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Submission

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[Guy-Gérard Aza-Gnandji](#), [Ireti Nethania Elie Ataïgba](#), [Sènan Gratias Koukoubou](#),...

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Evaluation of Suicidal Risk in Sickle Cell Patients Monitored at the Hubert Koutoukou Maga National University Hospital Center in Cotonou in 2022

Guy-Gérard Aza-Gnandji^{1,2}, Ireti Nethania Elie Ataïgba^{3,4}, Sènan Gratias Koukoubou¹, Kokou Messanh Agbémèlé Soedje^{5,6}, Tchedié Etdéchié Elvyre Klikpo^{1,2}, Josiane Ezin Hougbe^{1,2}

¹Département de santé Mentale, Faculté des Sciences de la santé de l'Université d'Abomey-Calavi, Cotonou, Bénin

²Centre National Hospitalier Universitaire Hubert Koutoukou Maga, Cotonou, Bénin

³Faculté de Médecine, Université de Parakou, Parakou, Bénin

⁴Centre Hospitalier Universitaire Départemental du Borgou Alibori, Parakou, Bénin

⁵Département de santé Mentale, Faculté des Sciences de la santé de l'Université de Lomé, Lomé, Togo

⁶Centre Hospitalier Universitaire Sylvanus Olympio de Lomé, Lomé, Togo

Email: gazagnandji@gmail.com, grakoub@gmail.com, elieataigba@gmail.com, soedjem@gmail.com, eklikpo@gmail.com, hougbejosiane@yahoo.fr

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Abstract

Introduction: According to the WHO, suicide is a real public health problem worldwide, and several risk factors have been identified, including pain and chronic illness. **Objective:** The aim of this study was to assess the suicidal risk in sickle-cell patients. **Method:** This was a descriptive and analytical cross-sectional study of sickle-cell patients followed up at the University Clinic of Blood Diseases of Hubert Koutoukou Maga National University Hospital Center from August 2022 to November 2022. The instrument used was the Ducher suicide risk self-assessment scale. **Results:** A total of 65 patients were included. Mean age was 27.04 ± 1.95 years, with extremes of 16 and 50 years, and a peak of 47.69% in the 20 - 30 age group. Women predominated (58.46%), with a sex ratio of 0.71. Somatic complaints accounted for 41.54% of patients' visits, including 21.54% for pain. Suicidal risk was positive in 44.62%, including 13.85% for severe suicidal risk, and 20% attributed their desire to die to pain. The factor associated with positive suicidal risk was single parenthood ($p = 0.02$). Of those with a positive suicidal risk, 46% had shared the intention with close relatives (family and friends), but none had used medical services. **Conclusion:** These data demonstrate the high prevalence of suicidal risk among people with sickle cell disease, and therefore the need for psychosocial intervention in this specific population in Benin.

Keywords

Suicidal Risk, Sickle Cell Disease, Chronic Disease

1. Introduction

According to Health Organization (WHO) estimates for 2019, the suicide rate in Africa was higher than the global average, with an increase of 37% compared with 2000. In Benin, in 2019 the age-standardized suicide rate was 12.7 per 100,000 inhabitants, higher than the global average of 09 per 100,000 [1]. A study conducted from 2013 to 2017 in northern Benin estimated the average suicide mortality rate at 14.9 per 100,000 inhabitants [2].

Among the risk factors for suicidal behavior identified by various studies are pain and chronic illness [2] [3]. Suicidal behavior is reported to be 2 to 3 times higher in people with chronic illnesses than in the general population [4], and all illnesses associated with pain, physical disability, neurodevelopmental disorders and distress increase the risk of suicide [5] [6] [7].

In the WHO African Region, sickle cell disease is recorded in at least 40 countries, with prevalence rates of the βS gene ranging from 2% to 30% [8]. In Benin, one of the most prevalent chronic conditions associated with pain is sickle cell disease, due to the vaso-occlusive crises that constitute its most frequent acute complication. The prevalence of sickle cell trait S is estimated at 20%, and that of hemoglobin C at 10%. Similarly, the percentage of the population carrying SS homozygosity and SC double heterozygosity is estimated at 4.8% [9]. However, in the literature in Africa in general and Benin in particular, data are almost non-existent on suicidal risk among sickle cell patients, who nonetheless constitute a population at risk of suicide. The aim of this study, conducted with a view to filling this gap on the one hand, and contributing to suicide prevention on the other, was to assess the suicidal risk among people with sickle cell disease.

2. Materials and Methods

This was a descriptive and analytical cross-sectional study, conducted by survey of sickle cell patients followed up in the University Clinic for Blood Diseases (CUMAS) of Hubert Koutoukou Maga National University Hospital Center (CNHU-HKM) from August 15 to November 13, 2022.

As the prevalence of suicide in Benin is 12.7 per 100,000 inhabitants [1], and the average number of new sickle cell patients admitted to CUMAS per year is 350 [9], the prevalence of suicide in this specific population is estimated at $350 \times 12.7/100,000$, or 0.044. The sample size N representative of this specific population was calculated using the Schwartz formula, assuming a confidence interval of 95% and a margin of error of 5%.

$$N = (1.96)^2 \times (0.044)(1 - 0.044) / (0.05)^2 = 64.63 .$$

The sample was constituted by census of all sickle cell patients attending consultation or hospitalized, aged at least 16 years and having given their informed consent. Sickle cell patients whose clinical condition did not allow them to participate were not included, particularly patients experiencing a painful crisis.

The variables studied were socio-demographic data, marital status, professional status, reason for consultation, length of follow-up in the department, psychiatric history, universal risk factors associated with suicide and therapeutic recourse.

Data were collected using a questionnaire designed for this purpose and the Ducher Suicide Risk Self-Assessment Scale (aRSD), which was completed in the presence of the physician to overcome difficulties related to incomprehension or language barriers. The aRSD scale was chosen because it assesses the level of someone's decision to act, and its reading is direct, based on the highest score. Its metrological qualities have been demonstrated in several publications, as has its predictive value. A score of 7 or more is considered a major risk for acting out, and one study found a sensitivity of 100% and a specificity of 87%. It appears to be a good tool for self-assessment of suicidal risk in everyday practice, as well as for research protocols [10] [11]. The questionnaire is appended to this article.

Data were entered, processed and analyzed using Epi Info software version 7.2.5.0. Standard statistical measures were used to describe the total population. The χ^2 test was used to compare data. Links between values were considered statistically significant at the 0.05 probability level.

The various administrative authorizations were obtained before the start of the survey. Free and informed consent was also obtained from participants and the parents of minors. Anonymity and confidentiality were respected.

3. Results

A total of 65 patients with sickle cell disease were included.

3.1. General Characteristics

They consist of socio-demographic characteristic shown in **Table 1**. Women predominated at 58.46%, with a sex ratio (M/F) of 0.71. The average age was 27.04 ± 1.95 years, with extremes of 16 and 50 years, and a peak in the 20 - 30 age group represented at 47.69%. Christians peaked at 83.08%, as did singles at 64.62. The majority, 60.94%, came from monogamous families. Pupils and students were the most represented with 32.31%.

3.2. Reason for Consultation

The presence of 58.46% was not motivated by a complaint and was part of their follow-up. For the remainder (41.54%), their presence was motivated by somatic complaints, of which 21.54% were pain-related, *i.e.* half of the latter.

3.3. Previous Medical History

The majority of patients (36.92%) had been under CUMAS care for less than a

Table 1. Distribution according to socio-demographic variables.

	Size (n = 65)	Percent (%)
Sex		
Female	38	58.46
Male	27	41.54
Age group (years)		
[16 - 20]	16	24.62
[20 - 30]	31	47.69
[30 - 40]	14	21.54
[40 - 50]	04	06.15
Religion		
Christian	54	83.08
Muslim	10	15.38
Animist	01	1.54
Marital status		
Single	42	64.62
Married	16	24.62
Cohabitation	06	09.23
Divorced	01	01.54
Family type		
Monogamous	39	60.94
Polygamous	14	21.88
Single parent	11	17.18
Professional status		
Pupil/Student	21	32.31
Trader	20	30.77
Offical	11	16.92
Unemployed	06	09.23
Worker	05	07.70
Others	02	03.07

year. Only one of the 65 patients had previously been under psychiatric care. Of the universal risk factors associated with suicide, alcohol consumption was the most common, accounting for 36.92%, and 87.5% of patients reported occasional consumption.

3.4. Suicidal Risk

The scores obtained on the Ducher suicide risk assessment scale and their inter-

pretations are presented in **Table 2**. According to this scale, 44.62% had a positive suicidal risk score, including 13.85% with a severe suicidal risk corresponding to an active desire to die, or even a defined short- or long-term suicide plan.

3.5. Factors Motivating Suicidal Ideation

Among patients with a positive suicide risk, 44.83% mentioned pain as a factor motivating their suicidal thoughts or desires. **Figure 1** illustrates this.

3.6. Therapeutic Recourses

The different remedies used by patients are broken down in **Figure 2**. 46% of patients with a positive suicidal risk had shared their suicidal ideation or desire, confiding in either a family member (23%) or a close friend (14%), or both (9%). None of them had used a specialized health center on their own initiative, nor had they been referred to one by those to whom they had confided. They said they had received advice and encouragement.

3.7. Factors Associated with Suicidal Risk

In this study, as shown in **Table 3**, only the single-parent family appeared as a

Table 2. Distribution according to suicidal risk and its severity.

aRSD scale score	Severity of suicidal risk	Size (n = 65)	Percent (%)
0	Zero risk	36	55.38
1 - 6	Moderate risk	20	30.77
7 - 10	Severe risk	09	13.85

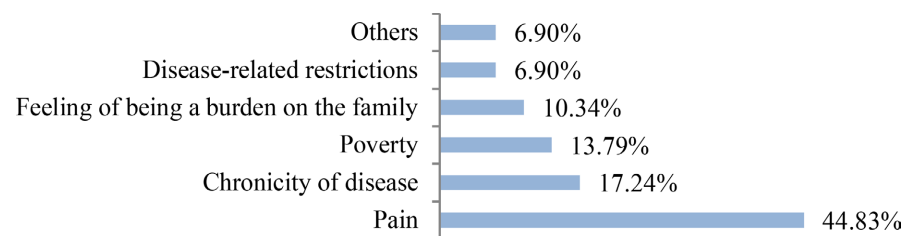


Figure 1. Distribution according to factors motivating suicidal ideation.

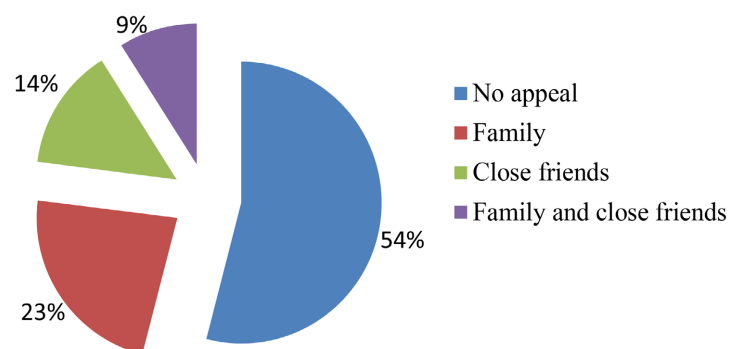


Figure 2. Breakdown according to the request for help.

Table 3. Factors associated with suicidal risk in sickle-cell patients.

	Suicidal risk				
	Yes	No	p-value	OR	IC 95% [OR]
Sex					
Male	09	18	0.12	1	0.79 - 6.17
Female	20	18		2.23	
Age					
16 - 20	06	10	0.90	1	0.39 - 4.71
20 - 30	14	17		1.37	
30 - 40	07	07		1.66	
40 - 50	02	02		1.66	
Ethnic group					
Fon	20	19	0.21	1	0.02 - 1.77
Adja	01	05		0.19	
Yoruba	04	09		0.42	
Bariba	01	00		0.8	
Otamari	02	00		0.83	
Dendi	00	01		0.8	
Yoa	01	02		0.47	
0.03 - 5.67					
Religion					
Christian	24	30	0.63	1	0.32 - 4.82
Muslim	05	05		1.25	
Animist	00	01		1.04	
Marital status					
Single	21	21	0.47	1	0.13 - 1.53
Married	05	11		0.45	
Cohabiting	03	03		1	
Divorced	00	01		0.79	
Family type					
Monogamous	14	25	0.02	1	1.51 - 42.51
Single-parent	09	02		8.03	
Polygamous	06	08		1.33	
Professional status					
Workers	17	21	0.88	1	0.31 - 2.71
Student	09	12		0.92	
Unemployed	03	03		1.23	
0.22 - 6.92					

Continued

Monthly income (USD)				
<65	18	17		1
65 - 163	06	13		0.43 0.13 - 1.4
163 - 245	03	01		2.83 0.26 - 29.95
245 - 327	01	02		0.47 0.03 - 5.69
327 - 408	00	01	0.40	0.55 0.23 - 1.29
490 - 653	00	01		0.55 0.23 - 1.29
653 - 816	00	01		0.55 0.23 - 1.29
>816	01	00		0.61 0.27 - 1.37
Alcohol consumption				
No	17	24		1
Yes	12	12	0.30	1.41 0.51 - 3.88
Tobacco/drug use				
No	28	36		1
Yes	01	00	0.26	1.27 0.23 - 1.96

factor significantly associated with suicidal risk in sickle-cell patients (OR = 8.03, CI95% [1.51 - 42.51]; $p = 0.02$). Gender (OR = 2.23, CI95% [0.79 - 6.17]; $p = 0.12$), ethnic group (OR = 1, $p = 0.21$) and monthly income (OR = 1, $p = 0.40$) were not significantly associated with suicidal risk.

4. Discussion

Our results showed a young population with a mean age of 27 years and extremes of 16 and 50 years, and a high proportion of 20 - 30 year-olds (47.69%). Women predominated (58.46%), with a sex ratio of 0.71. Singles were more represented (64.62%), as were Christians (83.08%), workers (58.46%) and those living in monogamous families (60.94%). Pain was the reason for attending the clinic for 21.54%, and 36.92% had been attending for less than a year. Suicidal risk was positive in 44.62% of patients, 13.85% of whom had a severe suicidal risk. For 44.83%, pain was the main reason for their intention to die. Of those with a positive suicidal risk, 46% had confided their intentions either to a family member or a close friend, but none had sought help in a health center, either on their own initiative or on advice. Only living in a single-parent family was significantly associated with suicidal risk among sickle-cell patients in this study.

4.1. Socio-Demographic Characteristics

The mean age in this study was 27.04 ± 1.95 years. This result is higher than those reported by some authors, who found 24.2 years, 24.75 years and 14 years respectively in their studies [9] [12] [13]. This observed difference could be ex-

plained by the age limit of 16 years in this study unlike theirs where no age limitation was made. The choice of this age limit is explained by the sensitivity of the subject studied and ethical considerations.

The most represented age group was between 20 and 30 (47.69%). Dodo *et al.* had also found the predominance of this age group in their study of sickle cell emergencies at the CNHU-HKM blood disease department [9]. This could be related to the relatively low life expectancy among sickle cell subjects in our context.

The female sex was predominantly represented (58.46%), thus agreeing with the results of Laghaf *et al.* in Mauritania and Dahmani *et al.* in Morocco, who also reported a female predominance [12] [13]. In contrast, Dodo *et al.* found a male predominance of 60.8% (2018) [9]. The female predominance could be explained by the female predominance (51.2%) of the Beninese population [14] and the fact that sickle cell disease is an autosomal recessive genetic disorder.

4.2. Reason for Consultation

Overall, the most frequent reason was systematic follow-up (29.23%), but in terms of functional sign, the most frequent reason was pain (21.54%). Dodo *et al.* also found pain to be the most frequent reason for consultation [9]. This observation could be justified by the fact that vaso-occlusive crisis is the main complication of sickle cell disease [12] [15] [16].

4.3. Suicidal Risk

Based on aRSD scores, 44.62% of sickle cell patients in this study had a positive suicidal risk. Of these, 30.77% were at moderate risk, *i.e.* with thoughts of death or suicide, and 13.85% at severe risk, *i.e.* with an active wish to die, or even a defined short- or long-term suicide plan. We found no studies in the literature concerning suicidal risk in people with sickle cell disease. However, when comparing our results with similar studies on suicidal risk, they are similar to those of Trinanes *et al.* who reported 32.5% for suicidal ideation [17]. Tang *et al.* in their study of suicidal risk in chronic pain and Ducher *et al.* in their study of the descriptive epidemiology of suicidal risk in the French general medical system had respectively reported a suicidal risk of 20% and 24.3%, which are lower values than ours [4] [11]. This difference could be explained by the difference in the study population. In the study carried out by Ducher *et al.*, the study population was represented by primary care consultants, regardless of their previous history, unlike ours, which concerned a specific population made up of people with sickle cell disease.

4.4. Factors Associated with Suicidal Risk

Our analysis showed that only single-parent family type was significantly associated with suicidal risk in sickle-cell subjects ($p = 0.02$; $OR = 8.03$; $IC95\% [1.51 - 42.51]$). The World Health Organization, in its report published in 2014 on

suicide prevention had also noted this factor as increasing suicidal risk [3].

However, we note from our study that pain was an important factor. Indeed, 44.83% of the patients in our study with a positive suicidal risk had mentioned pain as the element justifying their suicidal ideas or desires. Tang *et al.* and Trinanes *et al.* also identified pain as a risk factor [4] [17].

Age, gender and ethnic group were not significantly associated with suicidal risk in our study. This observation is also in line with the World Health Organization's report on suicide prevention [3]. Ducher *et al.* also found no statistically significant association between age and suicidal risk. However, they did find a significant association between gender and suicidal risk; women were more at risk [11].

Religion, marital status, occupational status, alcohol consumption and smoking were not significantly associated with suicidal risk in our study. In contrast, the World Health Organization and Ducher *et al.* found a significant association between marital status, occupational status, alcohol or tobacco consumption and suicidal risk. Indeed, divorce or separation, lack of employment, alcohol or tobacco consumption all increased suicidal risk according to their results [3] [11]. Van Praag, in his study on the role of religion in suicide prevention, concluded that religion was significantly associated with suicidal risk and was a protective factor against suicide [18]. This difference in results between our study and theirs could be explained by the difference in study population and also by the low statistical power associated with our sample size.

4.5. Therapeutic Recourses

46% of patients with a positive suicidal risk had shared their suicidal idea or desire, and had confided in either a family member (23%), a close friend (14%) or both (9%). None of them had used a specialized or non-specialized health center on their own initiative, nor had they been referred to one by the person or persons to whom they had confided. They said they had received advice and encouragement.

These results are in line with those of the World Health Organization, which stipulated that the demand for help in the event of a suicidal crisis remains low, especially as regards recourse to specialized healthcare; populations due to the stigma attached to suicide or the absence of psychological or psychiatric services do not seek help [3].

This study has limitations worth mentioning. As the study took place in a national referral center, the results obtained may not reflect the general population, due to the high frequency of severe cases and the limited number of people attending national referral hospitals. However, given that recruitment was carried out in Cotonou, the country's cosmopolitan main city, these results can be used. Although suicide is a public health issue, it remains a taboo subject in some parts of Africa. Some patients do not readily admit to having suicidal thoughts. This may result in under-reporting or concealment of embarrassing information,

which could have an impact on their score on the suicide risk assessment scale. Socio-cultural and religious beliefs could also reinforce this. The small size of our sample did not allow us to achieve sufficient statistical power. Similarly, as our study was cross-sectional, it had limitations in identifying risk factors; cohort and case-control studies being the most reliable.

Despite these limitations, the results of this work are interesting for the understanding of suicidal risk in our context on several levels.

5. Conclusion

Suicide risk is high among sickle cell patients followed at the CNHU-HKM in Cotonou, and single parenthood is an associated factor. There is little help-seeking and a total absence of recourse to specialized medical services. The results of this study draw our attention to this subject, which is still stigmatized in our context. They show the need for special attention and psychosocial intervention for this specific population, with a view to proper suicide prevention.

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Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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Appendix. Survey Questionnaire

N°	Question	Answer
	Date:
A	Socio-demographic information	
Q1	Age
Q2	Sex	-Male -Female
Q3	Ethnic group
Q4	Nationality
Q5	Religion	-Christian -Muslim -Animist
Q6	Marital status:	-Single -Married -Cohabiting -Divorced -Other
Q7	Family type:	-Monogamous -Single-parent -Polygamous
Q8	Occupational status	-Pupil/Student -Trader -Official -Worker -Unemployed -Others
	Monthly income (USD):
B	Reason for consultation	
Q9	Why did you come for a consultation today?
C	Past history	
Q10	How long have you been treated in this department?	...(days/month/year)
Q11	Have you had any psychiatric treatment in the past?	-Yes -No
D	Universal risk factors	
	Tick the box(es) that apply to you.	
Q12	Are you a victim of discrimination, violence or abuse?	-Yes -No
Q13	Do you feel isolated and/or unsupported?	-Yes -No
Q14	Are you in conflict with the people around you?	-Yes -No

Continued

Q15	Do you drink alcohol?	-Yes -No
Q16	If yes, how often?	-Occasionally -Once a week -Daily -Once a month
Q17	Do you use tobacco or drugs?	-Yes -No
	If yes, how often?	-Occasionally -Once a week -Daily -Once a month

Note: in the section below entitled “Suicide Risk Assessment Scale of Ducker”, please tick in the middle column in front of the items corresponding to your case

E Suicide Risk Assessment Scale of Ducker

Quote the highest level

0	No death ideation	Don't think about death more than usual
1		Thinks about death more than usual
2	Death ideation	Thinks often about death
3		Has a few ideas concerning suicide
4	Suicidal ideation	Often has ideas concerning suicide
5		Very often has ideas concerning suicide and sometimes wishes to exist non more
6	Passive desire to die	Wishes to die or to be dead
7	a: strong link b: weak link	Very strong desire to die but is hold back by something
8	Active will to die	Wants to end in his days
9	a: long-term project b: short-term project	Knows how he wants to end in his days
10	Start of acting out	Has already prepared his suicide or begun to act out

F The various remedies

Q18	Have you ever talked about your thoughts of death or your desire to die?	Yes No
	If so, to whom?
	What has been done?

Note: please complete this questionnaire by ticking or writing the answers that apply to you.