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HIGHLIGHTS

1. Thirty years of Rwanda's resilience and success following the 1994 genocide against Tutsi
2. Depression and anxiety among students
3. Determinants of early weaning of children
4. Knowledge, attitude, and practices towards prevention of TB among HIV-positive patients
5. Barriers to school health programs
6. Abdominal surgical emergencies in adults

Republic of Rwanda
Ministry of Health

Rwanda Biomedical Centre
Healthy People, Wealthy Nation

Rwanda
Public Health Bulletin

General Information

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Open Access

Dear readers,

As we commemorate the 30th anniversary of the 1994 genocide against the Tutsi, we find ourselves at a poignant intersection of remembrance, resilience, and reflection. This issue of the Rwanda Public Health Bulletin (RPHB) is released against the backdrop of profound historical significance and contemporary challenges, presenting a theme that resonates deeply with the ethos of our nation.

In the midst of honoring the memory of those we lost during one of the darkest chapters of our history, we are still confronted with the stark realities of mental health problems that test our collective strength and fortitude, with far-reaching impacts on health, society, and economy. These challenges have brought to the forefront the importance of mental health care and support.

Apart from our nation's historical challenges with a devastating impact, the recent COVID-19 pandemic has also not only tested our physical health, but it has also put a considerable strain on our mental health, particularly within our academic institutions where minds converge to shape the future of our nation. This was attributed to experienced increased stress, worry, and depression as a result of uncertainty, interruptions, and social isolation.

This publication showcases Rwanda's resilience and success against all challenges, becoming the beacon of hope by putting mental health care first and cultivating a resilient culture. It also highlights the persistent diverse perspectives and problems that our community members encounter, as well as depression and anxiety among university students following the COVID-19 pandemic. The articles in this issue lay the groundwork for informed interventions and support systems.

This RPHB issue also sheds light on early weaning of children and its influencing factors. Early weaning of children holds significant implications for child health and development, and understanding it could help promote good practices and educational interventions to support exclusive breastfeeding and healthy weaning practices.

As we deal with the consequences left by the 1994 genocide against Tutsi, cultivating a culture of empathy, resilience, and solidarity remains critical. By acknowledging and managing mental health problems in our communities, we reaffirm our commitment to the overall well-being of Rwandans. The lessons of resilience and unity that emerged from the aftermath of the genocide against Tutsi serve as guiding beacons as we confront the psychological toll while commemorating the lives lost.

I extend my gratitude to the researchers, scholars, and healthcare professionals whose unwavering commitment to advancing public health knowledge has enriched this publication. Their contributions not only deepen our understanding of mental health dynamics but also underscore the imperative of prioritizing holistic well-being in our pursuit of a better, more inclusive future for all Rwandans.

May this issue of the Rwanda Public Health Bulletin inspire and inform, developing a better awareness of the critical role data plays in shaping policies that benefit our communities.

Prof. Claude Mambo Muvunyi, MD, PhD
Editor-In-Chief -The Rwanda Public Health Bulletin (RPHB)
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Thirty years of Rwanda's resilience and success: a sign of hope for mental health recovery after the 1994 genocide against the Tutsi

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INTRODUCTION

Thirty years have passed since the 1994 genocide against the Tutsi, which decimated the country. However, Rwanda's story is not solely one of the traumas. It also demonstrates the continuing human capacity for resilience. While the effects of the genocide are undeniable, Rwanda has made remarkable progress in addressing mental health issues and cultivating a healing culture [1,2]. Following the tragedy of 1994 genocide against the Tutsi in Rwanda, the world watched with horror as the country dealt with the massive trauma inflicted on its people.

The 1994 genocide against the Tutsi left an indelible mark on Rwandans' physical and mental health, claiming over a million lives and leaving countless men, women, and children scarred by the violence and brutality [3].

IMPACT AND RWANDA'S RESILIENCE

The psychological impact of the 1994 genocide against the Tutsi was enormous. Survivors witnessed horrible atrocities, lost loved ones, and dealt with unimaginable emotional trauma. Research from Rwanda's northern area revealed the long-term effects of this trauma, with Mental Health and Psychosocial Support (MHPSS) users still struggling more than two decades after the 1994 genocide against the Tutsi [4]. More studies have shown that the burden of post-traumatic stress disorders (PTSD) and other mental health disorders among Rwandans is still huge [2]. Women had a higher prevalence of mental problems (23.2%) compared to men (16.6%) ($p<0.05$), and the most common mental disorders were severe depressive episodes (12.0%), followed by panic disorder (8.1%), and PTSD (3.6%). Among genocide survivors, women had a higher frequency of mental disorders (53.3%) than men (48.8%), mostly major depressive episodes (35.0%), PTSD (27.9%), and panic disorder (26.8%) [5]. Despite the severe scars left by the 1994 genocide against the Tutsi, Rwanda has made considerable progress in treating mental health concerns and promoting healing and reconciliation in its communities.

Intriguingly, studies done by researchers from the University of Rwanda's Center for Human Genetics and international collaborators have demonstrated scientific evidence of intergenerational transmission of PTSD and epigenetic defects among trauma survivors and their offspring [6–8]. These epigenome-wide association studies identified several differentially methylated regions (DMRs) as well as several potential biomarkers in genocide survivors with potential impact on brain function and likely to be transmitted over generations. These discoveries are relevant to drug targets and present hope for developing precision medicine for preventing trauma and PTSD effects.

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Beside the trauma consequences it is worth noting that Rwanda remains a testimony to its population's incredible resilience in the face of inconceivable hardship [3]. Rwanda has made considerable progress in treating mental health disorders through different programs, including a comprehensive campaign to support and care for survivors. One of the cornerstones of Rwanda's mental health response has been the integration of mental health services into primary care settings [9,10]. Rwanda has been able to serve a greater percentage of the population by decentralizing mental health care and educating community health workers to identify and help people in need, particularly in rural areas where access to specialized services is limited. This method has been praised by experts as an example for other countries facing similar issues [5]. Rwanda has been able to expand mental health services to the community by providing CHWs with mental health training, overcoming challenges such as stigma and a lack of understanding. This technique, which involves the use of electronic health technology for training, has been shown to be viable and effective in increasing mental health awareness and support on a large scale [5,10,11].

Traditional healing techniques have also played an important role. Gacaca courts, where community members took part in offering justice and the reconciliation process, provided a unique way to healing and social cohesion [12]. Gacaca courts, a traditional community-based justice system, greatly contributed to addressing crimes of genocide, trying millions of genocide perpetrators and giving justice to survivors but also enhanced speedy reconciliation among Rwandans. Furthermore, Rwanda has prioritized efforts to reduce the stigma associated with mental illness and foster open discourse about mental health issues. Rwanda has tried to dispel myths and cultural taboos around mental illness through public awareness campaigns and community-based efforts, encouraging people to seek assistance and support when they need it [13]. Moreover, a hybrid intervention, such as community-based sociotherapy, was adopted, integrating psychological trauma healing with rebuilding community trust and resilience [13]. This transformation in attitudes has helped to break down obstacles to care and create a more supportive atmosphere for people suffering from mental illnesses.

Rwanda's approach to mental health care and resilience-building following the 1994 genocide against the Tutsi has gained scholarly appreciation. Survivors who were traumatized during the 1994 genocide against the Tutsi improved significantly in their mental health outcomes after participating in community-based sociotherapy programs [14,15]. These programs, which include supportive-expressive group therapy and psychological support, were found to be beneficial in helping participants reduce their symptoms of depression, anxiety, and PTSD [16]. Furthermore, studies undertaken by the University of Rwanda's Center for Mental Health demonstrated the significance of community resilience in improving mental well-being in post-genocide Rwanda. Robust social support networks and a sense of belonging within communities were critical in mitigating the effects of trauma and developing resilience in survivors [4].

While Rwanda has made tremendous progress in treating mental health issues following the 1994 genocide against the Tutsi, challenges still exist. Access to mental health services is uneven, particularly in remote locations, and there is a need for ongoing investment in mental health infrastructure and worker training [17]. In addition, stigma around mental health disorders remains a barrier [18]. Persistent challenges underline the need for continued efforts to promote access to mental health care, reconciliation, and healing throughout Rwandan society to resolve the underlying trauma and establish a more resilient nation.

Despite these hurdles, Rwanda's growth is unquestionable. Rwanda has emerged as a beacon of hope by putting mental health first and cultivating a resilient culture. Rwanda’s tale exemplifies how communities can heal, rebuild, and move forward in the face of terrible suffering.

CONCLUSION

Today, Rwanda commemorates the 30th anniversary of the 1994 genocide against the Tutsi, serving as an inspiration for the rest of the world. Rwanda's continuous commitment to mental health care and resilience-building interventions has proven the power of resilience in overcoming even the darkest chapters of history. As we reflect on Rwanda's path, let us take heart from the success stories and renew collective commitment to promoting the

mental health and support of all individuals and communities touched by trauma and suffering from the 1994 genocide against the Tutsi.

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Prevalence and correlates of depression and anxiety among university of Rwanda community during COVID-19 pandemic in 2020

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ABSTRACT

INTRODUCTION: The COVID-19 pandemic disrupted many aspects of people's well-being worldwide, including the mental and physical health of university students and staff. The aim of this study was to assess the prevalence and correlates of depression and anxiety during COVID-19 pandemic in students and staff of the University of Rwanda (UR).
METHODS: Utilizing an online Google form, this rapid screening cross-sectional study collected and analyzed primary data from 693 participants (students: 73.9% and staff: 26.1%). Data was collected using a sociodemographic characteristic questionnaire and the Hopkins Symptom Checklist-25 (HSCL-25) for anxiety and depression. Multiple logistic regression model was used to test the association between social demographic characteristics, historical background and outcome variables.
RESULTS: This study found that about 40.6% of students had anxiety symptoms while 38.5% exhibited depression symptoms. Among staff, 34.8 % reported anxiety and 29.3% reported depression. Associated factors of anxiety included experiencing quarantine, pre-existing mental health conditions, exposure to violence, and belonging to a low-income household. Depression was linked to pre-existing mental health issues, COVID-19 related quarantine, and experiences of violence. Notably, students were more prone presenting with symptoms of depression as opposed to staff.
CONCLUSION: The study revealed a high prevalence of anxiety and depression among both students and staff. These findings emphasize the need for mental health services to be made available on campus to support those in the university community who are in need of assistance.

INTRODUCTION

On 11 March 2020, the World Health Organization (WHO) declared the outbreak of a new coronavirus disease, COVID-19, to be a Public Health Emergency of International Concern [1].

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This meant that around the world, countries have woken up to the global health challenge that is COVID-19. None would have imagined that in this time of the year lock down and physical distancing would be the ultimate vaccine across the globe. This outbreak has profoundly affected our way of living and our dreams of life. Globally, the pandemic has spread rapidly leading to increased cases of infected people and deaths. For example, the data reported on March 27th, 2020, revealed that cases of contamination and death have passed 510,528 and 23,028 respectively; with 122, 232 recovered [2].

The COVID-19 pandemic has spread quickly in the majority of the world's nations and has had unexpected effects on health, the economy, society, education, and psychology [3-6]. People frequently experience fear and stress related to a health crisis, which can lead to depression, stress, and anxiety [7-9]; the evidence shows that the Chinese experienced a high level of psychological distress in the times of COVID-19 [1]. Most of the studies carried out in different countries found high psychological difficulties among participants during the COVID-19 crisis [10,11]. The COVID-19 pandemic also had a significant psychological impact on students, as demonstrated by Gazmararian et al., who also documented high rates of anxiety, depression, and stress among students [12]. Additionally, the study conducted by Shepherd et al showed that a majority of students confirmed that the COVID-19 limitations (quarantine and lockdown) had negatively impacted their mental health and thus expressed anxiety, panic, and depression [13].

In Rwanda, numbers were also increasing, and the country had, as of April 9th, 2020, registered 113 confirmed COVID-19 cases and 7 recovered cases [14]. For preventing the rapid spread of the coronavirus, the World Health Organization and countries' governments have taken serious measures which included washing hands regularly for 20 seconds, covering nose and mouth when you cough or sneezing, avoiding close contact, staying home and self-isolation. For example, in China, several measures like discouraging mass gatherings, cancelling or postponing large public events, the closing of schools and universities etc. were strictly enforced by the Chinese authorities as part of the social distancing mandate. Those policies have led to Chinese citizens changing their daily routines and adopting safety behaviors to protect themselves against the spread and contamination of COVID-19 i.e. by avoiding social contact and wearing protective masks [15]. Staying home and social distancing as preventive measures have demonstrated significant impact and success in preventing the COVID-19 spread and contamination[16,17]. However, it is assumed that such a health crisis which has confinement as a preventive measure might be stressful and depressing thus resulting in unhealthy coping strategies which could negatively affect the physical and mental health outcomes associated with the pandemic [16,17]. At all ages, anxiety and fear about COVID-19 can be overwhelming and cause poor outcome for both mental and physical health. Following the 2009 – 2010 H1N1 influenza pandemic, scholars have identified emotional and behavioral needs that were associated with the disease, and which in turn constituted risk factors for poor physical health improvement and recovery [4]. The existing literature has documented several risk factors that affect the development and reaction to health crises like COVID-19 such as attitudes and perception towards the pandemic or disease. At the same time, pre-existing physical and mental conditions were also considered as predicting factors of poor mental health outcomes from the direct and indirect exposure to the pandemic[18]. To this we can deduce that pre-existing anxiety and depression related disorders can be triggers and vulnerability factors for more mental disorders as a result of the COVID-19 outbreak.

In Rwanda, a recent mental health survey conducted in 2018 prior to the pandemic has yielded highest prevalence rates of mental disorders both in the general population and in the sub-sample of survivors of the 1994 genocide against the Tutsi [19].Overall, the prevalence of one or more mental disorders among the general population was 20·49% (N=19,110) and 52·2% (N=1271) in the sample of survivors of the 1994 survivors of the genocide committed against Tutsi in Rwanda. Within the general population, the most prevalent mental disorders were major depressive episode (12·0%), panic disorder (8·1%) and post-traumatic stress disorder (PTSD) (3·6%), while in survivors, major depressive episode was the most prevalent mental disorder (35·0%) followed by PTSD and panic disorders (27·9% and 26·8%, respectively)

[19]. It is therefore considered that the pre-existing poor mental health within the Rwandan population can exacerbate the management of COVID-19 and lead to more mental health difficulties. In other words, the pre-existing mental precocities can worsen the situation and lead to more internalized (anxiety, depression) and externalized (e.g. addictions, sleep difficulties, social isolation, etc.) problems.

Like other Rwandans, the University of Rwanda community (staff and students) was greatly affected by COVID-19 and thus mandates such as social distancing was observed as a preventive measure of its spread. Even though social distancing and isolation mitigate the spread of COVID-19, this coping strategy limits social interaction and social sharing of emotions. In turn, reduced social support and social emotions expression constitute important risk factors to anxiety and depression related difficulties [20]. As such, students and staff were confined at home with limited social contact, which predisposes various mental health and psychosocial needs. The aim of this study was to assess the prevalence and correlates of depression and anxiety during COVID-19 pandemic in students and staff of the University of Rwanda (UR).

METHODS

Study design: This study employed a rapid screening and cross-sectional design conducted entirely online (via Google Form) in 2020. An electronic questionnaire was developed for the purpose of this study which included questions concerning socio-demographic information (age, sex, level of education, marital status, family size, occupation, etc), and chronic health conditions (mental and physical conditions), and experience about COVID-19 Additionally, participants were assessed on the following outcomes: anxiety and depression (Hopkins' Symptoms Checklist-25). Given that the participants were from the university community (both staff and students), the questionnaire was an English version.

Outcome variables: In this current study, the outcome variables were depression and anxiety. The Hopkins Symptom Check List-25 (HSCL-25) is a 25 items instrument used to measure common psychiatric symptoms of depression and anxiety in both clinical and non-clinical samples. The first 10 items assess anxiety symptoms while the remaining 15 items test for depression [21]. An average score of 1.75 indicates a significant level of distress and this was the cutoff point used in our analyses. Our sample showed a very good internal consistency for anxiety (α=0.907) and depression (α=0.911) subscales.

Covariates: Socio-demographic variables in this current study included gender (female and male), marital status (single, married, in relation, separated and cohabiting), number of children (none, 1 to 3, and more than 3), level of education (year 1-5, bachelor, master, and PhD), occupation (undergraduate students, postgraduate students, academic and administrative staff), college (Arts and Social Sciences, Agriculture and Veterinary Medicine, Business and Economics, Education, Medicine and Health Sciences, and Science and Technology); Ubudehe category (none, category 1, category 2, category 3, and category 4); religion (none, Christianity, and Muslim); age (18-24, 25-35, 36-45, 46-49, and above 50); had an existing physical health condition (yes and no), and had an existing mental health condition prior to COVID-19 Pandemic (yes and no), faced a quarantine as a result of COVID-19 (yes and no), experienced any type of the violence during lock-down/quarantine (yes and no), and have been quarantined (yes and no).

The study was submitted for review and approval to the Institutional Review Board, UR-College of Medicine and Health Sciences. All ethical principles to include informed consent, non-maleficence and minimal harm, as well as confidentiality were strictly complied with. The data collected was recorded and uploaded with a security code to limit accessibility. All investigators passed the certificate of training courses for protecting human research participants.

Data analysis: During the data analytical process, data was analyzed descriptively using frequencies, percentages and mean to describe the characteristics of participants (students and staff members). Chi-square test was applied to test if there is an association between depression, anxiety and study variables. Furthermore, a multivariate logistic regression model was used to assess whether participants' social demographic characteristics and existing health issues influence their likelihood of experiencing depression and anxiety. All analyses were conducted using Statistical Package for The Social Sciences (SPSS version 25).

Table 1: *Participants characteristics*

Study variables	Frequency	Percent
Status		
Student	512	73.9
Staff	181	26.1
Gender		
Female	212	30.6
Male	481	69.4
Marital Status		
Single	491	70.9
Married	196	28.3
Separated	4	0.6
Cohabiting	2	0.3
Level of education		
Advanced diploma	8	1.2
BSc	65	9.4
MSc	144	20.8
PhD	32	4.6
Undergraduate	444	64.1
Occupation		
Undergraduate Student	478	69.0
UR-Post-graduate Student	34	4.9
UR- Academic Staff	156	22.5
UR-Administrative Staff	25	3.6
College Affiliation		
Colleges of Arts and Social Sciences	41	5.9
Colleges of Agriculture and Veterinary Medicine	46	6.6
College of Business and Economics	31	4.5
College of Education	23	3.3
College of Medicine and Health Sciences	477	68.8
College of Science and Technology	75	10.8
Ubudehe Category		
None	46	6.6
Category 1	54	7.8
Category 2	160	23.1
Category 3	427	61.6
Category 4	6	0.9
Religion		
None	18	2.6
Christianity	661	95.4
Muslim	14	2.0
Had an existing physical health condition		
No	661	95.4
Yes	32	4.6
Had an existing mental health condition prior to COVID-19 Pandemic		
No	608	87.7
Yes	85	12.3
Faced a quarantine as a result of COVID-19		
No	432	62.3
Yes	261	37.7
Had been infected with Corona Virus and isolated as a result		
No	648	93.5
Yes	45	6.5
Experienced any violence		
No	608	87.7
Yes	85	12.3

RESULTS

Table 1 provides the descriptive statistics of our sample. Within the sample, 73.9 percent were students, while 26.1 percent were staff members. The majority of our sample were male (69.4 percent). Regarding the marital status, a vast majority of the respondents were unmarried, making up 70.9 percent; followed by married participants (28.3%). The highest proportion of participants were undergraduate and masters' students (64.1% and 20.8%, respectively). Besides this, most of the participants were affiliated to the college of medicine and health sciences (68%). With respect to participants' ubudehe categories, the results show that the majority were in the third and second categories (61.6 % and 23.1 %, respectively). In light of health conditions, 4.6% and 12.3% reported that they had existing physical and mental health conditions, respectively. Additionally, 37.7% confirmed that they faced a quarantine as a result of COVID-19, while 6.5%

Table 2: *Prevalence of depression and anxiety among students*

Study variables		Had depression symptoms				Had anxiety symptoms			
		No		Yes		No		Yes	
		Freq	%	Freq	%	Freq	%	Freq	%
Status	***p*-value**		**0.027**				**0.168**		
Student		315	61.5	197	38.5	304	59.4	208	40.6
Staff		128	70.7	53	29.3	118	65.2	63	34.8
Gender	***p*-value**		**0.343**				**0.853**		
Female		130	61.3	82	38.7	128	60.4	84	39.6
Male		313	65.1	168	34.9	294	61.1	187	38.9
Marital status	***p*-value**		**0.431**				**0.399**		
Single		305	62.1	186	37.9	295	60.1	196	39.9
Married		134	68.4	62	31.6	122	62.2	74	37.8
Separated		3	75.0	1	25.0	4	100.0	0	0.0
Cohabiting		1	50.0	1	50.0	1	50.0	1	50.0
Level of education	***p*-value**		**0.367**				**0.438**		
Advanced diploma		5	62.5	3	37.5	5	62.5	3	37.5
BSc		40	61.5	25	38.5	42	64.6	23	35.4
MSc		97	67.4	47	32.6	89	61.8	55	38.2
PhD		25	78.1	7	21.9	24	75.0	8	25.0
Undergraduate		276	62.2	168	37.8	262	59.0	182	41.0
Occupation	***p*-value**		**0.177**				**0.509**		
Undergraduate Student		294	61.5	184	38.5	283	59.2	195	40.8
UR-Post-graduate Student		21	61.8	13	38.2	21	61.8	13	38.2
UR- Academic Staff		110	70.5	46	29.5	103	66.0	53	34.0
UR-Administrative Staff		18	72.0	7	28.0	15	60.0	10	40.0
College Affiliation	***p*-value**		**0.363**				**0.645**		
Colleges of Arts and Social Sciences		24	58.5	17	41.5	26	63.4	15	36.6
Colleges of Agriculture and Veterinary Medicine		32	69.6	14	30.4	29	63.0	17	37.0
College of Business and Economics		20	64.5	11	35.5	18	58.1	13	41.9
College of Education		16	69.6	7	30.4	13	56.5	10	43.5
College of Medicine and Health Sciences		311	65.2	166	34.8	297	62.3	180	37.7
College of Science and Technology		40	53.3	35	46.7	39	52.0	36	48.0
Ubudehe Category	***p*-value**		**0.935**				**0.065**		
None		32	69.6	14	30.4	31	67.4	15	32.6
Category 1		35	64.8	19	35.2	24	44.4	30	55.6
Category 2		100	62.5	60	37.5	95	59.4	65	40.6
Category 3		272	63.7	155	36.3	267	62.5	160	37.5
Category 4		4	66.7	2	33.3	5	83.3	1	16.7

Continued on the next page....

Table 2. Continued

Religion	***p*-value**		**0.460**				**0.586**	
None		9	50.0	9	50.0	13	72.2	5	27.8
Christianity		425	64.3	236	35.7	401	60.7	260	39.3
Muslim		9	64.3	5	35.7	8	57.1	6	42.9
Had an existing physical health condition	***p*-value**		**0.193**				**0.581**	
No		426	64.4	235	35.6	404	61.1	257	38.9
Yes		17	53.1	15	46.9	18	56.3	14	43.8
Had an existing mental health condition prior to COVID-19 Pandemic	***p*-value**		**<0.001**				**<0.001**	
No		420	69.1	188	30.9	393	64.6	215	35.4
Yes		23	27.1	62	72.9	29	34.1	56	65.9
Faced a quarantine as a result of COVID-19	***p*-value**		**0.024**				**0.001**	
No		290	67.1	142	32.9	283	65.5	149	34.5
Yes		153	58.6	108	41.4	139	53.3	122	46.7
Had been infected with Corona Virus and isolated as a result	***p*-value**		**0.571**				**0.088**	
No		416	64.2	232	35.8	400	61.7	248	38.3
Yes		27	60.0	18	40.0	22	48.9	23	51.1
Experienced violence	***p*-value**		**<0.001**				**<0.001**	
No		413	67.9	195	32.1	392	64.5	216	35.5
Yes		30	35.3	55	64.7	30	35.3	55	64.7

Freq: Frequency; %: Percentage

have been infected with Corona Virus and isolated as a result, and a further 12.3% experienced any type of violence. The mean age was 28.61years (SD=9.36).

Table 2 shows that the prevalence of depression among students (38.5%), was significantly higher compared to staff members (29.3%). On the other hand, the prevalence of anxiety was almost equal between both students and staff members (39.6% and 38.9%, respectively). Participants who had existing mental health conditions prior to the COVID-19 pandemic had a higher prevalence of depression and anxiety than participants who had no existing mental health conditions. A significantly higher prevalence of depression and anxiety was noted among participants who had experienced any type of violence compared to those who did not experience violence during COVID-19. Findings also indicated that depression and anxiety was more prevalent among participants who faced a quarantine because of COVID-19 than those who did not face it. Tables 3 and 4 shows the results of multiple logistic regression model. Students had significant higher odds for having depression symptoms compared to UR staff members (OR=1.51, 95%CI=1.05-2.18). Participants who had existing mental health conditions prior to COVID-19 pandemic also had significantly higher odds of depression symptoms than those who had no pre-existing mental health conditions (OR=4.91, 95%CI=2.90-8.31). On the other hand, participants who had experienced any type of violence were associated with increased risks of having depression symptoms (OR=2.95, 95%CI=1.76-4.88). Additionally, the participants who faced a quarantine because of COVID-19 were more likely to have depression symptoms than those who did not face the quarantine (OR=1.47, 95%CI=1.04-2.06).

Table 4 above provides information related to associated factors of anxiety symptoms. The results show that participants from category 1 were

Table 3: *Factors associated with depression symptoms*

			95% C.I	
	***p*-value**	**aOR**	**Lower**	**Upper**
Occupation				
Undergraduate Student	0.523	1.360	0.530	3.490
UR-Post-graduate Student	0.538	1.444	0.448	4.655
UR- Academic Staff	0.871	1.085	0.404	2.910
UR-Administrative Staff (ref)				
Had an existing physical health condition				
No(ref)				
Yes	0.154	1.752	0.811	3.786
Had an existing mental health condition prior to COVID-19 Pandemic				
No (ref)				
Yes	<0.001	4.911	2.904	8.307
Faced a quarantine as a result of COVID-19				
No (ref)				
Yes	0.028	1.466	1.042	2.062
Experienced any type of violence				
No (ref)				
Yes	<0.001	2.935	1.764	4.882
Status				
Student	0.027	1.510	1.047	2.179
Staff (ref)				

C.I.: Confidence interval; aOR: Adjusted odds ratio, ref: reference category

associated with increased risks of having anxiety symptoms (OR=9.08, 95%CI=1.80-16.42). Those who had an existing mental health condition prior to COVID-19 were associated with higher odds of having anxiety symptoms (OR=3.16, 95%CI=1.90-6.26) than those who did not. There was an association between facing a quarantine and having higher odds of anxiety symptoms (OR=1.67, 95%CI=1.20-2.34). Furthermore, experiencing any type of violence was associated with higher odds of anxiety symptoms than having not experienced any type violence (OR=2.83, 95%CI=1.71-4.68).

DISCUSSION

To the best of our knowledge, this is the first study to examine the prevalence and correlates of anxiety and depression among the University of Rwanda community (staff and students) during the pandemic of COVID-19. Overall, the study has found that prevalence of depression among students (38.5%), was significantly higher compared to staff members (29.3%). On the other hand, the prevalence of anxiety was almost equal between both students and staff members (39.6% and 38.9%, respectively). These results were confirmed by other studies conducted in Bangladesh where 82% of the university community suffered from moderate to severe depression and anxiety [22].

In another study conducted in China, the symptoms of depression and anxiety were also found in students during lockdown periods, 1 year after the onset of the pandemic [23,24]; Similarly, in Malaysia, a significant prevalence of anxiety in students was observed during the first year of the pandemic [25]. However, the case of Sweden was different [26]. The DASS21 survey was launched in Swedish students during the first 3 months of the pandemic and no significant increase in stress,

Table 3: *Factors associated with anxiety symptoms*

			95% C.I	
Study variables	***p*-value**	**aOR**	**Lower**	**Upper**
Ubudehe category				
None	0.347	3.186	0.284	35.695
Category 1 (very poor)	0.049	9.075	0.804	102.429
Category 2 (poor)	0.206	4.644	0.429	50.248
Category 3 (middle)	0.263	3.817	0.365	39.923
Category 4(upper) (ref)				
Had an existing mental health condition prior to COVID-19 Pandemic				
No (ref)				
Yes	<0.001	3.156	1.895	6.256
Status				
Students	0.461	0.857	0.569	1.291
Staff (ref)				
Faced a quarantine because of COVID-19				
No				
Yes	0.002	1.674	1.199	2.338
Suspected of having been infected with Corona Virus and isolated as a result				
No (ref)				
Yes	0.244	1.454	0.775	2.728
Experienced any type of violence				
No (ref)				
Yes	<0.001	2.829	1.710	4.681

C.I.: Confidence interval; aOR: Adjusted odds ratio, ref: reference category

anxiety, and depression levels was revealed. On the contrary, Swedish students' mental state was improved, especially during the summer months of the first year of the pandemic [26].The exact reason for the difference is not firm, but there is a possibility that the students were well informed which resulted in proactive behaviors for taking care of their mental well-being [25].

Concerning the issues of staff and students, there's no specified reason for why students suffered more than staff, but we can consider staff as mature and being more informed about what to do which can lessen their depression and anxiety. Furthermore, being married and having children may have served as a protective factor from mental illness for the staff members.

On the other hand, participants who experienced any type of violence (e.g., domestic violence, sexual violence, intimate partner violence, emotional abuse) were associated with increased risks of having depression symptoms. Additionally, the participants who faced a quarantine because of COVID-19 were more likely to have depression symptoms than those who did not face the quarantine. These results were supported by other studies which indicated that students who witnessed domestic violence in the family are more likely to suffer from depression and anxiety compared to those who did not [27,28].

Our results also show that, participants from category 1(from very poor family) were associated with increased risks of having anxiety symptoms. This was supported by a study conducted in the United States of America which revealed that students with low quality of life and health, low income, and of young age were at risk of

psychological distress due to the pandemic [29].
We also observed that students who perceived their families' economic condition as poor are more depressed, anxious, and co-morbid compared to those who think that they are financially well-off, and the results are statistically significant. Students judge their economic well-being in terms of how well-off their friends and other classmates are. In this era of social media, people are constantly engaging in comparison of their own purchasing capacity against others [30]. In the case of the students in our sample, such perception seemed to be more important compared to quantifiable levels of income.
Furthermore, participants who had existing mental health conditions prior to the COVID-19 pandemic had higher prevalence of depression and anxiety than participants who had no pre-existing mental health conditions. Those who had an existing mental health condition prior to COVID-19 were associated with higher odds of having anxiety symptoms than those who did not have the symptoms. This was supported by theoretical framework on the previous studies which described anxiety disorders as recurrent especially during a stressful period [31], Contrary to the other studies, the respondents in a study conducted by Falade et al. with previous history of mental illness were less likely to have anxiety disorders. This was because COVID-19 pandemic has generated fear amongst the general population [32] , therefore, respondents with no history of mental illness may have been experiencing this level of anxiety for the first time compared to respondents who had previous history of mental illness and might have experienced a stressful event for which they had already been attending regular mental health clinics. Our findings also showed that, participants with pre-pandemic mental health conditions had higher odds of depression than those with no pre-pandemic mental health conditions. Nevertheless, our findings are supported by previous studies that found having pre-existing mental health diagnosis was associated with increased depression scores [33-36].

CONCLUSION

The findings of the present study indicate that the prevalence of depression and anxiety was high among the University of Rwanda community during COVID-19 pandemic. This study also highlighted a significant association between facing quarantine during COVID-19, having existing mental health conditions prior to the pandemic, experiencing any type of violence, and being in poor category of Ubudehe and mental disorders (depression and anxiety). Finaly, the findings call for mental health services provision, availability and accessibility to respond to the mental health and psychosocial support needs expressed by the participants to this study. Governments should allocate resources and work with experts to establish mental health support programs. Community organizations play a vital role in mobilizing resources and advocating for prioritizing mental health. Student clubs must be empowered to advocate for services, engage in self-care, and foster supportive environments. Universities must establish mental health support facilities for students. Digitalization of mental health support and mental health resources is important and plays a vital role in special cases like the COVID-19 pandemic

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Original Research

Open Access

Evaluating the prevalence of early weaning of children and its determinants among maternal attendees at Remera Health Center, Kigali, Rwanda, 2023: a cross-sectional study

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ABSTRACT

INTRODUCTION: While breast milk is vital in fostering infant growth and diminishing the risk of illnesses, global exclusive breastfeeding rates stand at 45.7%. Early weaning remains a persistent issue, particularly in low- and middle-income countries. Consequently, this study was formulated to evaluate the prevalence of early weaning and its influencing factors among mothers seeking care at the Remera Medicalized Health Center.

METHOD: A cross-sectional investigation encompassed 370 randomly chosen breastfeeding mothers who underwent data collection via a structured questionnaire.

RESULTS: In the cohort of 370 participants, this study unveiled that 97.8% (n=362) concurred on the importance of exclusive breastfeeding, yet only 73.8% (n=263) adhered to this practice. Notably, 26% (n=97) initiated early weaning. Breastfeeding challenges were reported by 51.6% (n=191) of participants, with 21.6% (n=80) facing issues of low milk supply and 8.1% (n=30) experiencing child refusal to breastfeed. Furthermore, 90.8% (n=336) demonstrated awareness of the consequences of early weaning, and 33.5% (n=124) acknowledged agreement with all the potential repercussions. Among mothers who practiced early weaning, 29.9% (n=29) did so at 4 months, 25.9% (n=25) at 5 months, 21.6% (n=21) at 3 months, and 11.3% (n=11) at 1 and 2 months. Reasons for early weaning included tight schedules (43.3%, n=42) and the baby's hunger (36.1%, n=35). Additionally, 77.6% (n=287) concurred that the choice of early weaning should ultimately be the mother's decision.

CONCLUSION: The primary factors influencing mothers' adoption of early weaning were predominantly their demanding schedules, which encompassed both work and studies, as well as the baby's heightened need for food owing to hunger

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INTRODUCTION

The World Health Organization (WHO) states that weaning as complementary feeding, beginning when breast milk alone is insufficient to meet newborns' nutritional needs and additional foods and liquids are needed in addition to breast milk [1]. However, Early weaning is the interruption of breastfeeding in the first six months of life [2]. Breastfeeding is the act of feeding a baby with a

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mother's breast milk. The practice of only giving breast milk to an infant for the first six months of life without any other food or liquid other than medication is known as Exclusive breastfeeding [3]. Breastmilk is the ideal food for infants. For a baby to grow and develop to its full potential, the baby needs the right foods at the right time. The crucial time for good nutrition of a baby is between the inception of pregnancy of a woman and the second birthday of a child, which is usually referred to as the 'critical window' and which is approximately 1000 days. The best food for a child's growth and development during this critical window is breast milk. Breast milk provides all the vitamins, minerals, enzymes, and antibodies needed by a child to grow and thrive [3]. Breast feeding can be beneficial to the mother, as it helps prevent postpartum hemorrhage, reduces the risk of breast and ovarian cancers, and allows for better spacing of pregnancies among women [3].

In the low-income/middle-income countries, only 39% of children aged less than 6 months are exclusively breastfed, and just about 58% of children 20–23 months old benefit from the practice of continued breastfeeding, which highlights the poor overall breastfeeding practices in the world. Initiation of breastfeeding within the first hour of birth may lead to the prevention of about 20% of neonatal deaths. In low-income/middle-income countries, optimal breastfeeding has the potential of preventing 12% of all under-5 deaths [3].

WHO advises mothers to practice exclusively breastfeeding (EBF) for six months and continue to breastfeed along with complementary foods for two years or longer [4]. In many places around the world, women breastfeed their children for over two years. However, contrary to WHO recommendations, fewer than half of infants under 6 months old are exclusively breastfed [3].

Globally, 45.7% of infants are exclusively breastfed before six months, 32.0% are exclusively breastfed at 4-5 months [5]. In Kigali, the prevalence of EBF for the entire first six months was 55.7%. EBF reduces progressively from birth, where it is 85.1%, 81.9%, and 57.5% at 1 month, 3 months, and 5 months respectively. Breastfeeding is initiated within the first hour of life at a rate of 80.5%, and breast milk is the predominant type of feeding given to the baby first after delivery at 89.6% (198/221). Other types of first feeds include formula milk (8.1%), sugary water (1.4%) and juice (0.9%). Early initiation (before six months) of complementary feeding was found to begin as early as age one month at a rate of 7.7% (17/221) while 24.4% (54/221) of mothers start supplementing between four and five months [6]. Some people choose to wean early, and others have to stop breastfeeding before they want to due to a variety of issues like pain, concern over a low milk supply, lack of support, fatigue, return to work or school, breastfeeding difficulty, maternal medical issue, embarrassment and the desire to have another child [7].

Factors frequently associated with early weaning include first pregnancy, low birth weight, pacifier use, maternal difficulty to breastfeed after childbirth, late onset of breastfeeding, lack of EBF awareness in maternity, maternal misunderstanding related to ideal breastfeeding timing under six months, lack of breastfeeding advantages awareness, lack of breastfeeding paternal support, working mothers, tobacco, and alcohol use, maternal young age, and maternal education [2].

Consequently, due to the fact that infants' kidneys and digestive systems are still developing. Asthma, eczema, digestive issues, allergies, and obesity may all become more common in later life if solids are introduced too soon [8]. In addition, for infants, never breastfeeding or early weaning is associated with increased risks of otitis media, diarrhea, lower respiratory tract infection, sudden infant death syndrome, leukemia, and type 1 diabetes [9]. The choice not to breastfeed can moreover unfavorably influence mothers' wellbeing by expanding the hazard of pre-menopausal breast cancer, ovarian cancer, type II diabetes, hypertension, hyperlipidemia and cardiovascular diseases [10]. Despite numerous past studies on breastfeeding practices in Rwanda, none have explicitly delved into examining or assessing the prevalence of early weaning and its associated contributing factors among mothers at Remera Health Center. Consequently, this research aims to fill the existing gap in the literature within the specified area of study, providing valuable data and contributing to the enhancement of weaning practices.

METHODS

Study Design and Sampling Technique: The study was conducted at the Remera Medicalized

Health Center, situated in Gasabo district, Remera sector, Rukiri II, Amahoro Village. Established in 1994, this health center currently caters to a population of 100,000 from three cells of the Kimironko sector, four cells of the Remera sector, and neighboring areas. Utilizing a quantitative, cross-sectional study design, the research focused on mothers with infants below two years of age who availed various services, particularly in vaccination, family planning, and the outpatient department at Remera Medicalized Health Center. The total population for this study was derived as N=2500 based on health center records.

The sample size calculation followed the formula by Bolarinwa (2020), suitable for numerical outcomes, taking into consideration the assumed variance (σ) of 0.5 due to limited local studies on weaning practices. The standard normal deviation at a 95% confidence interval (Z=1.96) and precision level (d=0.05) were used. The initial sample size was calculated as 384, considering an infinite population correction, resulting in an adjusted sample size of 332.87. To account for a 10% non-response rate, the final sample size was adjusted to 370.The sample size calculation formula (Bolarinwa, 2020) [11] appropriate for a numerical outcome (means and variance) of the population of the study is obtained thus:

Where $n=(Z^2\ \sigma^2\ )/d^2$
Z = standard normal deviate at 95% CI assumed at 1.96
σ = is the variance assumed at 0.5 (because of scarce local study on the weaning among mothers)
d =precision level set at 0.05 (5%)
$n= [(1.96)^2 \times (0.5)^2]/(0.05)^2$
=0.9604/0.0025 = 384

To adjust for an infinite population, which means that the total number of weaning mothers at Remera is <10,000, Adjusted n = n/(1+(n/N)) was applied (Bolarinwa, 2020)
Where N = estimated total number mothers with babies less than two years old at Remera Medicalized Health Center = 2500 as reported by the health center.
Therefore, adjusted n = 384/(1+(384/2500)) = 332.87
Lastly, to adjust for the non-response of 10% (P) = n/(1-P)
Final sample size = Sample size = 332.87/((1-0.1)) = 370

Eligibility criteria
This research targeted mothers exclusively attending Remera Medicalized Health Center, accompanied by children below the age of two, who were present during the data collection period and willingly agreed to participate.
Individuals deemed too frail to engage, clients in a rush, and those unable to provide informed consent due to cognitive impairments were excluded from participation in the study.

Study Tool
The study employed a random sampling technique to select 370 mothers who met the inclusion criteria, primarily utilizing the Vaccination, Out-patient, and Family Planning departments to identify the targeted population.
For data collection, a questionnaire consisting of 18 closed-ended questions was developed and administered to each participant. To ensure inclusivity, the questionnaire was translated into the local language (Kinyarwanda). Participants who faced challenges in reading were provided assistance in understanding the questionnaire. Prior to its use in the actual research, the questionnaire underwent a pre-test, during which any necessary corrections were made.

Data analyisis
Descriptive analysis was carried out using the Statistical Package for the Social Sciences (SPSS) version 21 to summarize demographic attributes, breastfeeding practices, and weaning practices. This involved the use of descriptive statistics, bivariate analysis, and logistic regression statistics as part of the methodology.

After the presentation and approval of the research proposal, the College of Medicine and Health Sciences (CHMS)-School of Health Sciences Institutional Review Board (IRB) issued an ethical clearance CMCH/IRB/432/2023.
Subsequently, Permission for the collection of data was sought from Remera Medicalized Health Center Authority. 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. Participants provided informed consent before their involvement, and we maintained a commitment to using respectful and non-offensive

language throughout the study.

RESULTS

Characteristics of Respondents

Table 1 outlines the characteristics of respondents, including their social demographic information, knowledge about the essentiality of exclusive breastfeeding, as well as sources of information about early weaning. Among the 370 participants, 50.8% (n=188) fell within the age range of 26-35 years, followed by those whose age range is 18-25 years, constituting 32.4% (n=120). Additionally, 15.4% were aged between 36-45 years, and those aged less than 18 accounted for 1.4% (n=5).

In terms of employment status, the majority, 53.8% (n=199), were unemployed, followed by 30.5% (n=113) who were self-employed. 7.8% (n=29) worked for others, 7% (n=26) were employed by the government or non-government

Table 1: *Characteristics of Respondents*

Variable	Number (n)	Percentage
Age (years)		
< 18	5	1.4
18 – 25	120	32.4
26 – 35	188	50.8
36 – 45	57	15.4
Occupation		
Unemployed	199	53.8
Self-employed	113	30.5
Government/NGO worker	26	7
Works for others	29	7.8
Student	3	0.8
Education		
No formal education	6	1.6
Primary (completed)	43	11.6
Secondary (incomplete)	103	27.3
Secondary (completed)	91	24.6
University	127	34.3
Religion		
Catholic	103	27.8
Protestant	187	50.5
Adventist	56	15.1
Jehovah witness	7	1.9
None	17	4.6
Income/Ubudehe Category		
Category 1	21	5.7
Category 2	238	64.5
Category 3	109	29.5
Category 4	1	0.3

Continued on the next page.....

Table 1: Continued....

Marital status		
Single	52	14.1
Married	314	84.9
Divorced	3	0.8
Number of children		
1	125	33.8
2 – 4	224	60.5
≥ 5	21	5.7
Age of youngest child		
< 3 months	149	40.3
4 - 6 months	85	23
7 - 24 months	136	36.8
4 - 6 months	85	23
7 - 24 months	136	36.8
Exclusive breastfeeding is essential (n=370)		
Agree	362	97.8
Disagree	4	1.6
Unsure	4	1.6
Receive information or guidance about early weaning? (n=370)		
Yes	185	50
No	185	50
Sources of early weaning information (n=184)		
Healthcare professional	134	72.8
Family or friends	22	12
Social media	24	13.6
Others	3	1.6
Social media	24	13.6
Others	3	1.6

organizations, and the least were students at 0.8% (n=3). Concerning educational attainment, 51.9% (n=194) had attended secondary school, with 27.3% (n=103) not completing, and 24.6% (n=91) successfully completing secondary education.

University attendees comprised 34.3% (n=127) of the overall participants. Those who only finished primary school were 11.6% (n=43), and the least were those who never attended any formal education at 1.6% (n=6). Marital status indicated that the majority, 84.9% (n=314), were married, 14.1% (n=52) were single, 0.8% (n=3) were divorced, and 0.3% (n=1) were widowed.

Regarding religion, 50.5% (n=187) were Protestants, 27.8% (n=103) were Catholics, 15.1% (n=56) were Adventists, 4.6% (n=17) did not belong to any religion, and 1.9% (n=7) were Jehovah's Witnesses. In terms of Ubudehe category, 64.5% (n=238) were in category 2, 29.5% (n=109) were in category 3, 5.7% (n=21) were in category 1, and 0.3% were in Ubudehe category 4.

Additionally, the majority of participants (60.5%, n=224) had 2 to 4 children, 33.8% (n=125) had only 1 child, and the remaining 5.7% (n=21) had more than 7 children. For instance, 40.3% (n=149) of the participants' youngest children were less than 3 months old, 36.8% (n=136) were in the range of 7-14 months, and 23% (n=85) were in the age

Table 2: *Breastfeeding Challenges*

Variable	Number (n)	Percentage
Challenges or difficulties in breastfeeding		
Sore nipples		
No	370	100
Yes	0	0
Low milk supply		
No	290	78.4
Yes	80	21.6
Child refuse to breastfeed		
No	340	91.9
Yes	30	8.1
Feelings of sadness or depression		
No	347	93.8
Yes	23	6.2
Dealing with judgements		
No	370	100
Yes	0	0
No challenge		
No	191	51.6
Yes	179	48.4

range of 4-6 months. Furthermore, 97.8% (n=362) acknowledged that exclusive breastfeeding is paramount. On the other hand, 1.6% (n=3) never considered exclusive breastfeeding to be significant, with the same percentage of participants who don't know whether it is significant or not. The participants who have and those who have not received any information about early weaning are in the same ratio of 50% (n=185). From those who have obtained information about early weaning, 72.8% (n=135) obtained it from healthcare professionals, 13.6% (n=24) from social media, 12% (n=22) from family or friends, and 1.6% (n=3) from other unspecified sources.

Challenges Encountered During Breastfeeding among the Respondents

Table 2 illustrates the challenges or difficulties encountered by breastfeeding mothers at Remera Health Center. The majority of participants, 51.6% (n=191), had experienced some challenges or difficulties during breastfeeding. For instance, 21.6% (n=80) had encountered issues related to low milk supply, 8.1% (n=30) reported instances where their child refused to breastfeed, and 6.2% (n=23) felt sadness or depression while breastfeeding. On the other hand, none ever reported having sore nipples or dealing with judgments about ceasing breastfeeding.

The Knowledge Regarding Consequences of Early Weaning

Table 3 presents the perceived consequences that mothers associate with practicing early weaning. Out of the 370 participants, 90.8% (n=336) were aware of certain outcomes linked to early weaning. Specifically, 33.5% (n=124) concurred with all the consequences, including increased digestive problems, risks of allergies, lack of breast milk nutrients, risks of obesity, risk of respiratory problems, and choking. On the other hand, some mothers agreed with specific consequences as follows: digestive issues 44.3% (n=165), lack of nutrients from breast milk 30.5% (n=113), increased risk of allergies 28.9% (n=107), choking 25.5% (n=87), risk of obesity 12.7% (n=47), risk of respiratory diseases 11.9% (n=44) and 9.2% did not know any consequence of early weaning.

Table 3: *Knowledge Regarding Consequences of Early Weaning*

Variable	Number (n)	Percentage (%)
Potential risks or challenges associated with early weaning		
Digestive issues		
No	206	55.7
Yes	164	44.3
Increased risk of allergies		
No	263	71.1
Yes	107	28.9
Lack of nutrients from breast milk		
No	257	69.5
Yes	113	30.5
Risk of obesity		
No	323	87.3
Yes	47	12.7
Risk of respiratory diseases		
No	326	88.1
Yes	44	11.9
Chocking		
No	283	76.5
Yes	87	25.5
All correct		
No	246	66.5
Yes	124	33.5
None is correct		
No	17	4.6
Yes	353	95.4
I don’t know		
No	336	90.8
Yes	34	9.2

The Prevalence, Time, Reason, and Weaning Choice

Table 4 and Figure 1 delineate the prevalence, timing, mothers' awareness of the period to commence weaning, and their preferences regarding the choice for weaning. Out of the 370 participants, 26% (n=97) practiced early weaning fig.1, indicating that only 73.8% (n=263) adhered to exclusive breastfeeding. Among mothers who initiated early weaning, the majority (29.9%, n=29) did so at 4 months of age, followed by 25.9% (n=25) at 5 months, 21.6% (n=21) at 3 months, and 11.3% (n=11) at 1 and 2 months. Many attributed tight work or study schedules (43.3%, n=42) and the baby's hunger or increased demand for food (36.1%, n=35) as the primary factors for early weaning. Other factors include the presence of a medical condition (13.4%, n=13), availability of food (8.2%, n=8), perception that the baby was ready for solid foods (3.1%, n=3), and pressure from family or friends (2.1%, n=2). None reported starting food supplementation before six months

Table 4: *Time, Reasons, and Weaning Choice*

Variable	Number (n)	Percentage (%)
Age at introduction of complimentary feeding		
4-<6 months	10	2.7
6 months	326	88.8
≥6 months	31	8.5
Month started weaning before 6 months		
1 month	11	11.3
2 month	11	11.3
3 month	21	21.6
4 month	29	29.9
5 month	25	25.9
Reason for weaning (n=97)		
Pressure from family or friend	2	2.1
Advice from healthcare professionals	0	0
Baby's hunger or increased demand for food	35	36.1
Tight schedule of work or study	42	43.3
Perception that the baby was ready for solid foods	3	3.1
Cultural or traditional beliefs	0	0
Personal experience	0	0
Food availability	8	8.2
Medical condition	13	13.4
Mother's death	0	0
Choice for starting weaning		
Specific guidelines	287	77.6
Individual choice	73	19.7
I don't know	10	2.7

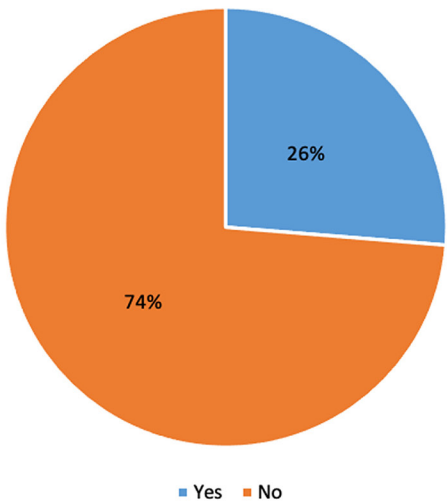

Figure 1: *Prevalence of early weaning; did you introduce any complementary foods or liquids before six months of age? (n=370)*

Table 5: *Bivariate association of socio-Demographic, Maternal and Child Characteristics and early weaning*

	YES		NO		Chi-square	*p*-Value
Variable	**N**	**%**	**N**	**%**		
Age					25.485	<0.001**
< 25 years	19	19.6	105	38.6		
26 - 35	49	50.5	139	51.1		
36 - 44	29	28	28	10.3		
Occupation					14.145	<0.001**
Unemployed	37	38.1	164	60.3		
Employed	60	61.9	108	39.7		
Education					1.875	0.171
Less than secondary	34	35.1	117	43		
Secondary or University	63	64.9	155	57		
Marital status					0.804	0.37
Not married	12	12.4	44	16.2		
Married	85	87.6	228	83.8		
Income/Ubudehe category					5.418	0.020*
1 - 2	59	60.8	199	73.4		
3 - 4	38	39.2	72	26.6		
Religion					0.09	0.764
None	5	5.2	12	4.4		
Christianity	92	94.8	260	95.6		
Number of children					13.027	<0.001**
1	19	19.6	105	38.6		
2 - 4	69	71.1	155	57		
≥ 5	9	9.3	12	4.4		
Age of youngest child					3.809	0.149
< 3 months	32	33	117	43		
4 - 6 months	28	28.9	57	21		
7 - 24 months	37	38.1	98	36		
Age at introduction of complementary foods					15.685	<0.001**
4 - <6 months	80	84.2	245	90.4		
6 months	8	8.4	2	0.7		
> 6 months	7	7.4	24	8.9		
Knowledge of Early weaning consequences					0.343	0.558
Have knowledge	30	30.9	93	34.2		
Do not know	67	69.1	179	65.8		
Choice for early weaning					1.413	0.493
Specific guidelines	71	73.2	215	79		
Individual choice	23	23.7	50	18.4		
I don't know	3	3.1	7	2.6		

**Significant at p≤0.05, **Highly significant at p<0.01*

due to advice from healthcare professionals, cultural or traditional beliefs, personal experience, or the mother's death.

Regarding the weaning choice, 77.6% (n=287) concurred that the decision on when to start weaning a baby should not solely be the mother's choice; rather, specific guidelines should be in place. Only 19.7% (n=73) reported that it should be the mother's choice, and 2.7% (n=10) didn't know whether it might be the mother's choice or if there should be specific guidelines.

Association between Socio-Demographic factors, Maternal and Child Characteristics and Knowledge Related to the Consequences of Early Weaning

Table 5 presents the likelihood of early weaning relative to specific variables. Regarding socio-demographic factors, the findings indicate that age, occupation, number of children, and awareness regarding the appropriate age to commence weaning are significant factors positively associated with the probability of early weaning, all demonstrating statistical significance with a p-value of p<0.001. In contrast, factors such as income/Ubudehe category were only slightly associated with early weaning (p=0.020), while factors found to have no relationship with early weaning include education status (p=0.171), marital status (p=0.37), religion (p=0.764), age of the youngest child (p=0.149), knowledge of early weaning consequences, and the choice for early weaning (p=0.493)

Factors Associated with Early Weaning

According to Table 6, women aged 36-44 are 3.71 times more likely to practice early weaning (AOR=3.71, 95% CI: 1.48-9.28, P=0.005) than those aged 25 or younger. Employed mothers also have a 1.92 times higher likelihood of practicing early weaning (AOR=1.92, 95% CI: 1.14-3.24, p=0.014) compared to those who are unemployed. The number of mothers aware that food should be introduced at six months (AOR=15.08, 95% CI: 2.94-77.34, P=0.001) is 15.08 times higher than those aware that food can be offered earlier. There

Table 6: *Factors Associated with Early Weaning*

Variable	COR (95% CI)	*p*-value	AOR (95% CI)	*p*-value
Age (years)		<0.001**		0.011*
< 25	1		1	
26- 35	1.95 (1.08-3.51)	0.026*	1.38 (0.69-2.75)	0.362
36- 45	5.72 (2.81-1168)	<0.001**	3.71 (1.48-9.28)	0.005*
Occupation				
Unemployed	1		1	
Employed	2.46 (1.53-3.97)	<0.001**	1.92 (1.14-3.24)	0.014*
Income/Ubudehe category				
1- 2	1		1	
3- 4	0.56 (0.35-0.92)	0.021*	1.39 (0.81-2.37)	0.234
Number of children		0.002*		0.597
1	1		1	
2- 4	2.46 (1.40-4.33)	0.002*	1.41 (0.72-2.77)	0.311
≥ 5	4.15 (1.54-11.19)	0.005*	1.46 (0.42-5.01)	0.55
Age at introduction of complementary foods		0.007*		0.005*
4- <6 months	1		1	
6 months	12.24 (2.55-58.83)	0.002*	15.08 (2.94-77.34)	<0.001**
> 6 months	0.89 (0.37-2.15)	0.801	0.89 (0.35-2.22)	0.795

**Significant at p≤0.05, **Highly significant at p<0.01*

is not much difference between being in different economic categories. For example, participants in categories 3 and 4 (COR=0.56, 95% CI: 0.35-0.92) are 0.56 times as likely to practice early weaning compared to those in categories 1 and 2.

DISCUSSION

In Rwanda, despite numerous efforts to reduce early weaning prevalence, a significant proportion of breastfeeding mothers attending Remera Health Center continue to face challenges leading to early weaning. Identifying and addressing these issues is essential for developing targeted interventions and support mechanisms. This study sheds light on crucial challenges faced by breastfeeding mothers, emphasizing the need for tailored strategies.

The findings reveal that 51.6% of participants encountered various obstacles during their breastfeeding journey. Notably, prevalent challenges included low milk supply, child refusal to breastfeed, and maternal feelings of sadness or depression. Specifically, 21.6% of participants identified low milk supply as a significant concern, mirroring a common issue among breastfeeding mothers globally.

Low milk supply may stem from factors such as inadequate latch, maternal stress, or medical conditions affecting milk production. Addressing these underlying issues is imperative for improving the overall breastfeeding experience for mothers attending Remera Health Center. Targeted interventions aimed at enhancing latch techniques, providing stress management support, and addressing maternal emotional well-being can contribute significantly to overcoming these challenges and promoting successful breastfeeding outcomes [12]. Therefore, interventions aimed at addressing these underlying causes can contribute to improving breastfeeding success.

The reported instances of children refusing to breastfeed (8.1%) highlight a potential barrier to exclusive breastfeeding. Strategies such as promoting proper latch techniques and addressing infant oral issues may prove beneficial in overcoming this challenge [13]. Additionally, maternal emotional well-being, as evidenced by 6.2% experiencing sadness or depression while breastfeeding, emphasizes the need for comprehensive support systems and mental health resources for breastfeeding mothers [14]. However, none of the participants reported sore nipples or judgments about ceasing breastfeeding. This suggests that Remera Health Center might have a good program geared at encouraging breastfeeding and discouraging early weaning.

This study demonstrates a substantial awareness among participants regarding the consequences of early weaning. Future measures could focus on providing comprehensive information to mothers, in order to bridge the gap in knowledge, and, thereby, promoting the benefits of exclusive breastfeeding during the recommended period. This is evident where mothers were associated with practicing early weaning, reflecting their awareness and understanding of potential outcomes. Out of the 370 participants, a substantial majority of 90.8% (n=336) were aware of certain consequences linked to early weaning. The findings reveal that 33.5% (n=124) of mothers were well-informed about all the consequences listed, which included increased digestive problems, risks of allergies, lack of breast milk nutrients, risks of obesity, risks of respiratory problems, as well as choking. This suggests a comprehensive awareness among this subgroup of mothers regarding the potential risks and challenges associated with early weaning. Specifically, the most commonly acknowledged consequence was digestive issues, with 44.3% (n=165) of participants expressing concern. This is in line with existing literature highlighting the impact of early weaning on gastrointestinal health, potentially leading to digestive discomfort in infants [15]. Furthermore, 30.5% (n=113) recognized the lack of essential nutrients from breast milk as a consequence, emphasizing the importance of breastfeeding in providing optimal nutrition during the early months of life [13]. The participants also identified increased risks of allergies (28.9%, n=107), choking (25.5%, n=87), risk of obesity (12.7%, n=47), and risk of respiratory diseases (11.9%, n=44) as potential consequences of early weaning. These findings align with existing research that highlights the role of breastfeeding in reducing the incidence of allergies, promoting proper development, and protecting against respiratory infections, as well as atopic infections [14,16,17]. In contrast, a study conducted in low- and middle-income nations found no correlation between early weaning and blood pressure, cholesterol, or allergic illnesses like asthma [12]. Although, 9.2% of participants did not know any consequences of early weaning. This highlights the need for targeted educational interventions to ensure that all mothers are well-informed about the potential risks associated

with early weaning, thus enabling them to make informed decisions for their infants' health and well-being.

This study uncovered a prevalence of early weaning in this population, reaching 26.3%, with the majority opting to wean their babies at 4 months. One potential explanation for this trend is the conclusion of maternal leave at three months, posing a challenge for mothers to sustain breastfeeding upon their return to work. These findings are consistent with a recent study conducted in Kigali, which observed a gradual decline in exclusive breastfeeding prevalence from birth to 5 months. This decline may be attributed to heightened demand for baby food and maternal perceptions of breast milk insufficiency as the infant ages. [6].

The higher prevalence of early weaning in our study may be attributed to the fact that a significant proportion of breastfeeding mothers, particularly those aged 36-45 years old, are employed and have 2-4 children, leading to busy schedules and possibly normalizing early weaning practices based on past experiences as similar to the study done in united states and found that employment can impact the initiation, duration, and exclusivity of breastfeeding where the weaning rates were higher for women who went back to work before 12 weeks than for those who went back to work after 12 weeks or for those who stayed at home [18,19]. For example, tight work or study schedules emerged as primary obstacles, compelling mothers to introduce complementary foods before the recommended period, and mothers working in institutions far from home faced difficulty in finding time for frequent breastfeeding, prompting them to opt for early supplementation. Practicing early weaning as a result of employment was also concluded in the study done in Britain and Ireland, where they found that women employed full-time were less likely to initiate breastfeeding than mothers who were not employed/students [20]. In relation to the study done in Australia where they found that duration of breastfeeding is independently, negatively associated with early return to work [21]. Similar findings were reported in studies conducted in Turkey and Wajir County Referral Hospital, emphasizing low milk production as a common reason for early weaning [22, 23]. A study in Rwanda also highlighted the influence of employment as having a negative effect [6].

This study revealed no significant relationship between cultural beliefs and early weaning practices among the participants. This could be explained by the fact that Rwandan culture generally discourages early weaning [24]. Contrarily, a study conducted in Uganda revealed myths about exclusive breastfeeding persisting due to cultural beliefs [15], as same as a study done in Turkey, which found that sore nipples, societal judgments, and cultural or traditional beliefs triggered mothers to initiate early weaning [12].

Numerous investigations have pinpointed factors linked to early weaning, encompassing aspects such as first pregnancy, low birth weight, pacifier use, challenges in breastfeeding post-childbirth, delayed initiation of breastfeeding, absence of exclusive breastfeeding in the maternity period, maternal misconceptions regarding the optimal breastfeeding duration within the first six months, limited awareness of breastfeeding benefits, insufficient paternal support for breastfeeding, maternal employment, tobacco and alcohol consumption, young maternal age, and educational level [2, 6, 22, 23, 25, 26]. Our study aligns with these established findings, underscoring that age, occupation, number of children, and awareness regarding the recommended age to commence weaning are robustly associated with early weaning.

Using the cross-sectional study design, this study is limited in making a causal inference. Moreover, this study was conducted at a single health center, which might limit the generalizability of the findings countrywide. Therefore, longitudinal studies extending to multiple settings are recommendated to further explore determinants associated with early weaning.

CONCLUSION

The study at Remera Health Center in Rwanda highlights persistent challenges and factors contributing to early weaning despite ongoing breastfeeding promotion efforts. Common obstacles faced by participants included issues like low milk supply, child refusal to breastfeed, and maternal emotional well-being concerns. The absence of reported sore nipples or judgments about ceasing breastfeeding suggests effective programs at Remera Health Center encouraging breastfeeding and discouraging early weaning.

The study revealed substantial awareness among participants about the consequences of early weaning. The prevalence of early weaning in the studied population may be attributed to factors such as concluding maternal leave at three months, busy schedules of employed mothers with other children, and normalization of early weaning practices based on past experiences.

There was no significant relationship between cultural beliefs and early weaning practices among participants. Nevertheless, the study contributes to a broader understanding of early weaning factors, emphasizing the strong association of age, occupation, number of children, and awareness regarding the recommended age to commence weaning.

Addressing breastfeeding challenges, promoting comprehensive awareness, and tailoring interventions to the socio-cultural context are crucial steps in mitigating early weaning. By implementing targeted strategies and fostering a supportive environment, health systems can significantly enhance the breastfeeding experience for mothers at Remera Health Center, contributing to the broader goal of promoting optimal infant nutrition and well-being.

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Original Research

Open Access

Knowledge, attitude, and practices towards prevention of Tuberculosis among HIV-positive patients at Kibagabaga District Hospital, Rwanda, 2021

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ABSTRACT

INTRODUCTION: Globally, an estimated 10.3 million people fell ill with TB in 2021, especially for people living with HIV. This study was conducted to assess the knowledge, attitudes, and practices (KAP) of TB prevention among HIV patients at Kibagabaga District Hospital (KDH). This study on TB prevention knowledge, attitudes, and practices among HIV-positive patients at Kibagabaga District Hospital aims to improve public health practices and the lives of people living with HIV by identifying knowledge gaps, tailoring prevention strategies, encouraging early TB detection, and informing policy development

METHODS: An analytical cross-sectional study was conducted at Kibagabaga District Hospital (KDH) from November 2019 to February 2021. A sample size of 237 Participants was calculated using Epi-info software and selected through a stratified simple random sampling method. Data collection employed self-administered questionnaires, and analysis was performed using SPSS software version 23.

RESULTS: Among the 237 Participants, the demographics revealed a majority of females (60.3%), with nearly half (45.1%) being married. The private sector employed over half (52.5%) of the Participants. Primary education was the most common educational attainment (51.1%), and the 39-48 age group represented the largest portion (35.4%). Encouragingly, a significant majority demonstrated positive knowledge (86.9%), attitude (86.1%), and practices (91.6%) towards tuberculosis prevention.

CONCLUSION: While the study revealed positive overall knowledge, practices, and attitudes towards tuberculosis prevention among Participants, a potential knowledge gap regarding the specific cause of the disease was identified. This suggests that future health education efforts for HIV patients could benefit from further emphasis on understanding the causative agent of tuberculosis for even more comprehensive knowledge and ongoing positive behaviour towards prevention.

INTRODUCTION

Tuberculosis (TB) is a disease of major public health concern and the leading cause of death in people living with HIV/AIDS [1]. It is the most opportunistic infection among HIV-infected persons [1,2]. People living with HIV are 20 times more likely to develop active tuberculosis disease than people without HIV [3]. TB is the most common cause of HIV/AIDS-related death (4). TB/HIV co-infection is a significant global public health problem. In 2014, 1.2 million new cases of TB/HIV co-infection were estimated worldwide, and more prevalent in Africa [4]. In 2018, an estimated 10 million people fell ill with tuberculosis. Among them, 5.7 million were men, 3.2 million were women, and 1.1 million were children [5]. However, TB is curable and preventable. Rwanda faces a significant public health challenge with tuberculosis, particularly in Kigali city, due to its proximity to high-burden countries like DRC Congo, Tanzania, and Kenya [3]. According to the WHO 2018 report, Rwanda's TB incidence of 59/100,000 and TB/HIV co-infection rate of 12/100,000 exceed the global target of less than 10 cases/100,000 by 2035, highlighting the need for continued efforts [9].

An estimated 58 million lives were saved through TB diagnosis and treatment between 2000 and 2018 [4]. In 2005, Rwanda initiated a program for community diagnosis of TB. Community health workers played a crucial role by raising awareness about TB identification and encouraging people with coughs and their household contacts to seek diagnosis and treatment at health centres [9]. According to the DHS in 2012, 75% of participants did not seek care when experiencing symptoms suggestive of tuberculosis (TB). Inadequate knowledge about TB for people living with HIV results in increased transmission of TB and delay in health-seeking behaviour.

Studies showed that good knowledge about TB (definition of TB, causes, signs and symptoms, treatment and methods of prevention) influences positive behaviour by preventing a delay in health-seeking behaviour [3]. Negative attitudes such as feeling that HIV patients should not be concerned about TB were positively associated with TB transmission. Regarding practices, good practices in TB prevention such as covering the nose when coughing or sneezing, going to the health facility when he/she experiences TB-related symptoms, and being screened for TB help in the reduction of the transmission of TB infection [11].

Furthermore, certain behaviours, such as not undergoing TB testing, seeking treatment for general health conditions from traditional healers instead of healthcare facilities, and failing to complete preventive isoniazid therapy (IPT) among HIV-positive individuals, have been linked to increased TB transmission and the development of multidrug-resistant tuberculosis (MDR-TB) [11]. This study aims to assess knowledge, attitudes, and practices (KAP) regarding tuberculosis (TB) prevention and control among HIV-positive patients at Kibagabaga District Hospital in Rwanda. By addressing identified knowledge gaps and analyzing KAP, the study seeks to inform targeted interventions and educational programs to improve TB prevention and control measures for this vulnerable population, ultimately contributing to reducing the TB burden and enhancing public health outcomes in Rwanda.

METHODS

Study design: This study employed a cross-sectional quantitative design to assess knowledge, attitudes, and practices (KAP) regarding TB prevention and control among HIV-positive patients in Rwanda. Data was collected from 237 participants aged 18 and above attending the Antiretroviral Therapy (ARV) department at (KDH).

To ensure participant privacy, this study implemented the following measures: all data collection instruments were anonymized, meaning no names or other personally identifiable information (PII) were linked to the data. Data was stored securely on a password-protected server accessible only to authorized personnel. All research staff involved in the study signed confidentiality agreements.

Participants: Before participation, all individuals provided written informed consent in a language they understood. The consent form explained the study's purpose, procedures, potential risks and benefits, and participants' right to withdraw from the study at any time. The research protocol and informed consent process were reviewed and

approved by the University of Rwanda Research Board which ensured research adhered to ethical principles.

Sampling Technique: To ensure participant representation, stratified random sampling was employed. This technique involved dividing the study population into subgroups based on relevant characteristics and then randomly selecting Participants from each subgroup.
Daily attendees in the ARV department were first divided into two groups by sex (male and female. Within each sex group, Participants were further categorized into three age groups: 18-40 years, 41-62 years, and above 62 years. This ensures representation across different age demographics.
Using a random sampling technique, eight Participants were selected daily, maintaining a balance of three males and five females. This approach aimed to achieve a sample size sufficient for robust statistical analysis.

Sample size: The sample size of 237 was determined using Epi-info software, considering the total study population, a 95% confidence interval, and a 0.005 margin of error.

Data collection: A structured, self-administered questionnaire was the primary tool for data collection. This questionnaire, consisting of four sections, was developed based on a modified and validated version of the World Health Organization (WHO) tool titled "A guide to developing knowledge, attitude and practice surveys" (World Health Organization, 2018) [16]. This ensured the questionnaire's reliability and relevance to the study objectives.
The four sections of the questionnaire addressed: Sociodemographic characteristics: This section gathered information about Participants' age, sex, marital status, education level, and employment status. Knowledge: This section assessed Participants' understanding of TB transmission, symptoms, diagnosis, and prevention measures. Attitude: This section evaluated Participants' beliefs and perceptions towards TB and its management. Practices: This section explored Participants' behaviours related to TB prevention, such as seeking healthcare for symptoms or completing preventive treatments.

Data analysis: Data collected through the questionnaire was analyzed using the Statistical Package for the Social Sciences (SPSS) software version 23. Descriptive statistics, including frequencies and percentages, were used to summarize the findings. Results were presented in tables for clarity.

Scoring knowledge, attitude, and practices: Participants scoring above 50% on each section were categorized as having "good" knowledge, attitude, or practices, respectively. While this threshold is a common practice in KAP studies, it's important to acknowledge that other studies may use different cut-off points. Future research could explore the justification and potential implications of these varying thresholds.

RESULTS

Social-demographic characteristics of the participants (N=237)

The social demographic characteristics of the participants are presented in Table 1 below.

The study showed that the majority of participants were between 39 and 48 years old, with females slightly outnumbering males. Most participants were married and had a primary school education. Private work was the most common occupation, and most participants lived in urban areas. The majority had been receiving HIV treatment for 11-20 years.

Knowledge of participants about TB

The knowledge of all participants (237) was assessed by asking questions on the cause, transmission, signs and symptoms of TB, risk factors, and treatments of TB. Table 2 below shows the distribution of individual responses on the knowledge of participants about TB.

This study revealed positive knowledge among HIV patients regarding TB. While over 92% had heard about the disease and understood its airborne transmission, a significant gap existed in accurately identifying the bacterial cause, with many mistakenly attributing it solely to smoking. Additionally, most participants recognized common TB symptoms, risk factors for HIV-positive individuals, treatment options, and typical treatment durations.

Table 1: *Sociodemographic Characteristics of HIV-Positive Study Participants at KDH, Rwanda*

Socio-demographics		Frequency	Percentage
Gender of participant	Male	94	39.7
	Female	143	60.3
Marital status of a participant	Single	35	14.8
	Married	107	45.1
	Divorced/separated	51	21.5
	Widow/widower	44	18.6
Occupation of the participant	Public worker/government employee	13	5.5
	Private worker/work for others	125	52.7
	Domestic worker/self-employed	99	41.8
Education level of the participant	Primary	121	51.1
	Secondary	76	32.1
	University	15	6.3
	No formal education	25	10.5
Ubudehe category of participant	Category 1	46	19.4
	Category 2	102	43
	Category 3	82	34.6
	Category4	6	2.5
	Unknown	1	0.4
Residential area of the participant	Rural: Living in a small community with a low population density, typically outside of major towns or cities.	37	15.6
	Urban: Living in a densely populated area, typically characterized by a high concentration of buildings and infrastructure, often associated with cities and towns	158	66.7
	semi-urban	42	17.7
Age group of Participants	18-28 years	29	12.2
	29-38 years	59	24.9
	39-48 years	84	35.4
	49-58 years	53	22.4
	59-68 years	7	3
	69-78 years	5	2.1
Duration with HIV	1-10 years	103	43.5
	11-20 years	113	47.7
	21-30 years	18	7.6
	31-40 years	3	1.3

Table 2: *Knowledge of TB Among HIV-Positive Study Participants at KDH, Rwanda*

Knowledge		Frequency (n)	Percentage
Ever heard of an illness called TB	No.	17	7.2
	Yes.	220	92.8
Cause of Tuberculosis.	Bacteria.	65	27.4
	Witchcraft.	4	1.7
	Smoking.	122	51.5
	I do know.	46	19.4
Transmission of TB	Sharing hygienic materials with Tuberculosis (TB) patients.	90	38.0
	Air when a person infected with TB coughs or sneezes.	122	51.5
	I do know.	25	10.5
Signs of TB	Cough for more than 2 weeks, weight loss, persistent fever, and night sweats.	208	87.8
	Nose bleeding.	18	7.6
	Excessive urination.	4	1.7
	I do know.	7	3.0
Risk of developing TB disease	People who were vaccinated for TB.	29	12.2
	HIV patients.	197	83.1
	Sports person.	6	2.5
	I do know.	5	2.1
Treatments of TB	TB is curable by using herbal medicine.	5	2.1
	TB is curable by using medicine under the directly observed short-course treatment (DOTS).	208	87.8
	TB is curable by resting at home without medicines.	1	0.4
	TB IS not curable.	23	9.7
Treatment duration of TB	2 months.	10	4.2
	6 months or 9 months depending on its type.	186	78.5
	I don't know.	41	17.3

Attitude of participants toward TB

The attitude of the participants toward TB was assessed by asking questions about TB prevention as shown in the table below.

Table 3 shows the attitude responses of the participants toward TB. The majority of the participants, 94.1% believed that HIV-infected persons should be concerned about TB. The findings of our study show that 83.1% of the participants believe that TB is a serious disease. In addition, the majority of the participants,

Table 3: *Distribution of Responses to Individual Items Regarding Attitudes Towards Tuberculosis (TB)*

Attitude		Frequency	Percentage
HIV infected people should be concerned about TB.	No	6	2.5
	Yes	231	97.5
	I don't know	8	3.4
TB is a serious disease.	No	39	16.5
	Yes	197	83.1
	I don't know	1	0.4
Being sad and hopeless if told to have TB.	No	163	68.8
	Yes	71	30
	I don't know	3	1.3
A person with TB should be rejected by the community.	No	144	60.8
	Yes	89	37.6
	I don't know	4	1.7
Feeling of keeping family member's TB secret.	No	103	43.5
	Yes	132	55.7
	I don't know	2	0.8

68.8%, believe that they should not be sad and hopeless if they are told to have TB. The majority of Participants, 60.8%, believe that a person who has TB disease should not be rejected by the community. The survey results suggest that a significant portion of participants (55.7%) might be hesitant to disclose a family member's TB due to potential stigma, highlighting the need for interventions to address stigma and promote open communication about TB.

Practices of participants toward tuberculosis prevention

The practices of all participants (237) were assessed by asking questions about TB prevention and Table 4 shows the responses.

As shown in Table 5, the findings show that 13.1% of participants had poor knowledge of TB prevention and 86% had positive attitudes regarding TB. Results show that 8.4% had poor preventive practices toward TB.

DISCUSSION

Knowledge: This study found that the majority of participants (86.9%) demonstrated good knowledge about TB. While comparable to studies in similar settings [3], a knowledge gap regarding the specific cause of TB was identified, with a significant portion incorrectly associating it solely with smoking. This highlights the need for healthcare providers to emphasize transmission routes and causative agents (Mycobacterium tuberculosis) during TB prevention education for HIV patients.

The study revealed a generally positive attitude toward TB among participants (86.1%), comparable to previous research in Rwanda [3]. This improvement is likely attributed to ongoing community-level interventions delivered by peer educators and healthcare workers. However, a minority of participants (16.5%) expressed a need for further education on the seriousness of TB prevention. Additionally, while most participants (68.8%) understood that TB is not a cause for hopelessness, a concerning number (30%) expressed potential negative emotional responses to a TB diagnosis. Addressing these concerns through counselling and emphasizing the curability of TB is crucial.

The study found that the majority of participants (91.6%) reported good TB preventive practices, exceeding findings from previous studies in Rwanda [3]. This improvement potentially stems from heightened awareness of respiratory hygiene practices due to the COVID-19 pandemic. However, several areas require further focus:

Table 4: *Self-Reported Practices of Tuberculosis (TB) Prevention Among HIV-Positive Study Participants*

Practice	Responses	Frequency	Percentage
Covering his/her nose and mouth when sneezing or coughing.	No	18	7.6
	Yes	217	91.6
	I don't know	2	0.8
Going to the traditional healer if he/she was sick to treat a general health problem.	No	208	87.8
	Yes	27	11.4
	I don't know	2	0.8
Going to a health facility when he/she realizes his /her symptoms are related to Tuberculosis (TB)	No	12	5.1
	Yes	224	94.5
	I don't know	1	0.4
Necessary to finish TB treatment if TB patients feel better after 2 months of treatment	No	102	43.0
	Yes	128	54.0
	I don't know	7	3.0
Ever been tested for Tuberculosis or screened for TB before	No	115	48.5
	Yes	120	50.6
	I don't know	2	0.8
TB patients spitting everywhere will spread the disease?	No	26	11.0
	Yes	203	85.7
	I don't know	8	3.4

Traditional healer reliance: While most participants (87.7%) preferred seeking medical help from professionals, a concerning number (11.4%) reported visiting traditional healers. Educational interventions can address this by emphasizing the importance of proper TB diagnosis and treatment through the healthcare system.

While over half of participants (54%) acknowledged the importance of completing TB treatment despite feeling better, almost half (43%) displayed poor adherence practices. Educational efforts should emphasize the significance of completing the full treatment regimen to prevent drug resistance.

Although half of the participants (50.6%) recognized the importance of TB screening, nearly half (48.5%) had never been screened. Integrating routine TB screening into HIV care and promoting

Table 4: *Overall distribution of Responses to Individual Items Regarding KAP scores categories Towards Tuberculosis (TB) Among HIV-Positive Study Participants*

Score		Frequency	Percentage
Knowledge score	Good knowledge	206	86.9
	Poor knowledge	31	13.1
Attitude score	Positive attitude	204	86.1
	Negative attitude	33	13.9
Practice score	Good practices	217	91.6
	Poor practices	20	8.4

its benefits is essential. The majority (85.7%) understood the risks associated with improper spitting by TB patients, but almost 11% lacked this knowledge. Continued education is crucial to promote safe practices and prevent transmission.

This cross-sectional study design limits causal inferences. Additionally, self-reported data may be susceptible to recall bias. Future research could explore longitudinal designs and utilize objective measures to address these limitations.

CONCLUSION

The study found that over half of the respondents demonstrated good knowledge, positive attitudes, and good practices towards TB prevention. However, a knowledge gap regarding the specific cause of TB was identified, with a majority incorrectly associating it with smoking alone. This highlights the need for healthcare providers to strengthen educational efforts for HIV patients about TB prevention, with an emphasis on its transmission routes and causative agent (Mycobacterium tuberculosis).

Beyond the general findings, further research is crucial to explore the factors associated with good KAP (Knowledge, Attitude, and Practices) towards TB prevention among HIV patients. These factors may include age, marital status, duration of HIV infection, smoking history, and education level. Identifying such associations can inform targeted interventions tailored to specific patient groups, ultimately enhancing KAP and improving overall TB prevention strategies.

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Original Research

Open Access

An assessment of barriers to implementation of school health program in primary schools in Ido/Osi, Southwest, Nigeria: a qualitative study

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ABASTRACT

INTRODUCTION: School Health Program is an event that promotes the understanding, maintenance, and improvement of the school community's health and ensures that children are at all times in a state of optimum health. The implementation of School Health Programme in most parts of Nigeria is, however, poor or suboptimal. The objective of the study was to assess the quality of the School Health Programme being implemented in Ido/Osi Local Government Area, Southwest Nigeria.
METHODS: Focused group discussions were carried out among 4 different groups of 8 participants each, with each group comprised of different administrative heads and health instructors. The qualitative study was carried out among primary schools in the Ido/Osi local government area in Southwest Nigeria. The data were analyzed using a thematic framework approach for qualitative data analysis.
RESULTS: Administrative heads and health teachers lacked in-depth knowledge of the School Health Programme. Most private schools had good buildings but the majority of public schools had dilapidated structures. All schools had at least a source of water. Toilet facilities were present in a few public schools and in all private schools. Most of the schools practice open dumping of refuse. All the schools had a first aid box but with varying content. Only one private school had a school nurse. All the schools send a child with suspected communicable diseases home. Free mid-day meals are available in public schools but lacking in private ones.
CONCLUSION: The study revealed the poor state of SHP in Ido/Osi and identified deficiencies in the effective implementation of SHP.

INTRODUCTION

School Health Programme (SHP) involves a series of coordinated events that promote the understanding, maintenance, and improvement of the school community's health [1,2]. It is multidisciplinary and involves cooperation from schoolteachers, school administrators, health educators, environmental officers, physicians, nurses, and other stakeholders who appraise, promote, protect, and maintain the health of all members of the school community [2]. The

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objectives of the SHP are to obtain a rapid and sustained improvement in the health of school children and ensure that school children are in a state of optimum health at all times so that they can attain their physical and intellectual potential [3].
Primary school education is the first level of formal and structured education, forming the bedrock of any other educational attainment. Hence, there is a need to make primary schools and their environment healthy to promote school pupils' health. The SHP is a cost-effective way of meeting the health needs of children [2]. Promoting the health of the school populace is a critical step towards quality achievement in education.
Unfortunately, implementation of SHP in most parts of Nigeria has been generally poor or suboptimal, and implementation varies from place to place [4-8]. Low levels of health knowledge among teachers, scarcity of health education teachers, and inadequate resources for teaching are some of the factors noted by previous studies to militate against the effective implementation of SHP in Nigeria [5,6]. Furthermore, weak school policy, insufficient time allocation to the teaching of health, minimal support from non-governmental agencies and other community members, lack of vision, inadequate planning, lack of accountability, inadequate coordination and collaboration between the government and schools, as well as lack of program infrastructure have also been noted [4, 7, 8]. However, these factors vary from region to region and even vary within the same geographical area.

In recent times, the government of Ekiti State made efforts to improve primary school education. These efforts included the commencement of free school meals for pupils in primary one to primary three, rehabilitation of dilapidated structures, and supply of educational materials and kits to public primary schools [9, 10]. The school feeding program is meant to improve the health status and academic performance of pupils. It also aims to improve school enrolment and decrease school absenteeism [9]. These government efforts are meant to improve SHP implementation in the state. This study assessed the quality of SHP implemented in Ido/Osi Local Government Area (LGA), Southwest Nigeria, identified areas needing intervention, and offered suggestions to the relevant stakeholders and authorities.

METHODS

A qualitative study was carried out using focused group discussions (FGDs) among primary schools in Ido/Osi LGA, in Ekiti State, Southwest Nigeria. The State has six tertiary educational institutions and three teaching hospitals. According to the 2006 Census, the LGA has a total population of 159,114 people [11]. The main source of drinking water is well water, with an irregular supply of tap water and electricity.
There are 72 primary schools (52 public schools and 20 private schools) in the LGA, which serve the educational needs of the local people.
Participants were recruited purposively. They comprised administrative heads and school health instructors, as both groups are key stakeholders in the implementation of SHP [2, 5, 8]. Four focused groups comprising eight participants each were selected for the FGD. Two groups (one for private and one for public) contained only the schools` administrative heads, while the other two groups (one for private and one for public) comprised only the school health instructors.
Ethical approval was obtained from the Research and Ethics Committee of the Federal Teaching Hospital (ERC/2018/08/31/136A), the State Ministry of Education (EK/ED/SCHLS/84/VOLII/177), and the State Universal Basic Education Board (EKSUBEB/SS/57/57). Also, participants were asked to sign a consent form before the commencement of the interviews.
A round table interview was conducted with each FGD in the staff room on separate days. The staff room is quiet, and confidentiality is maintained as only participants for the FGDs were allowed in during the discussion period. Each participant in the group was asked to respond to questions asked by the researcher one after the other. An interview guide with a stem of 10 questions was used. There was audio recordings of the discussion sessions. In addition, a checklist was used to obtain relevant information on their sociodemographics, as well as SHP knowledge/awareness and implementation in their respective schools from the participants. Furthermore, field notes were taken by the researchers and their assistants. Interviews were conducted in private settings, each taking forty-five minutes to one hour. The participants' responses were noted and recorded until they reached their saturation point.
The data was transcribed and analyzed using the

thematic framework approach for qualitative data analysis [12].

RESULTS

Of the 32 participants, 5 were males, while 4 were not married. Respondents' educational qualifications are shown in Table 1. Of the respondents from public schools, 68.8% had Nigeria Certificate in Education (NCE), 25.0% had a Bachelor in Education (B. Ed), and 6.2% had a Bachelor of Science, while 37.5%, 37.5%, 18.8%, and 6.2% respondents from the private schools, had NCE, B. Ed, BSc, and Higher National Diploma (HND) respectively.

Table 1: *Educational qualification of respondents for focused group discussion*

Qualification	Public (%)	Private (%)
NCE	11 (68.8)	6 (37.5)
B. Ed	4 (25.0)	6 (37.5)
BSc	1 (6.2)	3 (18.8)
HND	-	1 (6.2)
Total	16 (100)	16 (100)

NCE: Nigeria Certificate in Education; B. Ed: Bachelor in Education; HND: Higher National Diploma; BSc: Bachelor of Science

Awareness and knowledge of school health program: Most of the participants have heard about SHP through various means like radio, internet, health officials, seminars, and during the course of their training as a teacher. However, all eight health teachers from the public schools claimed ignorance of SHP and its components. None of the participants could give a clear definition of SHP as they all had different ideas on the subject.

"SHP is about the health of school pupils. Teaching pupils not to injure themselves by playing with sharp objects. And giving them reasons why they should stay away from playing with sharp objects".

"A mean whereby we impact the children on how to take care of themselves and take care of minor injury".

Concerning components of the school health programme, none of the participants knew all the components.

"Nutrition, personal health, safety education, counseling, physical activities"

Healthy School Environment: Most of the respondents demonstrated knowledge of what constitutes a healthy school environment. However, respondents varied in their responses on what is obtainable in the school environment in their respective schools. In terms of school buildings, most private schools had good structures and facilities, with few having leaky roofs. However, public schools had more dilapidated structures with broken windows, broken floors, absent ceilings, and leaky roofs.

"School buildings are of normal size with strong walls. We have few leaky roofs" in private schools.

"Our buildings are fair with broken windows and doors with, some leaky roof and ceilings" public school.

"Buildings are strong, broken floors, some leaky roof", public school.

All the interviewed private school participants claimed they had a water source located within the school, either in the form of a well or a borehole. However, some public schools had to go outside the school to access water.

"No water within the school. We get water from a borehole in a mission house not far from the school", public school.

Refuse disposal was by open dumping by all the schools except one private school that uses an incinerator. In the same vein, one in four public schools had no toilet for sewage disposal. However, all the private schools had toilet facilities. Also, of all the schools represented, only one private and one public school had a complete fence; most schools either had no fence at all or were incomplete.

"We have security to control traffic and teachers monitor pupils while playing, no playing with sharp objects" private school.

"No playing close to dilapidated structure, supervision during playing" public school.

School Health Services: Only one private school had an auxiliary nurse in its sick bay. None of the schools carried out pre-school medical screenings or routine health examinations by specialists. However, all the schools carried out routine health inspections mainly on Mondays. Also, the majority of the schools had a first aid box but with varying degrees of content. Few had no content in their first aid box. Most of the respondents had an idea of what constitutes the content of a first aid box.

"Paracetamol, cotton wool, spirit, iodine, bandage, gelusil, mixmag, vitamin C", "Stethoscope, thermometer"

On how to manage a communicable disease, all the schools send a child with a suspected communicable disease home. Few schools give health talks on communicable diseases, but none of the schools give immunization except the supplemental immunization organized by the government. During emergencies, the schools with available first aid materials render first aid and then refer the child to the nearest Primary Health Centre. No school had a trained first aider.

"In a case of an emergency, we render first aid and call the parent before referring to the health center."

About one-third of the respondents had a book for health records where they only recorded treatment given to pupils after first aid. One private school had a health record book that was commulative and transferable.

All the public schools benefitted from the federal government Home Grown School Feeding (HGSF) program. None of the private schools served food. However, some private schools had a buttery where the pupils could purchase snacks. Respondents vary in their responses to the quality and quantity of the food the HGSF program provides.

"The quantity is fair but the quality is okay."

"Nutritious, but small quantity"

"Terribly small with no quality."

The respondents had an idea of the benefits of a good school meal.

"A good school meal increases the school population, provides one quality meal a day as some pupils do not eat to school."

"It provides essential nutrients."

"Reduces school absenteeism, increases enrolment, and improves the child's mental and academic performance."

School Health Instruction: On health instruction, the schools do not practice a rotational form of teaching where a subject teacher teaches the same subject to all the arms of the primary school. Only the public pilot schools practice a rotational form of teaching. Occasionally, voluntary groups and health personnel visit the schools to teach the pupils and teachers about health. Some private schools, with pupils whose parents are health workers, leverage the opportunity to ask the parents for a health talk.

"We do not practice a rotational form of teaching. It is only pilot schools like SUBEB that have such."

"Voluntary groups like the Red Cross occasionally visit." Health is being taught three times a week in all the schools. Most public schools lacked instructional materials like chats and audio-visual aids. The private schools fared better in terms of instructional materials.

"We have a few chats on the care of the body and teeth, use of water."

None of the teachers undergo regular in-service training on health. They are only exposed to health training when it is being organized by the government.

"We occasionally go for training only when the government invites us."

"Since I have been in school, I have not attended any health seminars. The headmasters choose who to represent the school whenever the government invites us for a health seminar."

"We have a lot of kids in our school whose parents are doctors. We use the opportunity to organize health talks, especially during a disease outbreak like Lassa or Ebola. They educate the pupils and the teachers. And we also go for government-organized health seminars."

Constraints to effective School Health Programme

The participants identified the following constraints to the effective delivery of SHP in the schools: lack of political will, funding from the government and PTA, and lack of health personnel and first aid materials. Also, poor managerial skills of the HMs, lack of potable water, fences, and gates, lack of cooperation from the parents, religious bias on the part of the parents, dilapidated buildings, lack of toilets, and lack of effective PTA.

"Inadequate PTA relationship, low awareness on health, lack of cooperation from the parents, fund"

"Religiosity, some parents prevented giving pupils' medication for deworming given to us by the government."

DISCUSSION

This study revealed that the implementation of SHP in Ido/Osi LGA was inadequate. This is not surprising as the administrative heads and health teachers who are the arrowheads in the implementation of SHP in the schools lacked in-depth knowledge on the subject matter as they could not define nor say the components of the SHP correctly. A study by Ofovwe and Ofilli and Bisi-Onyemaechi et al., in Edo and Enugu States, respectively, noted that no head teacher had adequate knowledge of SHP [7,13].

Despite the teachers' educationally related qualifications, this did not impact their awareness of SHP. Incorporation of SHP into the Teacher Education Curriculum, appropriate training on school health, and regular in-service training are needed for school teachers to fill their knowledge gaps, as trained teachers are more likely to continue implementing the SHP compared to teachers who are not trained [14].

Most of the respondents demonstrated knowledge of what constitutes a healthy school environment. However, respondents varied in their responses on what is obtainable in their respective schools, thus indicating varied implementation. Most private schools had good structures and facilities, with few having leaking roofs. However, the public schools had more dilapidated structures with broken windows, broken floors, absent ceilings, and leaking roofs. These findings are similar to other studies done in Nigerian primary schools [4,15-17]. The presence of dilapidated buildings portends danger as they could collapse, killing or maiming the pupils. They could also constitute a negative factor in the psyche of school children who are in their formative years. The lack of ceilings or incomplete ceilings predisposes pupils to heat during the day, causing discomfort to maximum learning. All the private schools interviewed had a source of water located within the school, either in the form of a well or a borehole. However, some public schools had to go outside the school to access water. The location of water outside the school premises threatens water adequacy for various uses, thereby putting the schools at risk of disease outbreaks associated with water shortage/lack.

The lack of toilet facilities in some of the schools, mostly the public schools, could predispose pupils to unhygienic waste disposal, thereby putting them at risk of environmental pollution and disease epidemics. Most of the schools practice open dumping. This practice is not peculiar to the current study, as other studies reported similar findings [4,7,18-20]. Open dumping of refuse serves as a breeding site for flies, mosquitoes, and rodents. Children could also suffer injuries from sharp objects in these refuse sites.

The lack of a complete fence in some schools gives intruders easy access. Animals could freely graze within the school premises, destroying the aesthetics and also litter the environment with dung. Likewise, humans may use the school compound for games like football and smoking centers, litter the classrooms with human excrement, and destroy some of the facilities.

Only one private school had an auxiliary nurse in its sick bay. The low availability of health personnel in schools is similar to findings by Olatunya et al., in Ilesha, southwest Nigeria, and Alex-Hart et al., in Rivers State, South Nigeria but below the recommended national average of at least 17% [3,21,22]. With the paucity of health personnel, minor ailments are unattended to early. These could progress to debilitating illnesses that could lead to school absenteeism [21].

None of the schools carry out pre-school medical screening or routine health examinations by specialists. This is similar to the findings noted in Rivers State [22]. However, the observation that all the schools carried out routine health inspections at least once a week, mainly on Mondays, is commendable, and this has been reported by previous studies, giving an indication that teachers in Nigerian primary schools routinely carry out this aspect of pupils` health appraisal [21, 23]. Also, the majority of the schools had a first aid box but with varying degrees of content. Few boxes had no content. The incompleteness of the first aid box content could imply that minor cuts and injuries sustained during school hours would be left unattended due to a lack of first aid materials.

Pupils with suspected communicable diseases like measles and chicken pox are sent home by all the schools. Other authors noted this practice, which could be due to the fear of spreading such disease within the school community [24,25].

As observed in this study, the lack of adequate school records is worrisome. Poor record keeping was also documented in some previous Nigerian studies [22,25]. Lack of health personnel and knowledge of the importance of health records could contribute to poor record keeping.

The Federal Government free meal HGSF program was enjoyed by all the public schools. This is similar to the findings in Osun State and Ekiti State but at variance with the findings in Ogun State, where midday meals were available in all the schools but at a non-subsidized cost to the pupils, thus raising the need for universal applicability/implementation of free school meal program in the study area and across Nigeria irrespective of the type of school ownership [21,26,27]. The participants also reported a steady decline in the quality and quantity of food served

in the public schools, as noted by the teachers and head teachers. This may be due to the paltry value placed on a plate of meals, the increase in the cost of raw food in the market or the lack of monitoring of the food vendors by appropriate government agencies. There is a need to address the lapses observed in the free school meal program so that school children could benefit from the SHP implementation in the study area and Nigeria by extension. A well-implemented school meal provides essential nutrients, reduces school absenteeism, increases enrolment, and improves a child's mental and academic performance [26,27]. Teachers with poor knowledge of health issues were delivering health instruction in most of the schools. This shortcoming is noted by various authors across the country [8,28,29]. Same teacher teaches all the subjects in a class may lead to poor delivery of health instruction. As observed in this study, private schools took advantage of pupils whose parents are health personnel for health talk, while public school teachers depended on the occasional in-service training organized by the government. In-service training exposes teachers to updates on health and better prepares them to teach health. Teaching aids like chats were lacking in most of the schools. This is discouraging as children tend to recall better what they hear and see, thus suggesting that the use of multiple synergistic teaching methods represents the best approach to delivering health instructions in schools [29]. The lack of educational materials and good knowledge of SHP is not peculiar to this study, as similar findings have been noted in previous studies across the country [28,30]. There is a need for critical stakeholders to come to the rescue of SHP implementation in Nigeria.

There are some limitations to consider for this study. Some head teachers may have intentionally given inaccurate information (lie bias) or unintentionally (recall bias) on certain questions. Also, there was a lack of time and available resources to interview all stakeholders involved in SHP in the State vis a vis the Commissioner of Education in the state, representative of the LG implementation committee, representatives of the Parent-Teacher Association, community and students, etc.

CONCLUSION

The study revealed the poor state of SHP in Ido/Osi and also identified deficiencies in both human and material resources needed for the effective implementation of SHP. Also noted is the poor awareness of the teachers on the concept of SHP. Critical stakeholders saddled with the maintenance of school health and related government functionaries need to rise to stem the tide of poor SHP implementation in Nigeria.

The following recommendations are proffered: The curriculum for training teachers should be reviewed with components of SHP given the pride of place it deserves. This should be backed with regular in-service training and seminars on SHP to improve teachers' awareness and knowledge of SHP. All primary schools need to have a well-constituted and functional school health committee. Also, the stakeholders, especially the State Government to review its commitment to SHP by providing the necessary manpower, materials, and financial aid needed to make SHP more efficiently practiced, and regular/periodic on-the-spot monitoring/follow up on enforcement of minimum standards required of schools for the implementation of the SHP is advocated.

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Original Research

Open Access

Epidemiological profile of abdominal surgical emergencies in adults at the Saint-Louis Regional Hospital (Senegal) between 2021 and 2022: a cross-sectional study

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ABSTRACT

INTRODUCTION: Abdominal surgical emergencies are relatively common conditions, with a frequency varying between 20 and 22.7%. Understanding their epidemiological profile would help tailor medical interventions to improve access to care and prognosis. The objective of this study is to describe the epidemiological profile of abdominal surgical emergencies in adults at the Regional Hospital Center of Saint-Louis, Senegal.

METHODS: A cross-sectional descriptive study was conducted from June 1, 2021, to May 30, 2022, in the General Surgery Department of the Regional Hospital Center of Saint-Louis, Senegal. It included all patients aged 15 years and above who presented with an acute abdomen (operated or not). The study collected sociodemographic, clinical, paraclinical, and therapeutic data.

RESULTS: During the study period, 1,228 emergencies were received, of which 275 were abdominal surgical emergencies, resulting in an annual hospital incidence of 22.3%. Of these patients, 191 were male and 84 were female, with a male-to-female ratio of 2.3. The mean age was 39.6 years, with a standard deviation of 18.3 (ranging from 15 to 88 years). The majority of patients (80.0%) arrived at the hospital on their own, with the dominant means of transportation being personal vehicles (68.4%). The most common pathologies were appendicular pathologies (25.1%), followed by strangulated hernias (16.7%), peritonitis (16.7%), intestinal obstructions (15.3%), and abdominal traumas (12.7%). The mean waiting time for surgical management was 50.1 hours, ranging from 8 to 72 hours. General anesthesia was the most commonly used method (66.5%), and surgical treatment was the predominant approach (78.2%). The in-hospital mortality rate was 5.8%.

CONCLUSION: The most affected patients were young men, and the most frequent emergency was appendicitis and its complications. Patients are mostly transported to the hospital on their own using personal vehicles. Despite the relatively low in-hospital mortality rate, the conditions for managing abdominal surgical emergencies remain limited.

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INTRODUCTION

Abdominal surgical emergencies are clinical syndromes characterized by "severe, localized, and rapidly onset abdominal pain caused by a variety of disorders, injuries, or diseases, typically requiring emergency surgical interventions"[1,2]. They are relatively common conditions with a frequency varying between 20 and 22.7%[3]. They are associated with significant mortality, mainly due to delays in consultation and administration of treatments [4]. These emergencies affect individuals of all ages and can be caused by different etiologies, among which appendicitis, peritonitis, and intestinal obstruction predominate [5]. A good knowledge of the epidemiological profile of these emergencies would make it possible to adapt medical interventions in order to improve access to care and the prognosis. This would help improve the quality of care for patients, tailor risk assessments, and implement preventive measures based on the causes and types of patients affected. In Senegal, various studies have been conducted to evaluate acute abdomen, revealing a high prevalence among other emergencies (20.8%), with a high mortality rate, particularly for patients aged, reaching 20.7% in certain series [6,7]. The objective of this study was to describe the epidemiological profile of abdominal surgical emergencies in adults within the Regional Hospital Center of Saint-Louis, Senegal.

METHODS

This descriptive cross-sectional study used secondary data from June 1, 2021, to May 30, 2022. All patients received in the General Surgery department of the Regional Hospital Center for an acute abdomen (operated or not), aged at least 15 years, were included in the study. The non-inclusion criteria were abdominal emergencies due to gynecological, obstetrical, urological or vascular causes. Data collection was done on an electronic form developed with SPSS 23 software. The same software was used for the analysis. The parameters studied were: sex, age, waiting time(duration between hospital arrival and administration of surgical or medical treatment), time of admission, means of transport, etiologies, type of treatment, and case fatality rate (dead or alive in hospital). The qualitative variables are described according to their frequencies (absolute and/or relative), and the quantitative variables are in the form of averages with their standard deviation and extremes.

RESULTS

During the study period, 275 files were collected from a total of 1228 patients who came to the emergency department for consultation, representing an annual hospital incidence of 22.3%. All the files collected were able to be studied.

The average age was 39.6 years, with a standard deviation of 18.3. The extremes were 15 years and 88 years. The age group between 15 and 25 years was the most represented, with a number of 80 patients (29.1%). Table 1 shows the distribution of patients by age. Regarding sex, there were 191 men and 84 women.

The most used means of transport to evacuate patients at the Saint-Louis Regional Hospital Center was the personal vehicle in 68.4% (n=188). The other means of transport used were ambulance (14.5%), taxi (13.5%), and fire brigade (3.6%).

The majority of patients were seen between 12 p.m. and 4 p.m., with 17.4%. Table 1 shows the distribution of patients according to time of admission.

Etiologies of Abdominal Surgical Emergencies

The diagnosis of acute appendicitis dominated with a relative frequency of 25.1%. Strangulated hernias and acute generalized peritonitis came in 2nd position with equal frequencies of 16.7%. Bowel obstructions and trauma followed with respective frequencies of 15.3% and 12.7%. Table 1 represents the distribution of patients according to etiology.

The average waiting time for surgical treatment was 50.1 hours, with extremes of 8 and 72 hours.

In our study, 46 patients (16.7%) had not undergone surgery. Among the operated population, the most used anesthetic procedure was general anesthesia (66.5%). Spinal anesthesia was used in 10.2% of cases and local anesthesia in 6.5%.

There were 3 therapeutic methods: surgery in 78.2% (n=215), medical or non-operative treatment in 16.7%, and instrumental treatment in 5.1%.

During hospitalization, 16 patients died, representing a case fatality rate of 5.8%.

Table 1: *Distribution of patients according to gender and age (n=275)*

	Gender				Age												Total	
	Female		Male		[15-25[		[25-35[		[35-45[		[45-55[		[55-65[		[65-88]			
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Time of admission																		
[00H-04H[	5	1.8	9	3.3	5	1.8	2	0.7	0	0.0	1	0.4	1	0.4	0	0.0	14	5.1
[04H-08H[	1	0.4	5	1.8	0	0.0	4	1.5	0	0.0	0	0.0	1	0.4	0	0.0	6	2.3
[08H-12H[	11	4.0	27	9.8	10	3.6	7	2.5	8	2.9	3	1.1	7	2.5	3	1.1	38	13.8
[12H-16H[	18	6.5	30	10.9	16	5.8	6	2.2	6	2.2	10	3.6	4	1.5	5	1.8	48	17.4
[16H-20H[	15	5.5	27	9.8	10	3.6	9	3.3	3	1.1	4	1.5	6	2.2	10	3.6	42	15.3
[20H-00H[	9	3.3	34	12.4	15	5.5	6	2.2	8	2.9	1	0.4	7	2.5	6	2.2	43	15.7
Unspecified	26	9.5	58	21.1	18	6.5	19	6.9	15	5.5	12	4.4	11	4.0	9	3.3	84	30.4
Appendicitis																		
Acute appendicitis	9	3.3	44	16	26	9.5	8	2.9	5	1.8	4	1.5	1	0.4	0	0.0	53	19.3
Appendiceal abscess	6	2.2	6	2.2	8	2.9	4	1.5	0	0.0	0	0.0	0	0.0	0	0.0	12	4.4
Appendicular mass	1	0.4	3	1.1	1	0.4	0	0.0	1	0.4	2	0.7	0	0.0	0	0.0	4	1.5
Peritonitis																		
Complicated appendicitis	10	3.6	19	6.9	15	5.5	7	2.5	2	0.7	4	1.5	1	0.4	0	0.0	29	10.5
Ulcer perforation	2	0.7	9	3.3	0	0.0	7	2.5	3	1.1	0	0.0	1	0.4	0	0.0	11	4
Small bowel perforation	2	0.7	1	0.4	0	0.0	1	0.4	1	0.4	0	0.0	1	0.4	0	0.0	3	1.1
Ruptured ovarian abscess	2	0.7	0	0	1	0.4	1	0.4	0	0.0	0	0.0	0	0.0	0	0.0	2	0.7
Ruptured liver abscess	0	0	1	0.4	0	0.0	0	0.0	1	0.4	0	0.0	0	0.0	0	0.0	1	0.4
Strangulated hernias																		
Inguinal hernia	2	0.7	21	7.6	1	0.4	3	1.1	1	0.4	6	2.2	7	2.5	5	1.8	23	8.4
Umbilical hernia	3	1.1	6	2.2	0	0.0	1	0.4	1	0.4	1	0.4	2	0.7	4	1.5	9	3.3
Midline hernia	5	1.8	0	0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.7	3	1.1	5	1.8
Scrotal hernia	3	1.1	0	0	0	0.0	1	0.4	0	0.0	0	0.0	1	0.4	1	0.4	3	1.1
Incisional hernia	3	1.1	0	0	0	0.0	0	0.0	0	0.0	0	0.0	2	0.7	1	0.4	3	1.1
Recurrent inguinal hernia	0	0.0	2	0.7	0	0.0	0	0.0	0	0.0	0	0.0	2	0.7	0	0.0	2	0.7
Diaphragmatic hernia	1	0.4	0	0	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	1	0.4

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Table 1 continued...

Bowel obstruction																	
Sigmoid volvulus	1	0.4	13	4.7	2	0.7	4	1.5	1	0.4	2	0.7	5	1.8	0	0.0	14	5.1
Adhesions	6	2.2	6	2.2	1	0.4	2	0.7	2	0.7	1	0.4	2	0.7	4	1.5	12	4.4
Colon tumor	2	0.7	5	1.8	0	0.0	1	0.4	1	0.4	1	0.4	1	0.4	3	1.1	7	2.5
Functional obstruction	3	1.1	2	0.7	0	0.0	0	0.0	0	0.0	1	0.4	4	1.5	0	0.0	5	1.8
Anal tumor	0	0	1	0.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	1	0.4
Small bowel tumor	0	0	1	0.4	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	0	0.0	1	0.4
Rectal tumor	0	0	1	0.4	0	0.0	0	0.0	0	0.0	0	0.0	0	0.0	1	0.4	1	0.4
Intussusception	1	0.4	0	0	0	0.0	0	0.0	1	0.4	0	0.0	0	0.0	0	0.0	1	0.4
Abdominal trauma																		
Blunt	5	1.8	20	7.3	9	3.3	7	2.5	8	2.9	0	0.0	0	0.0	1	0.4	25	9.1
Penetrating	0	0	10	3.6	7	2.5	2	0.7	0	0.0	1	0.4	0	0.0	0	0.0	10	3.6
Others																		
Liver abscess	5	1.8	9	3.3	4	1.5	2	0.7	1	0.4	4	1.5	2	0.7	1	0.4	14	5.1
Non-specific abdominal pain	4	1.5	6	2.2	4	1.5	0	0.0	0	0.0	2	0.7	2	0.7	2	0.7	10	3.6
Acute cholecystitis	4	1.5	2	0.7	3	1.1	0	0.0	0	0.0	2	0.7	1	0.4	0	0.0	6	2.2
Acute pancreatitis	2	0.7	3	1.1	0	0.0	0	0.0	2	0.7	1	0.4	1	0.4	1	0.4	5	1.8
Acute cholangitis	2	0.7	0	0	0	0.0	0	0.0	1	0.4	0	0.0	1	0.4	0	0.0	2	0.7

DISCUSSION

Abdominal surgical emergency is a frequent reason for consultation and admission, representing 20.8% of emergency consultations in some previous Senegalese studies [6]. Many authors agree that acute abdomen surgery represents the majority of the visceral surgeon's activity in Africa [5,8,9]. During our study period, there were 1228 emergency department consultations, including 275 abdominal surgical emergencies (22.3%). These data are lower than those of Attipou in Lomé, who found that surgical emergencies constituted 54.2% of all hospitalized emergencies [10]. These differences are due to the fact that the inclusion criteria vary depending on the study.

In our series, the patients were relatively young, with an average age of 39.6 years. Indeed, this can be explained by the fact that the etiologies of these emergencies more often affect young adults (appendicitis and its complications) (15-25 years) [10,11].

The male gender was predominant. The most frequent emergencies in men were acute appendicitis, colonic volvulus, and abdominal trauma. Several other authors in Africa find this same male predominance, including Gaye in Dakar, with a sex ratio of 2.9 [11]. This is explained by the exclusion of obstetric emergencies in these studies and the predominance of abdominal trauma in men. Besides, penetrating traumas were exclusively present in men. This could be explained by the fact that most of these penetrating trauma happened during assaults mainly involving men [12].

During our study, the peak daily admission of patients was between 12 p.m. and 4 p.m., with 17.4%. The same observation was made in a study in Dakar, where the patient arrival rate increased rapidly from 8 a.m. to a maximum between 12 and 4 p.m. [13].

The means of transport were non-medical (personal vehicle (68.4%) and taxi (13.5%)). In Senegal, the medical transport system, such as the Emergency Medical Assistance Service (SAMU), is not yet included in the population's habits. This system is more used in cases of patient transfer from one structure health to another. It is most often initiated by medical personnel when the patient's condition requires medical supervision. In addition, the geographic coverage of ambulances means that sometimes, the patient's place of residence is closer to medical structures than to the location of the SAMU.

Among the causes of abdominal surgical emergencies, appendicular pathologies represented the most common conditions, with a frequency of 25.1%. These results are more similar to the African series in which appendicitis was the primary cause of acute surgical abdomens [14,15]. However, appendicular pathologies came third or fourth after bowel obstruction, peritonitis, and sometimes strangulated hernias in several other studies [8,11,16]. This could be justified by the fact that for some, appendicular peritonitis was not counted in the number of appendicular pathologies but only in that of peritonitis.

Strangulated hernias occupied an important place in emergency surgical activities. They represented 16.7% of parietal and digestive surgical emergencies. These results are similar to the 16.5% found by El Messaoudi [17]. This high proportion of hernias admitted urgently is due to the lack of resources and the wait-and-see attitude of patients who only consult in cases of strangulation [18].

Peritonitis represented the second most common cause of digestive surgical emergencies and accounted for 16.7%. Gaye found a similar proportion of 25% in Dakar [11]. In Niger, Magagi describes a greater proportion (51.6%) of peritonitis as the cause of digestive surgical emergencies. This difference could be associated with the long surgical treatment times in his study [3].

Occlusions represented 15.3% and were the 4th cause in the study. Sigmoid volvulus represented the leading cause of these obstructions (33.3%), ahead of adhesions (28.6%). Several African authors describe this same predominance [5,19]. This is due to a higher prevalence of colon volvulus in Africa, which is linked to diet and the pelvic colon of Africans, which would be longer [20].

Abdominal trauma was found in 35 patients or 12.7% of all diagnoses encountered. This frequency was comparable to that of Sambo in Benin (10%) [21]and lower than that of El Messaoudi in Senegal (23.2%) [17]. These differences could be due to the non-inclusion of trauma having undergone non-operative treatment in certain studies.

The average waiting time for surgical treatment was 50.1 hours, with extremes of 8 and 72 hours. This long wait would be due to several factors, such as financial constraints and the long time it takes to obtain additional imaging and biological explorations, which are sometimes unavailable. There is also the unavailability of the operating room, given the limited number of operating rooms

compared to needs and the insufficient number of operating room staff [22]. It has been shown by previous studies that a long waiting time can be associated to a higher post-operative complications in abdominal surgical emergencies [23].
In our study, the case fatality rate was 5.8%. A variable rate was found in other African studies (4.9% in Senegal and 12% in Niger) [11,16]. This significant number of deaths could be improved by faster and more appropriate care.

One limitation of our study was a possible selection bias since our study was limited to one hospital in a defined period, limiting the generalizability of the findings. In addition, the study included only patients from a specific region in Senegal. The findings may not fully reflect the diversity of the entire Senegalese population or other populations with different socio-economic and cultural characteristics. The epidemiological profile may differ in other regions or healthcare settings, and the results may not be representative of the broader population. Besides, a longer study period could evaluate the seasonal variations or trends in abdominal surgical emergencies.

CONCLUSION

The most affected patients were young men, and the most frequent emergency was appendicitis and its complications. Patients are mostly transported to the hospital on their own using personal vehicles. Despite the relatively low case fatality rate, the conditions for managing abdominal surgical emergencies remain limited in our context. The long consultation and treatment delays can be significantly improved. Optimizing technical resources and procedures would improve performance.

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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).

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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

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