specialization (medics), Master's (others), PhD	27	14.29
Experience ≥20 years, avoidable turnover	37	19.58
None to declare	125	66.14
History of disciplinary measure (n=189)		
Yes	21	11.11
No	168	88.89
Chronic health issues (n=189)		
Yes	2	1.06
No	187	98.94
Types of turnover (n=189)		
Involuntary (employer-initiated)	59	31.22
Voluntary – unavoidable	33	17.46
Voluntary – avoidable – don't prevent	53	28.04
Voluntary – avoidable – try to prevent	44	23.28
Qualification of the replacing staff (n=181)		
Higher compared to the exiting employee	31	17.13
Same compared to the exiting employee	150	82.87
Experience of the replacing staff (n=181)		
Higher compared to the exiting employee	13	7.18
Same compared to the exiting employee	33	18.23
Lower compared to the exiting employee	135	74.59

and dismissal for unspecified disciplinary reasons (6%). There was a tendency for new staff to have the same or higher qualifications and lower experience than the exiting staff. Highly qualified employees and those with experience ≥20 years represented 14% and 30% of the exiting staff, respectively. Involuntary (31%) and voluntary – avoidable – don't prevent (28%) were the most common turnover types. The total gross salaries for the month preceding the exit for employees who departed from July 2012 to June 2021 was 198,862,852 Rwandan Francs (FRW), implying that the costs for the replacement of employees who departed during that period are estimated to be approximately 3,506,787,212 FRW (150% of the annual gross salaries). Employee turnover rates range from 1.55% (2021 – 2022) to 8.64% (2013–2014), with an overall turnover rate of 4.87%, as shown in Figure 2. HRM reported factors to higher rates seen during the fiscal year 2013 – 2014 (8.64%, attributed to the decrease of staff fringe benefits), 2015 – 2016 (7.29%, attributed to massive recruitment in facilities offering better payments), and 2017–2018 (6.68% due to the

Table 3: *Types of employee turnover versus sociodemographic and skills characteristics*

Sociodemographic and skills parameter		Involuntary (employer-initiated)	Voluntary – avoidable – do not prevent	Voluntary – Avoidable – try to prevent	Voluntary – unavoidable	P
Sex (n)	M	26	27	18	8	0.1049[a]
	F	33	26	26	25	
Marital status (n)	Married	30	26	22	26	0.0030[a]
	Single	23	26	22	4	
	Divorced and widow-er	6	1	0	3	
Age (median years)		44	35	43	60	
Work experience at CHUK (median years)		13	5	13.5	20	
Overall work experience (median years)		13	5	15	21	
KSAOs	Sub-specialization (medics), Master's (others), PhD	5	4	12	6	
	Experience ≥20 years, avoidable turnover	17	0	5	15	
	None to declare	37	49	27	12	

[a]Chi-Square test; [b]Kruskal-Wallis test; CHUK: University Teaching Hospital of Kigali; KSAOs: Knowledge, skills, abilities and other characteristics; PhD:Doctor of Philosophy.

implementation of the 2016 restructuring).

DISCUSSION

Keeping the employee turnover rates within acceptable ranges is key to maintaining institutional productivity and efficiency [16]. This procedure entails putting in place a strategy for regularly controlling the factors of turnover. Such a system is rarely reported in low- and middle-income countries (LMICs), including Rwanda. This study aimed to investigate the rate and factors of employee turnover at one of Rwanda's leading teaching and referral hospitals during the period of July 2012–June 2022. To the best of our knowledge, this study is the first of its kind to document the employee turnover at CHUK in Rwanda.

In the present study, most participants were females, which mirrors a high proportion of females among CHUK employees. Likewise, the high representation of participants residing in the City of Kigali (47%) is explained by the location of the hospital in that city. However, it is important to highlight that having 53% of the participants residing far from the workplace may constitute a factor in staff dissatisfaction and turnover [17, 18]. A study done in South Africa showed that gender affects employee mobility [19].

The findings of this study show that the exiting employees are generally middle-aged (median age of 40.45 years) and with a median experience of 9 years, implying an active, experienced group of employees whose departure means a loss of a wealth of expertise [10]. It is important to note that, according to a previous report from Rwanda, the turnover of managers and essential employees is a major obstacle to the quality of services and, therefore, a hindrance to obtaining healthcare facility accreditation [20]. Furthermore, the fact that involuntary turnover (mainly due to restructuring) was associated with higher age and work experience sparks the necessity of establishing a career development plan for the staff [2, 10], ensuring this kind of turnover minimization. Also, when special attention is made to the small but special group of divorced and widow-er employees who exited, it appears that at least 60% of these cases (restructuring, dismissal,

end of contract) of turnover would be avoided if specific psychosocial support had been provided to them in due time [2, 8, 10].

Although some of the most involved departments (such as Surgery) are also very large in terms of staffing, it is important to note that other departments/units (such as Administration, Obstetrics & Gynecology) with high staff attrition are basically not comparatively having a high number of staff. This sparks the need to conduct further investigations to understand the turnover intention in different departments/units [11, 21-25]. While considering the job title of exiting employees, nurses/midwives comprised 59% of cases; this also mirrors the high proportion of nurses/midwives among all employees of CHUK. It is very important to note that the departure of specialized healthcare providers (such as 2–3 specialized medical doctors each year, as seen in this study) has had serious negative consequences on the performance of the institution [10]. Thus, special staff retention strategies should be established [2, 8, 10, 17]. This is specifically important for CHUK because, as shown in this study, the voluntary avoidable turnover that the institution should have prevented was associated with high KSAOs.

The overall employee turnover rate at CHUK for the period of July 2012 – June 2022 was 4.87%. This rate may be interpreted as acceptable because it is <10%, generally regarded as the maximum acceptable rate [26, 27], quite lower than 11.2% and 18% reported in the judiciary and local administration in Rwanda, respectively [13]. This rate is also lower than 10% reported in another tertiary hospital in Rwanda [28], 11% reported among medical doctors across the country [29], and approximately 32% reported among medical doctors working in a rural district hospital in Rwanda [30]. However, as highlighted in previous paragraphs, it is important to consider the turnover rate and the KSAOs of departing staff, among other things. Annual turnover rates >5%, which occurred during the study period, coincided with issues (decrease) in salaries and other benefits (2013–2014), better offers in terms of payments (2015–2016), and restructuring (2017–2018). The first two issues need to be addressed through regular analysis and optimization of the job demands-resources model [8] with special consideration to salaries and other employee benefits (such as recognition of staff achieved skills, grades, and qualifications) [8, 10, 31], while the third issue should be addressed through ensuring optimal career development guidance. Furthermore, after lower employee turnover rates ranging from 1.55–2.89% from 2018/2019–2020/2021, we observed an increase of the rate to 4.23% in the year 2021/2022; thorough analysis showed that the main reason for the increase in turnover during 2021/2022 was related to the Coronavirus disease 2019 (COVID-19) pandemic. Specifically, these factors include getting international opportunities in COVID-19 control programs, as well as refusal to get vaccinated. Studies in other settings have reported a similar trend of the increase in employee turnover and turnover intention among healthcare providers during the COVID-19 pandemic [24, 25] and the immediate post-pandemic period [32].

The six main reasons for separation were unspecified personal reasons or resignation (42%) and leave of absence (14%). Anecdotal observations show that the reality is the obtention of opportunities such as further studies or jobs, usually short-term, that are important for the career development of the employees. One of the strategies for coping with this turnover would be establishing a policy on sabbatical leave whereby the employee would return to the institution, with a win-win scenario for both the employee and the employer. Continual, employee-centered training and two-way communication between employer and employee are paramount in reducing employee turnover through timely identification and resolution of any negative factor to the job and ultimately secure good staff satisfaction [6, 33, 34]. It is in that perspective that developed countries regularly monitor and report on the welfare of the employees to understand the progress made, define the challenges, and determine the steps to take to further improve job quality and make the work more sustainable [8].

New staff tended to have the same or higher qualifications and lower experience than the exiting staff. Notwithstanding the relatively higher qualifications of the new employees, the replacement of employees costs the institution a lot, estimated to range as high as 1.1 (or 110%) up to 2 (or 200%) times the departing employee's annual salary [3-7]. Based on an assumption of turnover costs estimated at 150% of the annual employee's salary, the estimated costs for replacing CHUK employees who departed from July 2012 to June 2021 were approximately 3.5 billion FRW; a

prospective study aligned with health economics principles would give exact costs of employee replacement in the context of Rwanda.

This study has limitations mainly due to its retrospective type, that is, data incompleteness in some cases, including failure to retrieve the files. In some cases, the exact cause of voluntary turnover could not be identified, especially for cases in which no exit interviews were conducted. Specifically, this study relies on payroll and other human resource records, which may, to some extent, not always accurately capture voluntary resignations or dissatisfaction-related exits. This is particularly relevant because a considerable proportion of employees did not undergo exit interviews. Further studies are warranted to prospectively capture employee turnover intention through in-service surveys and document the reasons for leaving the institution through exit interviews.

CONCLUSION

The overall turnover rate at CHUK is within acceptable range, but annual fluctuations reflect experienced negative motivational factors. Moreover, the avoidable departure of high- or rare-skill staff was noted, sparking the need to implement staff retention strategies, both at national as well as institutional levels, which would also lower the high costs associated with employee turnover in the healthcare system. Such strategies include consistent employee-centered training and two-way communication between employer and employee, as well as timely identification and resolution of any negative factor to the job, thus promoting job satisfaction. Attention would also be taken to staff needing special psychosocial support. Importantly, the institution needs to assess employee turnover intention and regularly take corrective actions. On the other hand, employees should be proactive in developing and maintaining a positive attitude at work and pursuing a planned career development.

REFERENCES

[1] A. Iqbal, "Employee Turnover: Causes, Consequences and Retention Strategies in the Saudi Organizations," Bus Rev Cambr, vol. 16, no. 2, pp. 275–281, 2010. [Online]. Available: https://api.semanticscholar.org/CorpusID:37223342.

[2] S. M. Ogony and B. K. Majola, "Factors causing employee turnover in the public service, South Africa," J Manag Admin, vol. 2018, no. 1, pp. 77–100, 2018/09/01 2018, doi: 10.10520/EJC-110784ed03.

[3] S. K. Collins, R. C. McKinnies, E. P. Matthews, and K. S. Collins, "A Ministudy of employee turnover in US hospitals," (in eng), Health Care Manag, vol. 34, no. 1, pp. 23–27, Jan-Mar 2015, doi: 10.1097/hcm.0000000000000038.

[4] W. G. Bliss, "Costs of employee turnover," The Advisor. [Online]. Available: http://www.isquare.com/turnover.cfm

[5] J. Duda and L. Žůrková, "Costs of employee turnover," Acta Univ Agric Silvic Mendel Brun, vol. 61, pp. 2071–2075, 2013, doi: 10.11118/actaun201361072071.

[6] D. S. Contino, "How to slash costly turnover," Nurs Manag, vol. 33, no. 2, pp. 10–13, 2002, doi: 10.1097/00006247-200202000-00003.

[7] J. Bersin, "Employee retention now a big issue: Why the tide has turned," Bersin by Deloitte, vol. 16, pp. 1–4, 2013. [Online]. Available: https://bobmorris.biz/josh-bersin-on-employee-retention-is-now-a-big-issue-why-the-tide-has-turned.

[8] I. Biletta et al., "Working conditions and sustainable work: An analysis using the job quality framework," in "Challenges and prospects in the EU series," European Union, Luxembourg, 2021. Accessed: 2024-04-16. [Online]. Available: http://eurofound.link/ef20021

[9] P. B. Ruiz, M. G. Perroca, and M. d. C. Jericó, "Cost of nursing turnover in a Teaching Hospital," Rev Esc Enferm USP, vol. 50, no. 1, pp. 101–108, 2016, doi: http://dx.doi.org/10.1590/S0080-623420160000100014.

[10] H. G. Heneman and T. A. Judge, Staffing Organizations, 9th ed. Columbus: McGraw-Hill Higher Education, 2019.

[11] P. C. Bimenyimana, A. H. Abay, and H. Lee, "Exploring the Effects of Human Resource Development to Reduce Turnover Intention and Turnover in Public Sector: Comparative Case Study of Korea, Ethiopia, and Rwanda," East Afr J Bus Econ, vol. 3, no. 1, pp. 14–27, 2021, doi: https://doi.org/10.37284/eajbe.3.1.284.

[12] Rwanda Public Service Commission (PSC), "Assessment of Citizens' Satisfaction on Recruitment Practices in Rwandan Public Institutions," PSC, Kigali, 2013.

[13] Rwanda Ministry of Public Service and

Labour (MIFOTRA), "Rwanda Public Sector Pay and Retention Policy and Implementation Strategy," MIFOTRA, Kigali, 2012. [Online]. Available: https://www.npsc.gov.rw/home-1/updates/news-detail/citizen-satisfaction-survey-iii-on-recruitment-practices-in-public-institutions
[14] Rwanda Ministry of Health, "Health labour market analysis report," Rwanda Ministry of Health, Kigali, 2019.
[15] COHSASA Accreditation Standards, The Council for Health Service Accreditation of Southern Africa (COHSASA), Cape Town, 2015. [Online]. Available: https://cohsasa.co.za/
[16] L. Cabral, "Good turnover and bad turnover: Barriers to business and productivity," Econ Lett, vol. 125, no. 2, pp. 179–181, 2014/11/01/ 2014, doi: https://doi.org/10.1016/j.econlet.2014.08.022.
[17] M. Heidari, B. Seifi, and Z. A. Gharebagh, "Nursing staff retention: effective factors," (in English), Ann Trop Med Public Health, vol. 10, no. 6, pp. 1467–1473, 2017, doi: 10.4103/ATMPH.ATMPH_353_17.
[18] M. T. Tran, J. Zhang, M. Chikaraishi, and A. Fujiwara, "A joint analysis of residential location, work location and commuting mode choices in Hanoi, Vietnam," J Transp Geogr, vol. 54, pp. 181–193, 2016/06/01/ 2016, doi: https://doi.org/10.1016/j.jtrangeo.2016.06.003.
[19] A. Wöcke and M. Heymann, "Impact of demographic variables on voluntary labour turnover in South Africa," Int J Hum Resour Manag, vol. 23, no. 16, pp. 3479–3494, 2012/09/01 2012, doi: 10.1080/09585192.2011.639028.
[20] A. Binagwaho et al., "Creating a pathway for public hospital accreditation in Rwanda: progress, challenges and lessons learned," Int J Qual Health Care, vol. 32, no. 1, pp. 76–79, 2020, doi: 10.1093/intqhc/mzz063.
[21] Y. Xiaoming, B.-J. Ma, C. L. Chang, and C.-J. Shieh, "Effects of workload on burnout and turnover intention of medical staff: A study," Ethno Med, vol. 8, no. 3, pp. 229–237, 2014. [Online]. Available: https://www.cabidigitallibrary.org/doi/full/10.5555/20153045411.
[22] S. Jha, "Determinants of employee turnover intentions: A review," Manag Today, vol. 9, no. 2, 2009. [Online]. Available: https://papers.ssrn.com/sol3/papers.cfm?abstract_id=2442689.
[23] R. Ravangard, S. Dianat, and N. Shokrpour, "The Factors Affecting Hospital Employees' Turnover Intentions: A Case of Iran," Health Care Manag, vol. 38, no. 2, pp. 166–178, 2019, doi: 10.1097/HCM.0000000000000258.
[24] Y. R. Poon, Y. P. Lin, P. Griffiths, K. K. Yong, B. Seah, and S. Y. Liaw, "A global overview of healthcare workers' turnover intention amid COVID-19 pandemic: a systematic review with future directions," (in eng), Hum Resour Health, vol. 20, no. 1, p. 70, Sep 24 2022, doi: 10.1186/s12960-022-00764-7.
[25] H. Hou et al., "Factors Associated with Turnover Intention Among Healthcare Workers During the Coronavirus Disease 2019 (COVID-19) Pandemic in China," (in eng), Risk Manag Healthc Policy, vol. 14, pp. 4953–4965, 2021, doi: 10.2147/rmhp.S318106.
[26] J. Stowers, "Employee Retention: What Does Your Turnover Rate Tell You?," Business.com, 2023/02/21. [Online]. Available: https://www.business.com/articles/employee-turnover-rate/
[27] D. P. Taylor, "How to Calculate Your Employee Turnover Rate," The Ascent, 2022 May 18. [Online]. Available: https://www.fool.com/the-ascent/small-business/human-resources/articles/turnover-rate/
[28] G. Ndila, "Staff retention and organization performance in King Faisal Hospital Kigali Rwanda," BSc., Kampala International University, Kampala, 2013. [Online]. Available: https://ir.kiu.ac.ug/items/43b902c0-07b7-4d47-8dfb-a595577f1a0d
[29] Rwanda Ministry of Health, "Health Sector Policy: 2010–2013," Rwanda Ministry of Health, Kigali, 2014.
[30] J. Odhiambo et al., "Health worker attrition at a rural district hospital in Rwanda: a need for improved placement and retention strategies," The Pan African Medical Journal, vol. 27, no. 1, p. 168, 2017, doi: 10.11604/pamj.2017.27.168.11943.
[31] K. Goetz et al., "Working Atmosphere and Job Satisfaction of Health Care Staff in Kenya: An Exploratory Study," (in eng), Biomed Res Int, vol. 2015, p. 256205, 2015, doi: 10.1155/2015/256205.
[32] B. K. Frogner and J. S. Dill, "Tracking Turnover Among Health Care Workers During the COVID-19 Pandemic: A Cross-sectional Study," JAMA Health Forum, vol. 3, no. 4, pp. e220371–e220371, 2022, doi: 10.1001/jamahealthforum.2022.0371.
[33] L. R. Men, "Strategic Internal Communication: Transformational Leadership, Communication Channels, and Employee Satisfaction," Manag Commun Q, vol. 28, no. 2, pp. 264–284, 2014/05/01 2014, doi: 10.1177/0893318914524536.

[34] L. R. Men and C. A. Yue, "Creating a positive emotional culture: Effect of internal communication and impact on employee supportive behaviors," Public Relat Rev, vol. 45, no. 3, p. 101764, 2019/09/01/ 2019, doi: https://doi.org/10.1016/j.pubrev.2019.03.001.

Review

Open Access

Bridging the Gap: Fostering the Positive Impact of Expanding Medical Training Facilities on Rwanda's Rural Healthcare: A review

Yves Gashugi[1,2,*], Ernestine Kanyana[2], Louange Bienvenu Byiringiro[3], Janvier Rukundo[3], Benigne Aurea Dushime[1], Josias Izabayo[4]

[1]*Rwanda Psychological Society, Kigali, Rwanda.*
[2]*University of Global Health Equity, Butaro, Rwanda.*
[3]*Rwanda- Food and Drug Authority, Kigali, Rwanda.*
[4]*College of Medicine and Health Sciences (CMHS), University of Rwanda, Kigali, Rwanda.*

***Corresponding author:**
Yves Gashugi
University of Global Health Equity, Butaro, Rwanda
Email: gashuyves1998@gmail.com
ORCID: https://orcid.org/0000-0002-1976-6693

Received: January 13, 2025
Accepted: March 25, 2025
Published: March 31, 2025

Cite this article as: Gashugi et al. Bridging the Gap: Fostering the Positive Impact of Expanding Medical Training Facilities on Rwanda's Rural Healthcare: A review. *Rw. Public Health Bul. 2025. 6 (1): 43-49.* https://dx.doi.org/10.4314/rphb.v6i1.3

ABSTRACT

Rural healthcare disparities in Rwanda remain a critical challenge, driven by insufficient infrastructure, a shortage of trained healthcare professionals, and geographical isolation. This manuscript explores the transformative potential of expanding medical training facilities to address these inequities. With only 0.118 physicians per 1,000 people as of 2019, Rwanda falls far below the World Health Organization (WHO)'s recommended ratio. Current initiatives, such as the "4X4" strategy, aim to scale up the healthcare workforce and address rural challenges, yet gaps persist.

Drawing lessons from successful global models, including India's district-based medical colleges, Ethiopia's rural health extension programs, and South Africa's rural clinical training programs, the manuscript contextualizes their relevance to Rwanda. Expanding training facilities in rural areas would enhance healthcare access, reduce patient-to-provider ratios, and improve outcomes in maternal and neonatal care, chronic disease management, and preventive health services. The positive impacts extend beyond healthcare delivery, contributing to economic empowerment through job creation and fostering retention of locally trained professionals in underserved areas. By prioritizing strategic investments in rural medical education and supporting measures such as scholarships and career incentives, Rwanda can build a resilient, community-centered healthcare system.

This work advocates for immediate action to expand training facilities, emphasizing their role in bridging rural healthcare gaps, enhancing service quality, and empowering communities. It envisions Rwanda as a place where equitable healthcare access is a reality, uplifting rural regions and ensuring a healthier, more productive population.

INTRODUCTION

Access to quality healthcare remains a persistent challenge in Rwanda and other low-income countries, particularly in rural areas. Despite global advancements in healthcare, rural communities in Rwanda face significant disparities in accessing essential medical services due to insufficient infrastructure, limited personnel, and geographical isolation [1].

While the country's healthcare system has made strides through initiatives such as community-based health insurance and decentralization of health services, critical gaps persist in underserved regions. Notably, as of 2019, Rwanda had approximately 0.118 physicians per 1,000 people, equating to one doctor for every 8,475 individuals [2]. This figure falls well below the World Health Organization's (WHO) recommended minimum of one doctor per 1,000 people [3]. In response, Rwanda's Ministry of Health launched the "4X4" initiative, aiming to quadruple the number of medical doctors within four years to achieve a ratio of four doctors per 1,000 patients [4]. However, the scarcity of adequately trained medical professionals in rural areas remains a significant barrier to achieving equitable healthcare outcomes. This scarcity exacerbates challenges such as high patient-to-provider ratios, limited specialized care, and poor health indicators, particularly in rural regions [5,6].

Globally, investments in expanding medical education and training facilities, particularly in rural regions, have proven effective in addressing such disparities. For example, India has established district-based medical colleges, increasing the availability of healthcare professionals in remote areas and significantly reducing maternal and infant mortality rates [7]. Similarly, Ethiopia's rural health extension programs emphasize training and deploying health workers within their communities, leading to substantial gains in preventive care and health education [8]. In South Africa, rural clinical training programs have successfully encouraged healthcare professionals to remain in underserved regions, thereby enhancing service delivery and health outcomes [9].

Here we explored transformative potentials of expanding medical training facilities in Rwanda's rural areas. Analyzing successful global practices and contextualizing their application to Rwanda's unique healthcare challenges advances the discourse on equitable healthcare development and highlights the role of rural empowerment in addressing disparities.

CURRENT CHALLENGES IN RWANDA'S RURAL HEALTHCARE

Physician Shortage: Rwanda faces a significant shortage of healthcare professionals, a challenge that disproportionately affects rural areas as approximately 72.1% of the population resides in rural areas [10]. According to the National Institute of Statistics of Rwanda (NISR), the country has only 0.118 physicians per 1,000 people, translating to one doctor for every 8,475 individuals [2; 11]. This figure is far below the World Health Organization's recommended standard of one doctor per 1,000 people [3]. The disparity is further pronounced between urban and rural areas, with most doctors and specialists concentrated in cities such as Kigali. While a disparity in healthcare access between urban and rural areas still exists—with doctors and specialists more commonly concentrated in cities like Kigali—efforts are underway to address this imbalance. Staffing challenges in rural regions, often influenced by limited career development opportunities, infrastructure gaps, and demanding living conditions, are being recognized as priority areas for improvement. Ongoing initiatives aim to create more supportive environments to attract and retain medical professionals across all regions [5].

Infrastructure and Accessibility: The healthcare infrastructure in rural Rwanda remains underdeveloped, with many facilities lacking essential equipment and medical supplies. According to the Ministry of Health, only 60% of rural health centers meet minimum standards for infrastructure and staffing, leaving large segments of the population underserved [12]. Residents in remote areas often have to travel more than 20 kilometers to access basic healthcare services, a challenge exacerbated by inadequate public transport options and poor road networks [1]. Research emphasizes that this geographical isolation delays access to care and deters residents from seeking preventive and emergency services, increasing the burden of untreated conditions [13]. Additionally, the lack of specialized care in rural health centers means patients requiring advanced treatment must rely on referral hospitals, further straining an already overwhelmed urban healthcare system.

Impact on Rural Communities: The scarcity of medical professionals and limited access to infrastructure have dire consequences for rural communities. High rates of preventable diseases, such as malaria, diarrheal diseases, and respiratory infections, remain prevalent in these areas. Maternal and child mortality rates are disproportionately

higher in rural Rwanda compared to urban areas due to limited access to skilled birth attendants and emergency obstetric care [14]. Rural women often face barriers to accessing timely cesarean sections or antenatal care, contributing to preventable complications during childbirth.

Rwanda has been facing a significant shortage of healthcare professionals, which has contributed to the underdiagnosis and limited treatment of chronic illnesses such as diabetes and hypertension. However, this challenge is being actively addressed through various national initiatives aimed at expanding medical training, increasing recruitment, and improving the distribution of healthcare workers across the country. Rural populations often seek care only when conditions become critical, resulting in poorer outcomes and higher healthcare costs [15]. This persistent gap perpetuates cycles of poverty as families bear the financial burden of traveling long distances for care and managing the consequences of untreated illnesses.

RWANDA'S EXISTING EFFORTS AND OPPORTUNITIES

4X4 Initiative: Scaling the Healthcare Workforce: Rwanda's "4X4 Initiative" aims to quadruple the number of medical doctors within four years to achieve a ratio of four doctors per 1,000 people, addressing the country's significant shortage of healthcare professionals [4]. Achieving this goal requires the expansion of medical training facilities, particularly in rural areas, to increase the number of healthcare workers and ensure their equitable distribution across underserved regions. Aligning infrastructure development with the 4X4 Initiative enables Rwanda to not only boost the number of medical professionals but also prepare them to address the unique challenges of rural healthcare effectively. Notably, Rwanda has taken significant steps toward this objective. For example, the University of Global Health Equity (UGHE), established in partnership with Partners in Health, trains medical students with a strong emphasis on delivering healthcare services to underserved populations, particularly in rural communities.

Community-Based Health Insurance (CBHI): Enhancing Care Delivery: The CBHI program has enhanced access to affordable healthcare, but its sustainability hinges on a robust healthcare workforce. Expanding medical training facilities is critical to sustaining CBHI by increasing the availability of skilled providers. Contributions to CBHI are structured according to socio-economic categories, making the scheme inclusive and affordable [16]. Expanding education and integrating it with CBHI-supported centers ensures the growing demand for quality services is met.

Opportunities: Leveraging Technology and Partnerships: Rwanda's leadership in technological innovation offers opportunities to revolutionize medical education through tools like telemedicine, simulation-based training, and virtual reality modules. Additionally, the country's global partnerships with organizations such as the World Bank and African Development Bank can support the establishment of state-of-the-art rural medical schools. Drawing on successful models from countries like Ethiopia and India, Rwanda can use these collaborations to build modern training facilities that address healthcare gaps, enhance workforce retention, and improve rural healthcare outcomes.

LESSONS FROM OTHER LOW- AND MIDDLE-INCOME COUNTRIES AND RELEVANCE TO RWANDA

Drawing insights from countries like India, Ethiopia, and South Africa provides valuable lessons for addressing rural healthcare disparities. India's establishment of district-based medical colleges has significantly improved access to healthcare by training professionals familiar with rural health challenges [7]. These institutions have been instrumental in reducing maternal and infant mortality rates by ensuring healthcare providers are available in underserved areas. Similarly, Ethiopia's rural health extension programs focus on training community-based health workers in preventive care and basic clinical services, leading to substantial improvements in maternal health and the management of communicable diseases [8]. South Africa's rural clinical training programs immerse medical students in rural settings during their education, fostering long-term service in underserved areas and enhancing healthcare outcomes.

For Rwanda, these models offer actionable strategies. Establishing district-based medical

colleges, similar to India's approach, could train healthcare workers near their communities while emphasizing maternal and neonatal care. Adapting Ethiopia's community-based health worker training programs [8] would help improve preventive care and health education in rural areas. South Africa's immersive rural clinical training aligns with Rwanda's goals of retaining healthcare professionals in underserved regions. By contextualizing these strategies to Rwanda's specific needs, the country can strengthen its healthcare system, improve service delivery, and move closer to achieving equitable healthcare access.

POSITIVE IMPACTS OF EXPANDING MEDICAL TRAINING FACILITIES

Improved Access to Healthcare to Address the Doctor-Patient Gap: Expanding medical training facilities is crucial for addressing healthcare accessibility in underserved regions, particularly rural areas. Increased training opportunities lead to a larger healthcare workforce, ensuring that rural residents no longer need to travel great distances for basic services. This effort aligns with findings that highlight the importance of decentralizing healthcare education to reduce regional disparities [17]. Countries like Ethiopia and India have demonstrated the effectiveness of increasing training facilities in improving healthcare access [8]. Similarly, in Rwanda, expanding these facilities could serve as a crucial step toward bridging the doctor-patient gap and ensuring equitable access to healthcare services.

Enhanced Quality of Care: A larger and better-trained healthcare workforce results in improved quality of care. Reduced patient-to-provider ratios allow healthcare workers to focus more on individual patients, enhancing diagnostic accuracy and treatment outcomes. Moreover, specialized training programs in areas like maternal health and chronic disease management bring advanced care to underserved regions. Trainees who study and train in rural areas are more likely to gain firsthand experience with the unique challenges these communities face, such as limited infrastructure, cultural barriers, and resource constraints. In countries like South Africa, rural clinical training programs have successfully prepared medical professionals to work in underserved areas by exposing them to rural healthcare settings during their education [9]. Similarly, in Rwanda, decentralizing training could provide students with the necessary skills to navigate the specific demands of rural healthcare, fostering a deeper understanding of community needs and a greater sense of commitment to addressing them.

Economic Empowerment: The expansion of medical training facilities drives economic empowerment by creating employment opportunities and improving overall health outcomes. For rural areas, these facilities stimulate local economies through job creation for trainers, administrators, and healthcare workers. Healthier populations contribute to a more productive workforce and reduce financial strains on families [17]. Additionally, these improved health outcomes lead to decreased healthcare expenses, freeing up resources for education and entrepreneurship. For instance, programs in Ethiopia have shown that expanding healthcare infrastructure not only addresses immediate health needs but also fosters long-term economic stability [8].

Retention of Healthcare Workers: Locally trained medical professionals are more likely to remain in and serve the communities where they were educated. Studies in low-income countries consistently show that medical professionals trained in rural areas are more likely to work in those areas after completing their education compared to those trained in urban centers [18]. For Rwanda, this means that expanding medical training facilities to rural regions could ensure a steady supply of healthcare workers committed to long-term service in these underserved areas. In addition, retaining healthcare workers in rural regions helps build trust between communities and medical professionals, improving healthcare outcomes through consistent, culturally sensitive care. By creating incentives for rural training and professional development, Rwanda can foster healthcare stability and sustainability in its most vulnerable regions.

Preventive Care and Community Outreach: Training healthcare workers to focus on preventive care and community outreach further reduces the burden of preventable diseases. Health professionals trained in public health education can lead vaccination campaigns, sanitation programs, and nutrition counseling in rural areas. Integrating preventive care into medical training ensures that

healthcare systems are equipped to address root causes rather than just symptoms [19]. Proactive community engagement by healthcare workers has a lasting impact on reducing disease prevalence in rural communities [13].

For Rwanda, expanding rural-focused medical training facilities offers a transformative opportunity to address the healthcare challenges in underserved areas. Rural regions disproportionately bear the brunt of healthcare disparities, with residents often traveling long distances to access limited services, compounded by socioeconomic constraints [20]. Establishing and strengthening medical training facilities in rural areas can help foster locally trained professionals who are more likely to remain in and serve their communities. This approach not only meets immediate healthcare needs but also builds long-term capacity and resilience within the rural healthcare system.

By combining insights from multiple scholars, these points underscore the transformative impact of expanding medical training facilities. Such efforts improve healthcare access and quality, drive socio-economic development, and foster sustainable healthcare systems, particularly in regions like rural Rwanda.

CALL TO ACTION

Education and training are transformative forces essential for improving rural healthcare. By equipping individuals with the knowledge and skills to address healthcare challenges, education serves as a powerful catalyst for change, fostering resilience and ensuring sustainable solutions developed from within communities.

Rwanda has made commendable strides in this direction, particularly through its collaboration with Partners in Health to establish the UGHE. This institution exemplifies a commitment to equitable healthcare delivery, especially in rural areas. Building on this success, Rwanda has the opportunity to expand community-oriented training programs in additional medical schools. Integrating education for paramedic and mid-level healthcare professionals would cultivate a diverse and skilled workforce capable of addressing a wide spectrum of medical needs in underserved regions.

Now is the time for immediate and strategic investment in expanding medical training facilities to bridge rural healthcare disparities. Establishing more medical schools and training centers in rural areas, coupled with community-based training models and paramedic education, would produce healthcare workers with a deep understanding of the unique challenges these communities face. To attract and retain talent in these regions, supportive measures such as scholarships, housing, and career advancement opportunities must also be prioritized.

The vision is clear: a Rwanda where rural communities have equitable access to quality healthcare. In the future, no one will need to travel long distances for basic medical services, and preventable health challenges will be drastically reduced. By building a well-trained and widely distributed healthcare workforce supported by enhanced training facilities, even the most remote regions will benefit from exceptional medical care. This transformation will not only improve health outcomes but also empower communities, fostering a healthier and more productive population.

CONCLUSION

Expanding medical training facilities in Rwanda represents a transformative solution to bridging healthcare disparities in rural areas. By addressing critical challenges such as the shortage of skilled healthcare professionals, underdeveloped infrastructure, and limited accessibility, these efforts can significantly enhance healthcare access, quality, and outcomes. Building on initiatives like the "4X4" strategy and leveraging successes such as the UGHE, Rwanda has a unique opportunity to empower rural communities through education and training. This approach not only improves health outcomes but also drives economic growth, fosters workforce retention, and ensures a more equitable healthcare system. A coordinated investment in rural medical education and infrastructure will pave the way for a healthier, more resilient Rwanda, where no community is left behind.

REFERENCES

[1] R. Kanyange, D. Uwizeye, E. Kantarama, and R. M. Gyasi, "Leaving no one behind in informal urban settlements: A qualitative study of access

to healthcare services among the urban poor in Kigali, Rwanda," Rwanda Journal of Social Sciences, Humanities, and Business, vol. 3, no. 1, 2024. [Online]. Available: https://www.ajol.info/index.php/rjsshb/article/view/265713/250733.

[2] IndexMundi, "Rwanda - Physicians (per 1,000 people)," 2019. [Online]. Available: https://www.indexmundi.com/facts/rwanda/indicator/SH.MED.PHYS.ZS.

[3] World Health Organization, "The density of doctors (physicians) per 10,000 population," 2022. [Online]. Available: https://data.who.int/indicators/i/CCCEBB2/217795A. [Accessed: Dec. 23, 2024].

[4] KT Press, "Rwanda aims for four doctors per thousand patients," 2024. [Online]. Available: https://www.ktpress.rw/2024/01/rwanda-aims-for-four-doctors-per-thousand-patients.

[5] O. O. Oleribe, J. Momoh, B. S. Uzochukwu, F. Mbofana, A. Adebiyi, T. Barbera, R. Williams, and S. D. Taylor-Robinson, "Identifying key challenges facing healthcare systems in Africa and potential solutions," Int. J. Gen. Med., vol. 12, pp. 395–403, 2019, doi: 10.2147/IJGM.S223882.

[6] O. Selden, E. Rusingiza, and R. Balkrishnan, "Overview, Infrastructural Challenges, Barriers to Access, and Progress for Rwanda's Healthcare System: A Review," Int. J. Med. Stud., vol. 12, Feb. 2025. https://doi.org/10.15342/ijms.2025.745.

[7] Y. Sabde, V. Diwan, V. K. Mahadik, et al., "Medical schools in India: pattern of establishment and impact on public health - a Geographic Information System (GIS) based exploratory study," BMC Public Health, vol. 20, p. 755, 2020. https://doi.org/10.1186/s12889-020-08797-0.

[8] T. A. Zerfu, A. A. Tareke, and S. Biadgilign, "Challenges and experience of the Ethiopian rural health extension program: implications for reform and revitalization," BMC Health Services Research, vol. 23, p. 1309, 2023. https://doi.org/10.1186/s12913-023-10253-9.

[9] D. M. Gumede, M. Taylor, and J. D. Kvalsvig, "Engaging future healthcare professionals for rural health services in South Africa: students, graduates and managers perceptions," BMC Health Services Research, vol. 21, p. 220, 2021. https://doi.org/10.1186/s12913-021-06178-w.

[10] National Institute of Statistics of Rwanda, "Rwanda Statistical Yearbook 2019," Kigali, Rwanda, 2019. [Online]. Available: https://www.statistics.gov.rw/publication/

[11] National Institute of Statistics of Rwanda, "Rwanda's population reaches 13.2 million in 2022," Kigali, Rwanda, 2022. [Online]. Available: https://www.statistics.gov.rw/publication/Rwanda_population_2022.

[12] Ministry of Health, "Rwanda Annual Health Statistics Booklet 2020," Kigali, Rwanda, 2020. [Online]. Available: https://www.moh.gov.rw/fileadmin/user_upload/Moh/Publications/Reports/Health_Sector_Annual_Performance_Report_2020-2021.pdf

[13] S. T. Syed, B. S. Gerber, and L. K. Sharp, "Traveling towards disease: transportation barriers to health care access," Journal of Community Health, vol. 38, no. 5, pp. 976–993, 2013. https://doi.org/10.1007/s10900-013-9681-1.

[14] National Institute of Statistics of Rwanda (NISR), "Mortality in Rwanda," Kigali, Rwanda, 2021. [Online]. Available: https://statistics.gov.rw/sites/default/files/publications/6093d49d-0013-4363-9cdf-ff6eb1a84ed8/Mortality.pdf.

[15] Ballard Brief, "Healthcare access in rural communities in India," Ballard Brief, 2023. [Online]. Available: https://ballardbrief.byu.edu/issue-briefs/healthcare-access-in-rural-communities-in-india#:~:text=+%20Key%20Takeaways,pay%20for%20necessary%20medical%20treatment

[16] Rwanda Social Security Board (RSSB). (2023). Community-Based Health Insurance (CBHI): An Overview. Retrieved from https://www.shareweb.ch/site/Health/Slides%20%20SDC%20Health%20F2F%202023/Rwanda%20Social%20Security%20Board%20RSSB.pdf

[17] World Health Organization, Increasing access to health workers in remote and rural areas through improved retention: global policy recommendations. Geneva, Switzerland: WHO Press, 2010. [Online]. Available: https://iris.who.int/bitstream/handle/10665/44369/9789241564014_eng.pdf.

[18] World Health Organization, Increasing Access to Health Workers in Remote and Rural Areas Through Improved Retention: Global Policy Recommendations. Geneva, Switzerland: WHO, 2010. [Online]. Available: https://www.ncbi.nlm.nih.gov/books/NBK138626/#:~:text=Summary%20of%20the%20evidence%20Large%20observational%20studies,in%20rural%20areas%20than%20urbanely%20located%20schools.

[19] Ministry of Health Rwanda, Rwanda National NCD Strategy and Costed Action Plan 2020–2025.

Kigali, Rwanda: MoH, 2021. [Online]. Available: https://www.moh.gov.rw/fileadmin/user_upload/Moh/Publications/Strategic_Plan/Rwanda_National_NCD_Strategy_Costed_Action_Plan_FINAL_12072021.pdf.
[20] A. Ndikubwimana, E. Matsiko, C. Kamanzi, A. Umubyeyi, D. Chisare, and L. Kanya, Strengthening Rwanda's Health Workforce: Strategies to Improve Retention in the Health Sector, AHOP Policy Briefs, 2024. [Online]. Available: https://iris.who.int/bitstream/handle/10665/380383/9789290314264-eng.pdf.

Rwanda
Public Health Bulletin

About the Rwanda Public Health Bulletin (RPHB)

The Rwanda Public Health Bulletin (RPHB) is a printed and open access, peer-reviewed journal, published as the flagship scientific and technical periodical publication. RPHB is a public health bulletin launched in March 2019 by the Rwandan Ministry of Health, through the Rwanda Biomedical Centre (RBC) in collaboration with the CDC Foundation and with support from Bloomberg Philanthropies Data for Health Initiative.

Mission

To serve as a scientific information dissemination platform of national and international significance, mainly in areas related to the Rwanda Ministry of Health's essential mission to strengthen national and local health systems and improve the health of the people of Rwanda. The Rwanda Public Health Bulletin publishes disease surveillance summaries, public health response guidelines, public health notices, case reports, outbreak reports, original research papers, and policy briefs among others. It generally features issues of importance to its targeted audience, which is health professionals, academic researchers, policymakers and anybody interested in health issues. Articles for publication are received from doctors, nurses, allied health professionals, students, policymakers, government bodies, non-governmental bodies and others.

Aim

To bridge the gap in public health information sharing between policymakers, researchers, health professionals and practitioners.

Publisher

RPHB is a publication of the Rwanda Health Communication Centre (RHCC) which is the communication arm of the Rwanda Ministry of Health and operating under the Rwanda Biomedical Centre (RBC).

Registration

Online ISSN: 2663 - 4651, Print ISSN: 2663 - 4643

Rwanda
Public Health Bulletin

INSTRUCTIONS TO AUTHORS

All works submitted to this bulletin will have to belong to the types of articles stated below:

1. ORIGINAL RESEARCH

Referred to as "Primary Research" pioneer in a determined domain. It can be from various aspects: Clinical features, pathophysiology, biochemistry, molecular biology, etc.

THE TITLE

The title of the article should be concise and informative. It should contain enough thoughts on the subject.

ABSTRACT

Abstract of 250 words maximum must accompany each manuscript and be divided into 4 paragraphs with the following headings and MeSH keywords:

Introduction: stating the purposes/aims of the work; the research undertaken, the hypothesis tested or the procedure evaluated.
Materials and methods: briefly stating what was done and what materials were used, including the number of subjects, the methods to assess the data and to control bias.
Results: Providing key findings of the study, including indicators of statistical significance, actual numbers, as well as percentages.
Conclusion: Summarizing in 1 or 2 sentences the work on the basis of the findings. It emphasizes new and important aspects of the study or observations.

THE MAIN TEXT

The text of observational and experimental articles is divided into sections with the following headings: Introduction: should always begin the text, and requires brevity and focuses. It conveys the nature and purpose of the work, and quotes the relevant literature. Only strictly pertinent background information is necessary for understanding why the topic is important. We suggest the final paragraph clearly states the hypothesis or purpose of the study.

METHODS

Details of clinical and technical procedures should follow the introduction. A clear description of the selection of the observational or experimental subjects should be given. The identification of all aspects of the study, its reasoning, and the related relevance should be explicitly justified. In case, the study was done in a particular way, the guiding principles should all be clarified. Exclusion and inclusion criteria or partial inclusion, the reliability index, the confidentiality index, the analysis step, and the data collection processes should be also carefully specified. This section should provide sufficient details on the methods, instrumentation, procedures, all drugs and chemicals used (including generic names, doses, routes of administration). It should allow other workers to reproduce the study if necessary.
This section should also state the self-evaluation of the study by: independent/consensus readings blinded or unblinded to other information and estimate the fluctuation of recall biases by random ordering of studies.

Be clear about the retrospective or prospective nature of the study. Finally, provide references to established methods, including statistical methods that have been published, forthcoming, or that may not be well known. New description or substantially modified methods may be used however, give reasons for the use of these techniques, and evaluate their limitations. Statistical methods should be described with enough details to enable a knowledgeable reader with access to the original data to verify the reported results. A general description of methods would be defined in the methods section, whereas a specific statistical method used into analysis would be summarized in the results section. Any general use of the computer program should be

specified, and more details have to be clarified about any randomization issues.

RESULTS

Logical sequence of presentation of results is required in the text; along with tables, and illustrations. Repetition of data from illustrations into the text should be avoided; however, emphasize or summary of only important observations would be helpful. Avoid the ‘’non-technical use’’ of technical terms in statistics which should be defined and reserved for the right purpose. Moreover, define all those statistical terms aside with or including abbreviations and/or most used symbols. Any complication and/or unexpected finding should be reported and the more possibly explained and the author should report lost to follow up and dropouts from a clinical trial.

DISCUSSION

Use ample subheadings. Emphasize the new and important aspects of the study and the conclusions that follow from them. Avoid repetition of details included in other parts. This section requires the mention of the implication of the findings, and their limitations for future research, involving relating the observations to other relevant studies.

Finally, the conclusions should be linked to the goals of the study; though mostly avoiding:

Unqualified statement not completely supported by the data

Statement on economic benefits and costs unless the report includes economic data and analyses

Claim of priority and alluding to work that has not been completed.

Whereas new hypotheses could be suggested when warranted, but they should be clearly labeled as such and recommendations, when appropriate and needed, may be given.

Acknowledgments

List all contributors who do not meet the criteria of authorship, such as those who provided purely technical help, writing assistance, or a department chair who provided only general support; and their respective contribution will be headed as provided. Everybody must have given written permission to be acknowledged. References: References should be numbered consecutively in the order in which they were first mentioned in the text. They will be identified in the text, tables, and legends by arabic numbers. This bulletin uses the IEEE style (Institute of Electrical and Electronics Engineers) for referencing the citations. It is advised to avoid citations or personal communication unless they provide essential and pertinent information. In all case, the name of the person and date of communication should be cited in parentheses in the text.

2. CHECKLIST FOR SURVEILLANCE REPORTS

Disease surveillance summaries are reported following the checklist below:
Title: Compose a title that includes the name of the health condition, population, time and place.
Abstract: Provide a structured abstract including the following sub- headings: Background; Objectives; Methods; Results; and Conclusion.

INTRODUCTION

Context: Summarize the current situation regarding the health condition under surveillance and identify why it is important. Objectives: State the objective of the surveillance report.

METHODS

Setting: Describe the setting, locations and dates of the surveillance period.
Population: Describe the population under surveillance. Definitions: Provide definitions for each health event under surveillance, including

case definitions and any public health interventions. **Information sources**: Describe all data sources, including the objective of any surveillance systems, what data were collected and how data were gathered, transferred and stored. Supplementary data: If appropriate, note where to access supplemental material (e.g., www.opendata.gc.ca). **Data quality, missing data and reporting delays:** Describe how the data quality was assessed. Explain how missing data were addressed. If data is reported by date of diagnosis or symptom onset, include a statement about whether the data for the most recent periods may be revised.

DATA ANALYSIS

Describe any analytical methods used providing sufficient detail to enable a knowledgeable reader with access to the original data to judge its appropriateness and to assess the reported results.

RESULTS

Descriptive: Provide a summary of the descriptive data, including demographics.
Data Quality: Report on data quality (e.g., completeness, missing data, under reporting)
Analytic data: Provide a summary of the analysis including (when indicated) estimates of trends. When applicable, point estimates should include appropriate indicators of measurement error such as 95% confidence intervals (e.g., average annual percentage change used to describe trends or odds ratios used to describe subgroup differences).
Figures: Create the minimum number of figures to highlight key results. Create a title that includes person, time and place.

DISCUSSION

Key results: Summarize key results with reference to study objectives
Comparison: Consider these findings in relation to the current literature. Strengths and weaknesses: Discuss the strengths and weaknesses of the study (data quality, completeness, sources of potential bias). Interpretation and generalizability: Provide a cautious overall interpretation of results considering objectives, limitations, multiplicity of analyses, results from similar studies and other relevant evidence.
Conclusion: Ensure conclusions address objectives and follow from the results.

3. PUBLIC HEALTH NOTICES / OUTBREAK REPORTS

Following the Center for Disease Control recommendations, for public heath notices and outbreak reports to be published they need to cover all four components as stated below:

INTRODUCTION

Generally, the introductory paragraph should begin with 1 to 3 sentences establishing the existence of the outbreak or underlying public health problem. E.g., "On January 2, 2008, the Nevada State Health Division contacted CDC concerning surveillance reports received regarding two persons recently diagnosed with acute hepatitis C." The introductory paragraph also usually contains: a) a statement that an investigation was conducted, when and by whom; b) the most important finding(s); c) the actions taken to stem the outbreak; and d) a statement of the public health implications and actions that should be taken in response to the investigation. Investigation and results: First, present the initial investigation and its findings. This might include: 1) a description of the setting and a statement of how the outbreak came to the attention of health authorities; 2) a clinical description of the index case or initial cases; 3) initial key test results; and 4) hypothesis generation activities and results. Next, summarize the full investigation, including: case definition, case-finding activities, method of investigation, and results. Cases should be counted and described by clinical characteristics, treatment, and outcome, as well as time, place, and person descriptive results. Next, present the methods and results of any analytic epidemiologic studies (e.g.,

cohort or case-control studies). Finally, provide the results of any relevant microbiologic, genetic, or toxicologic results, followed by the results of any testing of environmental samples. Public health response: When appropriate, a brief description summarizing any public health interventions taken and the results of the interventions follows.

DISCUSSION

Same as for a Full Report, except that a Limitations paragraph might not be required for an Outbreak Report.

4. POLICY BRIEFS

This bulletin will use guidelines on reporting/ publishing policy notes as they are suggested by the Center for Disease Control (CDC). As the CDC defines them; Policy Notes are intended to announce new official policies or recommendations (e.g., from ACIP or CDC). These reports can be thought of as briefs. Maximum word count at submission is 1,400 words. Up to three tables, figures, or boxes may be included. Policy Notes contain no Discussion or Limitations, and a summary box is not required. Although policy notes or brief might vary, following is a rough guide of what basic notes should have: Introduction: The introductory paragraph should be limited to 150–200 words. It might contain all or some of the following components: a brief introductory statement orienting the reader to the topic and placing it in context, a brief description of the public health problem, a brief statement of the rationale for the policy or recommendation, mention of the most important parts of the policy or recommendations, and one or two sentences stating the conclusions and the public health implications of the new policy or recommendations.

BACKGROUND

The Policy Note should include a paragraph after the introduction that summarizes background information relevant to the policy or recommendation that can help the reader understand the context and need for the policy or recommendation.

Methods: Should include a summary of the methods used to establish the policy or recommendation, including answers to some or all of these questions: Who was involved in the production of the guidelines or recommendations, and how? What evidence base was considered? What was the rationale for considering this evidence base? Was other evidence excluded from consideration and, if so, why? Rationale and evidence: The Policy Note should provide a concise review of the rationale for the policy or recommendation and a descriptive review of the scientific evidence used to establish it. It should include an explanation of how the policy or recommendation adds to, or differs from, relevant policies or recommendations established previously. Presentation of the policy or recommendation: The policy or recommendation should state clearly when it takes effect and to whom and under what circumstances it applies.

DISCUSSION OR COMMENT

The Policy Note should comment on the likely impact of the new policy or recommendation and plans for assessment of the policy or recommendation

5. CASE REPORTS

These are reports of an individual patient on their symptoms, treatment reactions on a disease or condition of interest. These reports normally focus on unusual reactions or occurrences. Similar cases to other research reports, case reports might include a literature review of previous similar. Case reports might also address positive patient outcome on particular treatment guidelines or individual impact of a particular intervention. These are mainly used for educational and decision-making purposes. Case reports are normally reported following a checklist found at the CARE Guidelines.

6. CASE STUDIES

We recommend authors to follow the "EQUATOR Network" for ample explanations and guidelines in the writing of such articles. They have to be well-described case studies on health care interventions of public health concern. These could be:

Rigorous assessments of processes and program interventions.

Recommendations on possible health interventions.

Never on individual patient (= case report)

7. COMMENTARIES / OPINION / METHODOLOGY ARTICLES

We recommend authors to follow the "EQUATOR Network" for ample explanations and guidelines in the writing of such articles. Though these articles are moderated, they should be:

Short, focused, opinionated to previous articles or any subject related to the journal entirely. Contemporary and focusing on specific issues. Normally up to 800 words.

Frank critics to the journal are bravely motivated and would be as much as possible published.

8. FORMATTING THE MANUSCRIPT

Please note that articles which are not correctly formatted will be returned to the authors

Format text: Style: No Spacing, Single column, Single Spacing
Font: Single Spacing, Times New Roman - size 12
Titles: Capitals and bold, size 14
Format tables: Times New Roman, Font size 9
No vertical lines. Horizontal lines in the table can be removed. No table should be larger than a single A4 page. Footnote should be size 9 and italic

Rwanda
Public Health Bulletin

Publisher

Rwanda Health Communication Centre.

Email: rwandapublichealthbulletin@gmail.com

Disclaimer

Opinions expressed in the "Rwanda Public Health Bulletin" are those of the authors and contributors; and do not necessarily reflect those of the Editorial Board or the Publisher. Authors hold sole responsibility of views expressed in their texts. The mention of specific companies or certain manufacturers' products does not imply that these are endorsed or recommended in preference to other ones of a similar nature.

Acknowledgement

This publication of Rwanda Public Health Bulletin (RPHB) was made possible by financial support from the Bloomberg Philanthropies Data for Health Initiative through the CDC Foundation. Its contents are solely the responsibility of the authors and don't necessarily represent the official views of Bloomberg Philanthropies, the CDC Foundation or the U.S. Centers for Disease Control and Prevention.