

## Research

### Prevalence and factors associated with suicidal behaviors among domestic workers

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#### Abstract

**Background** Due to urbanization and changes in family structure, the need for domestic workers has surged in many developing countries, including Rwanda. While being employed as a domestic worker presents financial benefits to many of them and their dependents, it also comes with risks and difficulties that might harm the domestic worker's mental health.

**Aim** This study aimed to determine the prevalence and factors associated with suicidal behaviors (i.e., suicidal ideations, plans, and attempt(s)) among domestic workers in Rwanda.

**Method** In this cross-sectional study, data was captured from 884 domestic workers in Kigali, Rwanda. Suicidal ideation was measured using questions from the General Health Questionnaire (GHQ-28), while suicide attempts and plans were measured using questions adopted from previous studies in the region. The methods used/plan to attempt suicide were also captured from individuals with a recent history of suicide plan/attempt(s). Three separate regression models were employed to ascertain the factors associated with suicidal behaviors.

**Results** The prevalence of past-year suicidal behaviors was 32.5% for suicidal ideations, 9.5% for suicide plans, and 7.8% for suicidal attempts. Being female and having a chronic medical illness were linked to a higher risk of participating in any form of suicidal behavior. Suicidal ideations were less likely to occur among those who attained secondary education. However, more years of working as a domestic worker were associated with an increased likelihood of suicidal ideations. Having more than five dependents at work increased the likelihood of experiencing suicidal plans or attempts among domestic workers. For those who attempted suicide, overdosing with medications/drugs was the most common method of attempting.

**Conclusion** Domestic workers have prevalent suicide behaviors, especially among females and those with a chronic medical illness, more years of work experience, and those with many household members at work. Based on the present study, for domestic workers at risk, there is a critical need for focused mental health interventions and support networks in various sectors of the domestic labor force.

**Keywords** Domestic workers · Suicidal ideations · Rwanda · Suicide · Prevalence · Employment

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## 1 Introduction

Domestic work is a vital yet often undervalued sector in global labor markets, providing essential services within private households [1–3]. Domestic work includes a variety of tasks done for pay in households in Kigali, like cleaning, cooking, childcare, gardening, and more [4]. Domestic workers are highly vulnerable to various forms of abuse and exploitation. These include physical, sexual, and verbal abuse.

In developing nations, including Rwanda, the demand for domestic workers has witnessed a significant surge, driven by urbanization, changing family structures, and the growing need for dual-income households [5–7]. While domestic employment presents financial opportunities, it also comes with special risks and difficulties that might have a negative effect on a domestic worker's mental health [8]. Global conversations about mental health have placed a greater emphasis on how important it is to recognize and address the particular difficulties faced by marginalized and vulnerable groups such as domestic workers [9]. Domestic workers stand out among these categories as a demographic that is frequently exposed to unfavorable working conditions, a lack of social support, and economic vulnerabilities—all of which might increase the risk of mental health issues [10–12].

Rwanda, renowned for its post-genocide rehabilitation efforts and exponential economic growth, has witnessed a surge in the demand for domestic workers [12]. Despite this increase in the number of domestic workers, they remain vulnerable to abuse and exploitation since they generally have no social protection [13–15]. In addition, mental health services to such vulnerable groups are still developing, thus putting many domestic workers at risk of having complications of poor mental and psychological well-being, such as suicidal behaviors, which can easily lead to death by suicide. Suicidal behaviors (i.e., suicidal ideation, plans, and attempts) among vulnerable groups like domestic workers represent a serious but under-addressed public health concern [14, 15]. Suicidal ideation among adults in a home has been linked to child maltreatment which makes the problem even more concerning.

Based on a review of popular databases no study has explored the prevalence and factors associated with suicidal behaviors among domestic workers. However, in countries like Lebanon, it is estimated that one foreign domestic worker (FDW) commits suicide weekly [16]. Based on a 2008 Human Rights Watch report, the identified causes of death included forced confinement, excessive work demands, employer abuse, punishments from employers, isolation, earning below the minimum wage, depression, and financial pressures from their families to send them money [17]. Frequent occurrences of psychological, physical, and sexual abuse, coupled with the experience of being separated from one's home and enduring social isolation, contribute as prominent risk factors for suicide among domestic workers [16, 18]. One of the main methods for dying by suicide was falling from a height [17].

Despite recommendations to have more studies among this population by other researchers [18], this vulnerable group has been under-studied. Therefore, the present study aims to add to the limited body of literature on domestic workers by exploring suicidal behaviors among domestic workers in Rwanda. The study presents both the prevalence and factors associated with the various forms of suicidal behaviors among domestic workers in Rwanda.

## 2 Methods

### 2.1 Study design and setting

This was a cross-sectional study among domestic workers in Kigali, Rwanda. The data collection was done by the Health Development Initiative (HDI) Rwanda by the Helsinki Declaration. We excluded domestic workers with less than 3 months of experience at their job since they might have spent a short time, which may impede an accurate experience.

### 2.2 Data collection

All information was collected by trained research assistants who were skilled in data collection, research ethics, questionnaire administration, and handling sensitive questions.

The research team met with Community Health Workers (CHWs) to explain the study's objectives and inclusion criteria, and requested that they invite all domestic workers from their area. In Kigali, each CHW is assigned a specific number of

households within a village. Domestic workers were informed about the study and invited to come to a nearby health center at a time of their convenience to engage with the trained research assistants for data collection.

Individuals willing to join the study provided consent using a form translated into the local language (Kinyarwanda). Research assistants guided the potential participants who could not read or write through the consent form, and their consent forms were signed in the presence of a witness. The obtained written consent forms were securely stored at HDI offices. Each participant was assigned a unique identification number to ensure data anonymity and prevent the same participants' enrollment multiple times. The research assistants, who are native Kinyarwanda speakers, guided and/or assisted all participants in answering the questionnaire to ensure they could respond appropriately. To ensure consistency, research assistants used translated questionnaires to collect data from participants. Professional translators fluent in both English and Kinyarwanda translated the questionnaires, which were then back-translated to English to ensure accuracy. The questionnaires were pretested from April 8th to May 12th, 2023, ensured the measures were comprehensible. The content of the questionnaire was checked by a psychiatrist conversant with the language. During data collection, we prioritized participants' well-being. All participants expressing suicidal ideation or serious symptoms were referred to counselors at health facilities. Those identified as at risk for violence received guidance on accessing legal assistance from local authorities.

### 2.3 Study tools and measures

A pretested questionnaire was used to extract participant's data. The present study explored socio-demographic information (i.e., age in completed years, gender, marital status, education level, age of starting to work, year of experience, number of people in the house of work, monthly salary, number of children, number of siblings, household members at work, history of substance use, history of being arrested by the law, history of being managed for mental illness, history of any chronic disease, and sexual orientation) and suicidal behaviors based on the General Health Questionnaire (GHQ-28) [19].

Following the methodology of previous studies [19–21], suicidal ideation was measured using one item which was drawn from the General Health Questionnaire (GHQ-28)—“In the past 12 months, have you ever thought about taking your own life or committing suicide?”. Responses are scored on a 4-point Likert-type scale where ‘not at all/definitely not’ scored 0, ‘no more than usual/I don't think so’ scored 1, ‘rather more than usual/has crossed my mind’ scored 2, and ‘much more than usual/ definitely has’ scored 3. The scores of 2 and 3 were considered positive for suicidal ideations.

### 2.4 Suicide attempts and suicide plans

The items used to assess suicide attempts and plans were adopted from a study by Kaggwa et al. 2021 [20]. The questions were as follows: (a) suicide plans were assessed using the question “In the past 12 months, have you planned suicide? (yes/no).” (b) suicide attempts were assessed based on “In the past 12 months, have you attempted suicide? (Yes/no)” For those who responded yes to the items b, the following follow-up questions were asked based on: (i) the severity of a suicide attempt, “in the past 12 months, did you need treatment as a result of attempting suicide? (Yes/no).”, (ii) frequency of suicide attempt; “the past 12 months, how frequently did you attempt suicide? (iii) the methods used to attempt suicide include jumping from a height, self-immolation, and drug overdoses (including pharmaceuticals, veterinary drugs, pesticides, and herbicides), among others.

To clarify the intent of the suicide attempts, we first assessed suicidal ideation and subsequent attempts. Participants who reported suicide attempts were asked about their expected outcomes if the attempt succeeded.

### 2.5 Data analysis

Data were analyzed using STATA version 16.0. Descriptive statistics (i.e., percentages, frequencies, means, medians, interquartile ranges, and standard deviations) were used to present the data. The Shapiro-Wilks test and histograms were also employed to determine whether the data were normally distributed based on the Gaussian assumption. The replies' frequencies and percentages were used to analyze the types and techniques of suicide attempts. To identify the variables linked to suicidal behaviors (suicidal thoughts, suicide plans, and suicide attempts), separate regression analyses were performed. Suicidal ideation, suicide plans, and suicide attempts were studied using logistic regression analysis. Following a test for collinearity based on the variance inflation factor (VIF), all significant factors at bivariate regression were included in the

adjusted model to account for confounding variables. The final models considered variables having a VIF of under two. A *p*-value of 0.05 or less was considered significant for the 95% confidence interval.

### 3 Results

#### 3.1 Study participants

A total of 884 individuals accepted the invitation (who came to the health facility following being approached by the CHWs) and consented to participate in the study. However, only 875 agreed to provide information regarding their suicidal behaviors since not all questions were compulsory. The average age of all participants was  $21 \pm 4.8$  years. Most of the participants were female (73.8%,  $n = 646$ ), not married (97.3%,  $n = 851$ ), and had less than five children (99.0%,  $n = 856$ ). On average, most participants had  $3.5 \pm 3.6$  years of work experience.

#### 3.2 Distribution of suicidal behaviors across the various domestic worker's sociodemographic characteristics

##### 3.2.1 Suicidal ideations

The prevalence of suicidal ideation among housemaids was 32.5% ( $n = 287$ ), with a 95% confidence interval (CI) of 29.4% to 35.6%. Female participants significantly reported experiencing more suicidal ideations than males (35.3% vs 25.7%,  $\chi^2 = 6.97$ ,  $p$ -value = 0.008). Domestic workers who had a chronic illness experienced more suicidal ideations than those without (55.4% vs 31.1%,  $\chi^2 = 11.12$ ,  $p$ -value < 0.001). Domestic workers who had primary education as their highest level of education reported having more suicidal ideations than those with secondary and tertiary education as their highest levels of education (36.5% vs 27.0% vs 33.3%,  $\chi^2 = 8.41$ ,  $p$ -value = 0.015). See Table 1.

##### 3.2.2 Suicidal plans

The prevalence of suicidal plans among housemaids was 9.5% ( $n = 84$ ), CI = 7.7%—11.6%. Female domestic workers reported having more suicidal plans than the (11.3% vs 4.6,  $\chi^2 = 8.22$ ,  $p$ -value = 0.004). Domestic workers who were gay, lesbian, and bisexual reported having more suicidal plans than heterosexuals (33.3% vs 9.4%,  $\chi^2 = 3.92$ ,  $p$ -value = 0.048). Those with more than five children reported having more suicidal plans than those with less than five children (33.3% vs 9.2%,  $\chi^2 = 6.03$ ,  $p$ -value = 0.014). Similarly, those with more than five household members at work reported having more suicidal plans than those with less than 5 (17.9% vs 8.6%,  $\chi^2 = 8.41$ ,  $p$ -value = 0.004). Domestic workers who had a chronic illness had more suicidal plans than those without (24.6% vs 8.4%,  $\chi^2 = 18.15$ ,  $p$ -value = < 0.001). See Table 1.

##### 3.2.3 Suicidal attempt

The prevalence of suicidal attempts among housemaids was 7.8% ( $n = 69$ ), CI = 6.2%–9.7%. Female participants significantly reported having had more suicide attempts than males (9.6% vs 3.1%,  $\chi^2 = 9.96$ ,  $p$ -value = 0.002). Domestic workers who were gay, lesbian, and bisexual reported more suicidal attempts than heterosexuals (33.3% vs 7.7%,  $\chi^2 = 5.39$ ,  $p$ -value = 0.020). Those with more than five children reported more suicidal attempts than those with less than five children (33.3% vs 7.4%,  $\chi^2 = 7.97$ ,  $p$ -value = 0.005). Similarly, those with more than five dependents reported more suicidal attempts than those with less than 5 (17.9% vs 6.7%,  $\chi^2 = 14.66$ ,  $p$ -value = < 0.001). Domestic workers who had a chronic illness had more suicidal attempts than those without (23.1% vs 6.7%,  $\chi^2 = 22.21$ ,  $p$ -value = < 0.001). Only 33.3% ( $n = 23$ ) of those who had attempted suicide required treatment following the attempts. See Table 1. Most individuals ( $n = 24$ ) had attempted suicide either once or twice and 58% had used drug overdose as a method of suicide attempt. See Fig. 1.

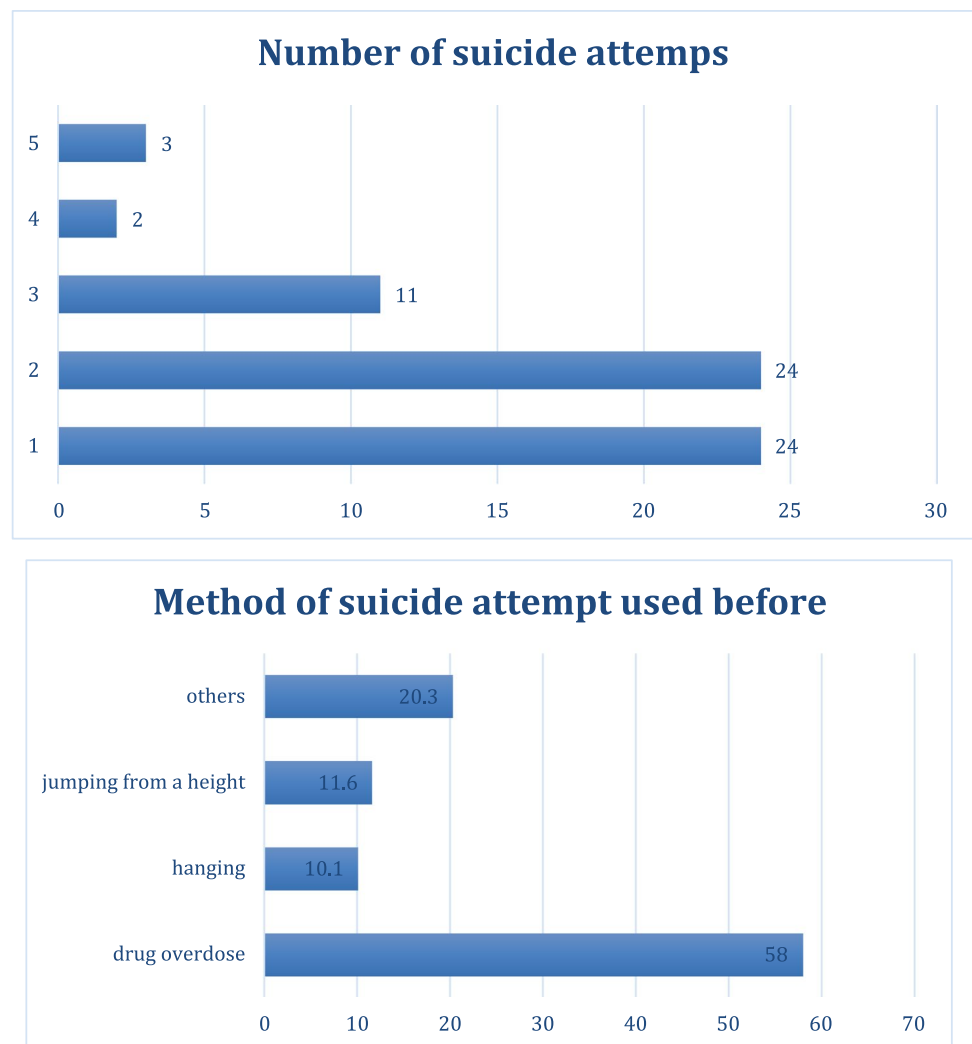
**Table 1** Distribution of Sociodemographic and work-related characteristics of domestic workers in Rwanda across suicidal behaviors

Variable	All participants n (%)		Suicidal ideation n (%)		Suicidal plan n (%)		Suicidal attempts n (%)	
	Yes	t/X2 (p value)	Yes	t/X2 (p value)	Yes	t/X2 p-value	Yes	t/X2 p-value
Age (Mean, SD)	21 (4.8)	- 1.98 (0.048)	22, 4.5	- 1.98 (0.048)	22, 4.9	- 1.15 (0.248)	22, 5.1	- 1.24 (0.213)
Sex								
Male	229 (26.2)		59 (25.7)	6.97 (0.008)	11 (4.8)	8.22 (0.004)	7 (3.1)	9.96 (0.002)
Female	646 (73.8)		228 (35.3)		73 (11.3)		62 (9.6)	
Sexual orientation								
Gay, lesbian, or bisexual	6 (0.7)	3.14 (0.076)	4 (66.8)		2 (33.3)	3.92 (0.048)	2 (33.3)	5.39 (0.020)
Heterosexual	869 (99.3)		283 (32.6)		82 (9.4)		67 (7.7)	
Marital status								
Single	851 (97.3)	0.68 (0.409)	281 (33.0)		82 (9.6)	0.04 (0.831)	68 (8.0)	0.47 (0.493)
Married	24 (2.7)		6 (25.0)		2 (8.3)		1 (4.2)	
Highest level of education								
Primary	526 (60.1)	8.41 (0.015)	192 (36.5)		53 (10.1)	1.21 (0.546)	43 (8.2)	0.16 (0.921)
Secondary	337 (38.5)		91 (27.0)		29 (8.6)		25 (7.4)	
Tertiary	12 (1.4)		4 (33.3)		12 (16.7)		1 (8.3)	
Number of siblings (Mean, SD)	5 (12)	0.34 (0.734)	5, 2.4		4, 2.2	0.40 (0.688)	5, 2.6	0.21 (0.837)
Number of children								
Less than 5	857 (98.9)	0.00 (0.980)	282 (32.9)		79 (9.2)	6.03 (0.014)	66 (7.4)	7.97 (0.005)
5 or more	9 (1.0)		3 (33.3)		3 (33.3)		3 (33.3)	
Number of dependents								
Less than 5	857 (98.9)	0.42 (0.516)	253 (32.5)		67 (8.6)	8.41 (0.004)	52 (6.7)	14.66 (<0.001)
5 or more	9 (1.0)		34 (35.8)		17 (17.9)		17 (17.9)	
Had a disability								
No	833 (95.2)	0.35 (0.550)	275 (33.0)		77 (9.2)	2.54 (0.111)	63 (7.6)	2.49 (0.115)
Yes	42 (4.8)		12 (28.6)		7 (16.7)		6 (14.3)	
Substance use								
No	687 (79.4)	1.83 (0.176)	218 (31.7)		69 (10.0)	0.42 (0.516)	55 (8.0)	0.00 (0.951)
Yes	178 (20.6)		66 (37.1)		15 (8.4)		14 (7.9)	
History of being arrested								
No	834 (95.4)	1.77 (0.183)	270 (32.4)		80 (9.6)	0.01 (0.932)	65 (7.8)	0.25 (0.613)
Yes	41 (4.5)		17 (42.5)		4 (10.0)		4 (10.0)	
History of being managed for mental illness								
No	860 (98.3)	0.343 (0.558)	281 (32.8)		82 (9.6)	0.24 (0.625)	67 (7.8)	0.61 (0.434)
Yes	15 (1.7)		6 (40.0)		2 (13.3)		2 (33.3)	

**Table 1** (continued)

Variable	All participants n (%)		Suicidal ideation n (%)		Suicidal plan n (%)		Suicidal attempts n (%)	
	Yes	t/X2 (p value)	Yes	t/X2 (p value)	Yes	t/X2 p-value	Yes	t/X2 p-value
Had a chronic illness								
No	810 (92.5)	251 (31.1)	68 (8.4)	11.12 (<0.001)	54 (6.7)	18.15 (<0.001)	22.21 (<0.001)	
Yes	65 (7.5)	36 (55.4)	16 (24.6)		15 (23.1)			
Age of starting work (Median, IQR)	17 (16–19)	0.71 (0.480)	17 (16–19)		17 (16–18)	0.74 (0.458)	0.44 (0.658)	
Working experience in years (Median, IQR)	2 (1–5)	–4.94 (<0.001)	4 (2–6)		4 (2–6)	–3.44 (0.001)	–3.26 (0.001)	
Monthly salary (Mean, SD)	18,377 (10,092)	0.06 (0.953)	19,691 (7826)		19,479 (6932)	–1.26 (0.2209)	–0.94 (0.345)	
Had additional source of income (n=867)*								
No	38 (4.4)	17 (44.7)	5 (13.2)	2.53 (0.111)	4 (10.5)	0.59 (0.442)	0.36 (0.550)	
Yes	829 (95.6)	268 (32.3)	78 (9.4)		65 (7.8)			
Monthly salary from alternative income source (only 137 responded)								
Less than 10,000	119 (86.9)	42 (35.3)	20 (16.8)	1.45 (0.229)	17 (14.3)	0.00 (0.988)	0.13 (0.716)	
Equal or more than 10,000	18 (13.1)	9 (50.0)	3 (16.7)		2 (11.1)			
Number of people living in the house								
Less than 5	398 (45.5)	136 (34.2)	33 (8.3)	0.59 (0.443)	28 (7.0)	1.46 (0.226)	0.74 (0.389)	
More or equal to 5	476 (54.5)	151 (31.7)	51 (10.7)		41 (8.6)			
Needed treatment as a result of suicide attempt								
Less than 5	23 (33.3)							

**Fig. 1** Number of suicide attempts and the methods of suicide attempts. The “others” category of suicide attempts, methods include stabbing (using sharp objects to inflict severe injury) and drowning (submerging oneself in water to induce asphyxiation)



### 3.3 Factors associated with suicidal behaviors.

#### 3.3.1 Suicidal ideations

Table 2 shows bivariate analyses of factors associated with suicide ideations and they include being female, having secondary education as the highest level of education, having a chronic illness and having more years of work experience. These were tested for collinearity before being included in the final model, and they had VIFs below 2, with a mean VIF of 1.22. At multivariate analysis, being female (aOR = 1.44, CI = 1.02–2.03,  $p$ -value = 0.038), having a chronic illness (aOR = 2.57, CI = 1.52–4.36,  $p$ -value < 0.001) and more years of work experience (aOR = 1.06, CI = 1.01–1.11,  $p$ -value = 0.012) increased the likelihood of having suicidal ideations. However, having secondary education as the highest level of education (aOR = 0.70, CI = 0.52–0.95,  $p$ -value = 0.024) reduced the likelihood of having suicidal ideations. See Table 3.

#### 3.3.2 Suicidal plans

From the bivariate analyses, factors associated with having suicide plans included being female, having more than five children, having more than five dependents, having a disability, having a chronic illness, and having more years of work experience (Table 2). These were tested for collinearity before being included in the final model, and they had VIFs below 2, with a mean VIF of 1.21. At multivariate analysis, being female (aOR = 2.29, CI = 1.17–4.48,  $p$ -value = 0.016), having more

**Table 2** Bivariate logistic regression for factors associated with suicide behaviors

Variable	Suicidal ideation		Suicidal plan		Suicide attempt	
	cOR(CI)	p-value	cOR(CI)	p-value	cOR(CI)	p-value
Age	1.03 (0.99–1.05)	0.051	1.02 (0.98–1.07)	0.249	1.03 (0.98–1.07)	0.215
Sex						
Male	1 (ref)		1 (ref)		1 (ref)	
Female	1.57 (1.12–2.20)	0.009	2.52 (1.31–4.85)	0.005	3.37 (1.52–7.46)	0.003
Sexual orientation						
Gay, lesbian and bisexual/other	1 (ref)		1 (ref)		1 (ref)	
Heterosexual	0.24 (0.04–1.33)	0.102	0.21 (0.04–1.15)	0.073	0.17 (0.03–0.92)	0.041
Marital status						
Single	1 (ref)		1 (ref)		1 (ref)	
Married	0.68 (0.27–1.72)	0.412	0.85 (0.20–3.69)	0.831	0.50 (0.06–3.76)	0.501
Highest level of education						
Primary	1 (ref)		1 (ref)		1 (ref)	
Secondary	0.64 (0.48–0.86)	0.004	0.84 (0.52–1.35)	0.473	0.90 (0.53–1.50)	0.687
Tertiary	0.89 (0.26–2.92)	0.822	1.78 (0.38–8.36)	0.462	1.02 (0.13–8.10)	0.984
Number of siblings	1.00 (0.98–1.01)	0.742	0.98 (0.87–1.08)	0.643	1.00 (0.96–1.03)	0.844
Number of children						
Less than 5	1 (ref)		1 (ref)		1 (ref)	
5 or more	1.02 (0.25–4.10)	0.980	4.92 (1.20–21.04)	0.026	5.98 (1.46–24.47)	0.013
Number of dependents						
Less than 5	1 (ref)		1 (ref)		1 (ref)	
5 or more	1.16 (0.74–1.81)	0.517	2.32 (1.29–4.14)	0.005	3.04 (1.68–5.52)	<0.001
Had a disability						
No	1 (ref)		1 (ref)		1 (ref)	
Yes	0.81 (0.40–1.60)	0.550	2.32 (1.29–4.14)	0.005	2.03 (0.83–5.01)	0.122
Substance use						
No	1 (ref)		1 (ref)		1 (ref)	
Yes	1.26 (0.89–1.79)	0.176	0.82 (0.46–1.48)	0.517	0.98 (0.53–1.81)	0.951
History of being arrested						
No	1 (ref)		1 (ref)		1 (ref)	
Yes	1.54 (0.81–2.93)	0.186	1.05 (0.36–3.02)	0.932	1.31 (0.45–3.81)	0.614
History of being managed for mental illness						
No	1 (ref)		1 (ref)		1 (ref)	
Yes	1.36 (0.48–3.87)	0.559	1.45 (0.32–6.55)	0.627	1.81 (0.40–8.20)	0.440
Had a chronic illness						
No	1 (ref)		1 (ref)		1 (ref)	
Yes	2.75 (1.65–4.59)	<0.001	3.55 (1.92–6.58)	<0.001	4.19 (2.20–7.94)	<0.001
Age of starting work	1.00 (0.99–1.01)	0.632	0.99 (0.97–1.02)	0.840	0.99 (0.99–1.01)	0.773
Working experience in years	1.07 (1.02–1.11)	0.001	1.06 (1.01–1.11)	0.022	1.06 (1.01–1.12)	0.022
Monthly salary	1.00 (0.99–1.00)	0.954	1.00 (0.99–1.00)	0.221	1.00 (0.99–1.00)	0.351
Had additional source of income						
No	1 (ref)		1 (ref)		1 (ref)	
Yes	0.59 (0.30–1.14)	0.115	0.69 (0.26–1.80)	0.445	0.72 (0.24–2.10)	0.551
Monthly salary from alternative income source						
Less than 10,000	1 (ref)		1 (ref)		1 (ref)	
Equal or more than 10,000	1.83 (0.68–4.97)	0.234	0.99 (0.26–3.74)	0.988	0.75 (0.16–3.56)	0.717
Number of people living in the house						
Less than 5	1 (ref)		1 (ref)		1 (ref)	
More or equal to 5	0.89 (0.67–1.18)	0.443	1.33 (0.83–2.10)	0.227	1.25 (0.76–2.05)	0.390



**Table 3** Multivariate logistic regression for factors associated with suicide behaviors

Variable	Suicidal ideation		Suicidal plan		Suicide attempt	
	aOR(CI)	p-value	aOR(CI)	p-value	aOR(CI)	p-value
Age	0.99 (0.96–1.03)	0.620	0.95 (0.90–1.01)	0.106	0.97 (0.90–1.03)	0.288
Sex						
Male	1 (ref)		1 (ref)		1 (ref)	
Female	1.44 (1.02–2.03)	0.038	2.29 (1.17–4.48)	0.016	3.13 (1.37–7.19)	0.007
Highest level of education						
Primary	1 (ref)					
Secondary	0.70 (0.52–0.95)	0.024				
Tertiary	0.81 (0.23–2.84)	0.743				
Sexual orientation						
Gay, lesbian and bisexual/other gay, lesbian and bisexual /other					1 (ref)	
Heterosexual					0.21 (0.03–1.29)	0.092
Number of children						
Less than 5			1 (ref)		1 (ref)	
5 or more			3.63 (0.67–19.84)	0.136	2.78 (0.46–16.94)	0.266
Number of dependents						
Less than 5			1 (ref)		1 (ref)	
5 or more			2.15 (1.15–4.01)	0.016	2.77 (1.45–5.29)	0.002
Had a disability						
No			1 (ref)			
Yes			1.84 (0.74–4.60)	0.186		
Had a chronic illness						
No	1 (ref)		1 (ref)		1 (ref)	
Yes	2.57 (1.52–4.36)	<0.001	3.37 (1.74–6.52)	<0.001	4.12 (2.09–8.14)	<0.001
Years of work experience	1.06 (1.01–1.11)	0.012	1.06 (1.00–1.14)	0.079	1.05 (0.97–1.14)	0.186

than five dependents (aOR = 2.15, CI = 1.15–4.01,  $p$ -value = 0.016) and having a chronic illness (aOR = 3.37, CI = 1.74–6.52,  $p$ -value < 0.001) increased the likelihood of having suicidal plans See Table 3.

### 3.3.3 Suicidal attempts

At bivariate analysis, factors associated with having attempted suicide included being female, one's sexual orientation, having more than five children, having more than five dependents, having a disability, having any other chronic illness, and more years of work experience (Table 2). These were tested for collinearity before being included in the final model, and they had VIFs below 2, with a mean VIF of 1.21. At multivariate analysis, being female (aOR = 3.13, CI = 1.37–7.19,  $p$ -value = 0.007), having more than five dependents (aOR = 2.77, CI = 1.45–5.29,  $p$ -value = 0.002) and having a chronic illness (aOR = 4.12, CI = 2.09–8.14,  $p$ -value < 0.001) increased the likelihood of suicide attempts. See Table 3.

## 4 Discussion

The present study assessed the prevalence of suicidal ideations, plans, and attempts among Rwandan domestic workers as well as the associated factors that go along with them. Suicidal ideation accounted for 32.5% of all suicidal behaviors in the past year; suicide plans accounted for 9.5%, and suicidal attempts accounted for 7.8%. Having a chronic medical condition and being female were associated with an increased likelihood of engaging in any suicidal behavior. Suicidal ideations were less likely to occur among those who attained secondary education as compared to those who had a primary level of education or less. However, more years of working as a domestic worker were associated with an increased likelihood of suicidal ideations. Having more than five household members at work increased the likelihood

of experiencing suicidal plans or attempts among domestic workers. For those who attempted suicide, overdosing with medications/drugs was the most common method of attempt.

The prevalence of suicidal ideation among domestic workers in the present study was higher than 8.8% among textile workers in Ethiopia [22], among the general population in various countries [23, 24], 9.8% among medical professionals [25]; suggesting that domestic workers may be particularly susceptible to higher levels of suicidal ideations. Similar to suicidal ideations, the prevalence of suicidal plans and attempts was also higher than the general population in previous studies [24, 26]. The high prevalence of suicidal behaviors observed in this study may be indicative of unique stressors and vulnerabilities specific to the experiences of domestic workers [12], underscoring the pressing need for targeted interventions and support systems within the domestic work sector to address the mental health challenges faced by this vulnerable population [18, 27, 28]. We encourage future researchers to investigate suicidal behaviors in this unique population to reduce complications such as those reported in Lebanon, where one domestic worker died by suicide every week [17].

Most of the participants in the present study reporting attempts reported the use of a drug overdose (i.e., pharmaceuticals, veterinary drugs, pesticides, and herbicides). This finding is contrary to that reported in a study in Lebanon, where the main method for dying by suicide was falling from a height [17]. One possible explanation for this difference is that one of the leading economic activities in Rwanda and neighboring countries is agriculture, where suicide agents such as herbicides and pesticides are commonly used [20, 29, 30]. People tend to choose methods they are familiar with or have witnessed before. In regions with high-raised buildings like Lebanon [31], it is easier to end one's life by falling from a height than in Rwanda. Additionally, the regulation of medications and drugs differs between the two countries, making it potentially easier to obtain such drugs to facilitate a suicide attempt in one country [32]. Another contributing factor might be the level of freedom domestic workers have to leave their residences, which appears to be more lenient in Rwanda compared to Lebanon [17]. Furthermore, the majority of the participants in this study were females who tended to use less violent methods for suicide attempts [33, 34].

Having a chronic medical condition was a common factor associated with all types of suicidal behaviors. This has been a consistently reported risk factor for suicide within other populations [20, 35]. Suicidal behaviors are higher among individuals with chronic physical medical conditions because of the level of progression of the disease, the presence of symptoms of depression, feelings of helplessness, disruptive interpersonal relationships, and uncontrolled pain [35]. For domestic workers, the stress levels brought on by the presence of a chronic physical medical condition are aggravated by job stress, emotional demands, and possible harassment at work [12, 17, 36, 37]. Domestic workers, typically engaged in labor-intensive and emotionally demanding work, face the dual challenge of meeting the demands of their employment while concurrently fulfilling familial obligations that aggravate stress from chronic illnesses [12].

The finding in this study that having more than five dependents was associated with an increased likelihood of suicidal plans and attempts among those with more than five household members at work sheds light on a critical socioeconomic factor influencing mental health within this occupational group. Research from various settings suggests that socioeconomic stressors, including financial strain due to high dependents-to-provider ratios, are indeed linked to mental health challenges and an elevated risk of suicidal behaviors [38]. Among this occupational group, the large household members at work is a serious and sometimes disregarded challenge [12, 39, 40]. Numerous domestic workers in Rwanda and throughout the world are supposed to tend for not just their own needs but also sizable household members at work, such as extended families and large families [12, 40]. Bringing attention to these issues can help start a larger conversation in society about fair labor practices and how important it is to acknowledge the various obligations that domestic workers bear in their personal and work life.

The finding in this study that more years of work experience among domestic workers was associated with an increased likelihood of suicidal ideations is contrary to findings from other studies [41]. More extended work experience is often associated with a more established and stable career, which can, in turn, be linked to better mental health outcomes [41]. However, in the case of domestic workers in Rwanda, this finding suggests a unique dynamic that could be linked to increasing stressors over time, the cumulative impact of emotional labor, or the lack of advancement opportunities within the job description [11]. The demands of their jobs, such as long hours, emotionally draining obligations, and sometimes exploitative working conditions, can cause domestic workers to accumulate stress over time [14–16, 18]. A common feature of domestic work is the absence of obvious career progression opportunities. Years of experience employees gain without the possibility of advancement or professional progress can lead to dissatisfaction and stagnation, further exacerbating feelings of pessimism and despair [42]. Domestic workers may feel socially isolated because their labor is typically done in private houses. Feelings of isolation and loneliness, resulting in little opportunity for social connection

with coworkers, are known to worsen mental health problems [10, 16, 18]. The results highlight the necessity of extensive support networks, mental health resources, and improvements in working conditions within the domestic work sector.

The study found that suicidal ideations were less likely among domestic workers in Rwanda with secondary education as their highest level of education is congruent with studies that suggest higher educational attainment is associated with better adult mental health [43–45]. Individuals with higher academic achievement, even at the secondary level, may have developed a set of problem-solving skills, coping mechanisms, and a level of resilience that could act as protective factors against suicidal ideations [45]. Education can empower individuals to navigate challenges more effectively. Higher educational levels may correlate with increased access to information and financial resources [45]. This access can facilitate a better understanding of mental health issues and the ability to seek appropriate support when needed, potentially reducing the likelihood of suicidal ideation [45].

Still, the same factors mentioned above limit their access to social support and mental health treatment [46]. Domestic workers often work long hours in isolated environments, which can make it difficult to seek out and utilize available mental health resources [47]. Additionally, the stigma associated with mental health issues can prevent domestic workers from seeking help, leading to a cycle of untreated mental health problems and increasing vulnerability to suicidal behaviors. To make matters worse, most domestic workers have low earnings, which makes it difficult for them to access private services, which may be more flexible.

## 4.1 Limitations

A variety of limitations necessitate a cautious interpretation of the study's conclusions. First off, the study did not thoroughly evaluate the many chronic physical illnesses to look at how they specifically affected suicidal behaviors. We recommend future researchers explore this aspect, especially with conditions such as HIV, which are prevalent in the region. Secondly, due to the study's cross-sectional nature, it is impossible to establish causality between the variables. Prospective studies with large sample sizes and potentially with a suitable control group are recommended to determine causality accurately. Additionally, suicide ideation, plan, and attempts were self-reported and assessed using single questions; they are prone to recall biases and poor accuracy. Further studies should aim at using validated tools to improve the accuracy and validity of the results. In this paper, we did not delve into the association between suicidal behaviors and experiences of abuse and violence. This relationship is critical and warrants a thorough analysis. Therefore, we have addressed this aspect in a subsequent paper related to this data. Lastly, we recognize that our paper did not focus on individuals under the age of 18, despite the significant number of minors working as domestic workers in minimally regulated low-income countries, such as Rwanda. We recommend that future researchers focus on this important age group and develop better interventions to mitigate suicidal behaviors among those under 18 years.

## 4.2 Study implications

The present has significant implications for various stakeholders, including policymakers, health professionals, researchers, employers, and families of domestic workers, and they are discussed below.

### 4.2.1 Policymakers

With the high burden of suicidal behaviors among domestic workers, the study findings highlight an apparent urgent need to increase resources to address the mental health and psychological issues of domestic workers. Policymakers have several roles to play, such as empowering the community of domestic workers, which will ease how their challenges are reported, as well as front laws to improve the quality of life of domestic workers and enact supportive policies. Policymakers should still enhance mental health access for domestic workers. This involves making services affordable, reducing stigma, and integrating mental health support into primary care. Outreach programs should also be developed to reach those who lack access. As for FDW [48], laws to protect domestic workers from work-related violence and mistreatment by their employers should all be discussed. In these discussions, domestic workers should be involved to have more applicable policies. Policymakers can also ensure that domestic workers keep accessing educational programs since higher levels of education are protective against suicidal behaviors. Additionally, robust medications and drug monitoring programs to limit deaths by drug overdose should be implemented. Policymakers may also support Mental health outreaches to create awareness of suicidality and proper coping mechanisms among domestic workers.

#### 4.2.2 Healthcare professionals

Healthcare professionals should be aware of the dire need for mental health support in this vulnerable population. They should screen domestic workers for any mental health concerns whenever they visit health facilities for any ailments. For this reason, all healthcare workers should be well-equipped to identify signs of mental illness and refer those with issues such as suicidal ideations to relevant professionals [49, 50]. With this high rate of suicidal behaviors, timely interventions are needed to ensure suicide is prevented. Also, healthcare workers who encounter domestic workers should encourage them to seek and access mental health services. Mental health workers should ensure they have enough expertise in managing suicidal behaviors in this population.

#### 4.2.3 Domestic workers

With more experience being associated with suicidal attempts, all domestic workers who have worked for more than a year should be encouraged to go for mental health assistance when they start feeling unwell [51]. Domestic workers should also ensure that they continue with education despite their engagements. They can actively seek to improve their skills so that they can change professions in the future [52] and not spend all their careers as domestic workers. They should also be trained to recognize mental health signs and seek attention early.

#### 4.2.4 Employers

Since employers are essential in establishing a secure and encouraging work environment, employer-focused awareness programs can draw attention to the symptoms of distress shown by domestic workers and encourage candid dialogue [53]. A workplace culture that values mental health and offers tools for assistance can help lower the likelihood of suicidal thoughts and actions. Employers should be encouraged to create enabling environments for their workers like holidays and hours off duty. This study's findings also show that it is important for families to know the mental health burden this group faces. Family-focused awareness initiatives can lessen the stigma attached to seeking mental health care. Fostering a more supportive home environment can be achieved by offering resources and advice on supporting domestic workers emotionally [54].

#### 4.2.5 Researchers

This study also provides important insights for researchers in the field of mental health. Researchers ought to concentrate on delving deeper into the complex relationship that exists between suicidal ideation, years of working as a domestic worker, and educational attainment. To help guide targeted measures, research into the unique difficulties experienced by female domestic workers and those with chronic medical issues should also be given top priority.

## 5 Conclusions

The present study sheds light on the high prevalence of suicidal behaviors among domestic workers, particularly highlighting vulnerable subgroups within this occupational demographic. The information highlights a higher risk of suicide behaviors in female domestic workers, those with long-term medical conditions, those who have many household members at work, and those with many years of job experience. Notably, a lower risk of suicide behaviors is linked to higher levels of educational attainment. Together, these findings highlight the critical need for focused mental health interventions and support networks in the domestic work sector, recognizing and resolving the difficulties encountered by various labor force sectors. The study's findings offer a significant starting point for the creation of all-encompassing tactics meant to reduce the prevalence of suicidal behaviors among domestic workers and promote a more secure and encouraging work environment for their mental health.

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**Data availability** The datasets will be made available to appropriate academic parties on request from the authors. Email: [kagaba@hdirwanda.org](mailto:kagaba@hdirwanda.org).

## Declarations

**Ethics approval and consent to participate** The present study was conducted per the Declaration of Helsinki 2013. The study was approved by Rwanda Research Ethics Board (Ref: 106/RNEC/2023) and all participants provided consent prior to participation in the study. All of the participants' information were anonymously presented in this study.

**Consent for publication** Not applicable.

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