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RECEIVED 04 November 2024

ACCEPTED 07 February 2025

PUBLISHED 06 March 2025

CITATION

Tossou YB, Gbaguidi FNC, Agbo SIE, Zanvo SDE, Codjo-Seignon KLM, Biaka PH, Guedou FA, Kouadio KJ, Anagonou SGE, Mignanwande FZ, Djossou P, Yemadje BV, Houndjrebo FS, Arrawo JdNL, Faihou Y, Johnson H, Sopoh GE, Houezo JG, Kaloga M, Dizoe AS, Nichter M, Juan Jimenez C, Gine-March A and Johnson RC (2025) Factors associated with the management of people affected by disabilities in communities endemic to skin-related neglected tropical diseases in Benin and Côte d'Ivoire. *Front. Trop. Dis.* 6:1522660. doi: 10.3389/ftd.2025.1522660

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Factors associated with the management of people affected by disabilities in communities endemic to skin-related neglected tropical diseases in Benin and Côte d'Ivoire

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Introduction: Healthcare systems and social services in developing countries are often ill-equipped to provide comprehensive care for people with disabilities (PWDs). As a result, the quality of life for PWD frequently deteriorates. Comprehensive health care includes five key components: access to diagnosis, treatment, rehabilitation, psychosocial support, and prevention with follow-up. This study aimed to document those segments of the disabled population and factors most associated with inadequate care in regions of Benin and Côte d'Ivoire endemic to neglected tropical diseases (NTDs).

Methods: An exploratory cross-sectional study of PWD was conducted in 2022 in Benin and Côte d'Ivoire, using a combination of quantitative and qualitative approaches. The sample included 841 PWD, 29 caregivers, and 51 family members. Disability management was evaluated using a scoring system ranging from 0 to 5, classifying management into three categories: good management (scores of 4-5), inadequate management (scores of 1-3), and no management

(score of 0). Quantitative data were analyzed using SPSS version 25.5, with a p-value of <5% considered statistically significant. Open-ended interviews were carried out with a subsample of PWD, family members, and caretakers to provide further insights into what forms of care were and were not being provided.

Results: Among PWD, 98 (11.6%) experienced disability associated with skin-related neglected tropical diseases skin-NTDs [apply throughout]. Of the total, 158 (18.8%) received good management, 532 (63.3%) inadequate management, and 151 (18.0%) no management at all. The median age of the sample was 38 years (22; 52), and the male-to-female sex ratio was 1.45. The key factors associated with the quality of disability management (expressed as odds ratios [OR] with 95% confidence intervals [CI] and p-values) were: age 30 to 44 years (OR 0.29 [0.16–0.54], $p < 0.000$), occupation—saleswoman/housewife (OR 0.32 [0.12–0.81], $p = 0.017$), farmer (OR 0.30 [0.16–0.59], $p = 0.000$), other occupations (OR 0.42 [0.18–0.96]), monthly income over 76 euros (OR 0.41 [0.23–0.74], $p = 0.003$), and cause of disability, specifically skin-NTDs (OR 2.15 [1.13–4.09], $p = 0.000$). The interviews highlighted the need for medical interventions, social and economic support.

Conclusion: Comprehensive and sustainable interventions are needed to improve the well being of people affected by disabilities. These need to be built into public health programs for skin-NTDs.

KEYWORDS

people with disabilities, infectious tropical diseases, management, Benin, Côte d'Ivoire west Africa

1 Introduction

Disability is “any limitation of activity or restriction of participation in society experienced by a person in his or her environment due to a substantial, lasting or permanent impairment of one or more physical, sensory, mental, cognitive or psychic functions, multiple disabilities or a disabling health disorder” (1). According to the World Health Organization (WHO), disability represents a global health, human rights and development challenge (2). Access to health, rehabilitation, and related services is often hampered for PWD (PWDs), particularly children (3). Inadequate management of PWDs leads to difficulties in accessing education, employment, and remuneration, restricting social participation and contributing to poverty (4). In 2022, approximately 240 million children worldwide were disabled, and they were more likely than nondisabled children to have never attended school (5).

The causes of disabilities are diverse. In Africa, and particularly in Benin and Côte d'Ivoire, Skin-NTD are common causes of permanent disability when not diagnosed and treated early (6). Skin-NTDs are a diverse group of conditions caused by a variety of pathogens (including

viruses, bacteria, parasites, fungi and toxins) and associated with skin manifestations such as ulcers, plaques, nodules, wounds, etc. For example, in 2022, Africa reported 20,000 new cases of leprosy, with 6–7% of cases involving irreversible disabilities affecting the eyes, hands, and feet (7). Between 2006 and 2018, 2,785 new cases of Skin-NTD were reported in Benin, with the proportion of new cases involving irreversible disabilities treated in Beninese hospitals ranging between 21.33% and 32% during this period.

A study conducted in Pobè, Benin, between 2005 and 2011 revealed that 66% of Buruli ulcer (BU) cases presented with ulcerative lesions, 36% of which were large (≥ 15 cm). The severity of the condition and delays in treatment likely resulted in permanent functional sequelae for many patients in treatment (7). In 2022, Côte d'Ivoire recorded 500 new cases of leprosy, 25% of which involved disabilities (8). That same year, 251 new cases of BU were reported in Côte d'Ivoire, with 65% of patients presenting severe disabilities (9). Lymphatic filariasis (LF), another disabling Skin-NTD, was endemic in 77 districts of Benin in 2023, while 93 districts in Côte d'Ivoire were suspected to be endemic that same year (10).

Early, comprehensive, and high-quality management is crucial for managing disabilities and reducing associated social stigma (11). Unfortunately, despite efforts by the governments of both countries, care management remains insufficient in both quality and quantity. This study aimed to identify segments of the disabled population and factors associated with inadequate disability management in

Abbreviations: BU, Buruli ulcer; CP, Cerebral Palsy; IGA, Income-Generating Activity; LF, Lymphatic Filariasis; LMICs, Low-and Middle-Income Countries; NGO, Nongovernmental Organization; Skin-NTD, Skin neglected tropical diseases; NTDs, Neglected Tropical Diseases; PWDs, People with Disabilities; WHO, World Health Organization.

communities endemic to neglected tropical diseases with cutaneous manifestations (Skin-NTD) in Benin and Côte d'Ivoire. Special attention was given to this segment of the PWD population.

2 Study framework and methods

2.1 Study setting

Data were collected from the localities of Ouidah, Lalo, Allada and Pobè in Benin (Figure 1_Benin), and from Divo, Yamoussoukro and Tiassalé in Cote d'Ivoire (Figure 2_Cote d'Ivoire). These localities were selected because they are endemic to Skin-NTD, and most of them have specialized centers dedicated to treatment. The main language spoken in these areas is Fon, and the religions present are Christian, Muslim and traditional. Wealth varies from place to place. Ouidah and Allada are the most developed towns. In Côte d'Ivoire, the main languages spoken in these areas are Baoulé, Bété and Dida, and as in Benin, different religions coexist and wealth varies from town to town. Of the three, Yamoussoukro is the most developed.

2.2 Study design

This was a descriptive cross-sectional study with an analytical focus, using a mixed-method approach, which took place from September 2022 to October 2023, in Benin and Côte d'Ivoire.

A preparatory phase preceded data collection in Benin and Côte d'Ivoire, during which data collection tools were developed and validated, and interviewers were recruited and trained.

2.3 Target populations and selection criteria

2.3.1 Target populations

This study targeted communities in which PWD due to Skin-NTD resided. All PWD in these communities were surveyed regardless of the cause of their disability. A subsample of family members and caretakers were also interviewed.

2.3.2 Selection of participants

2.3.2.1 PWD

2.3.2.1.1 Sample size justification

The sample size of 841 people with disabilities was determined based on the Schwartz formula to ensure sufficient statistical power to detect meaningful differences in disability management across the study sites.

In the study literature, we have few recent studies on disability related to neglected tropical diseases. We have therefore used a prevalence estimate of 0.5. The application of Schwartz's formula in this study is as follows:

$$n = (Z\alpha^2pq)/i^2$$

n = sample size; i = 5% (desired precision); p = 50%; q = 1- p =50%; $Z\alpha$ = 1.96 (value of reduced deviation at risk α equal to 5%); Hence n = 384.

The minimum size obtained will be 384. This number will be increased by 5%, giving 403 people with disabilities to include in the study in each target country. In both countries, the size will be 806 people with disabilities. In both countries, the size will be 806 people with disabilities.

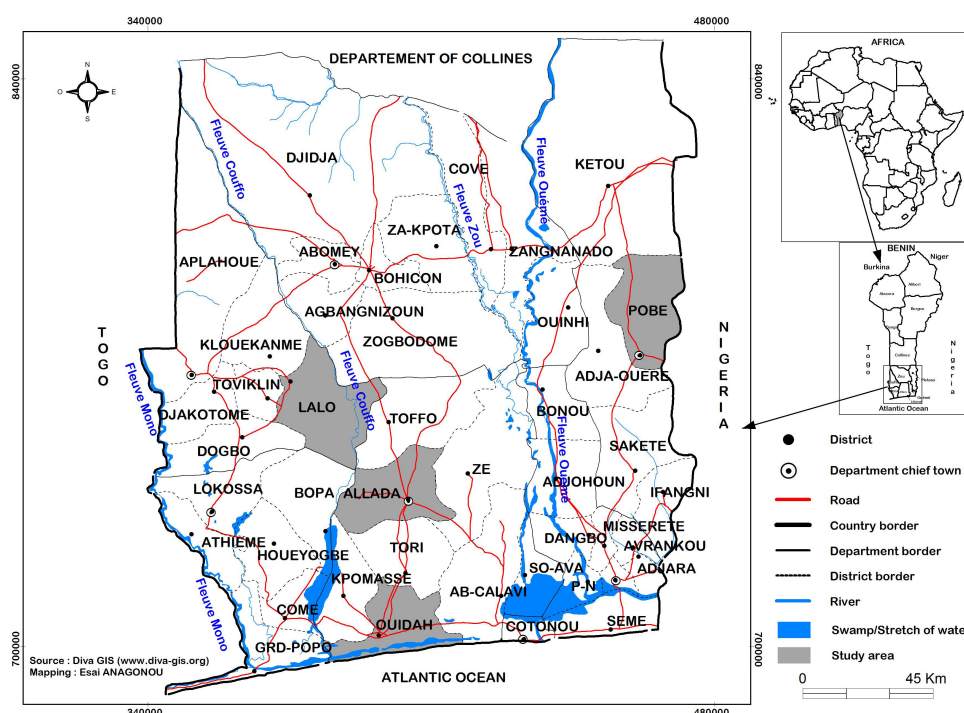


FIGURE 1
Map showing study sites in Benin.

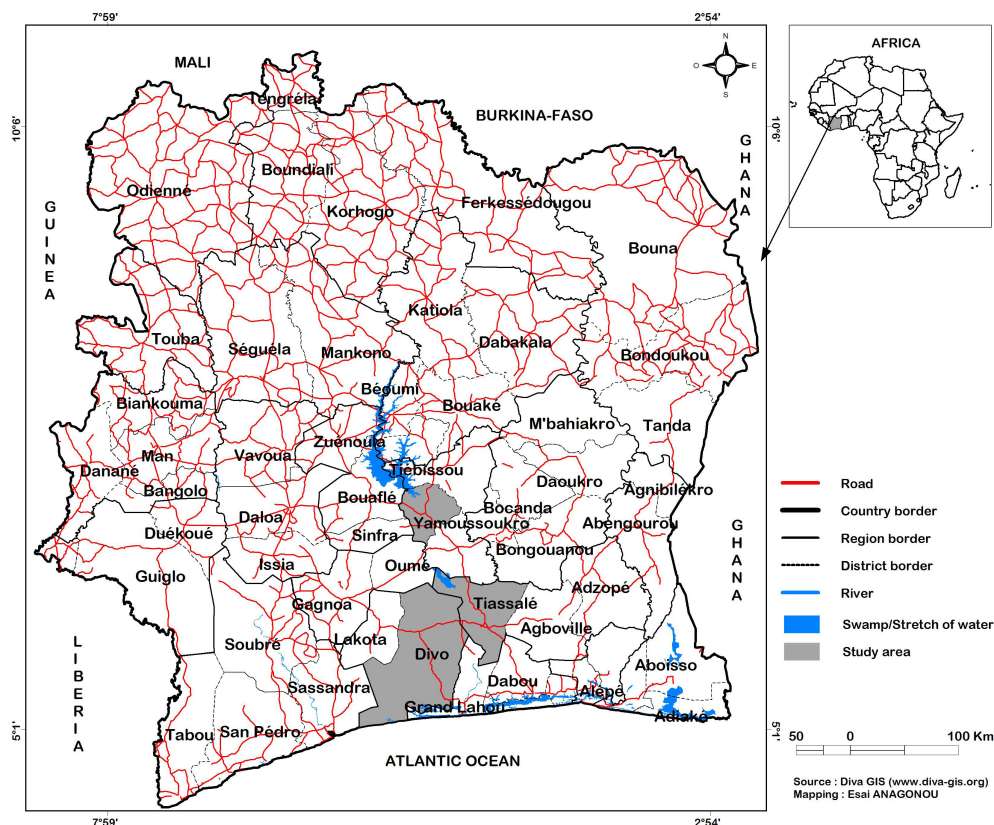


FIGURE 2
Map showing study sites in Côte d'Ivoire.

2.3.2.1.2 Selection of PWD

The patient registers of specialized centers dedicated to Skin-NTD treatment were reviewed. All individuals with disabilities due to Skin-NTD who had been treated in these centers over the past five years were listed, and their localities of origin were carefully documented. The research team then traveled to the recorded villages to locate and interview these individuals and all other individuals with disabilities residing in and around the target localities. A total of 841 PWD were included in the study, 418 from Benin and 421 from Côte d'Ivoire.

Based on the list of people with disabilities received from the health centers, the interviewers went out to the corresponding localities to look for them. Once the information had been collected from these people, a snowball method was used to find the disabled people present in these areas but not present on the starting site.

2.3.2.2 Community members and caregivers

Thirty-five family members in Benin and 16 family members in Côte d'Ivoire were also interviewed. Additionally, 18 healthcare providers in Benin and 11 in Côte d'Ivoire were interviewed including social workers, nurses, doctors, and physiotherapists.

As for family members, those available and willing to take part in the survey were included. As for health professionals, those available and present at the time of the survey were interviewed.

2.4 Variables

Management of PWD is a composite variable. This composite variable is based on the patient's access to five different services, whose absence is rated 0 and access is rated 1. These five services are access to diagnosis, treatment, rehabilitation, psychosocial support, and prevention and follow-up. When all these five services are available and the patient has access to them, the sum of the total score is 5 (Table 1).

The following are the specific services queried:

- Diagnosis: whether or not for the PWD health has been diagnosed by a professional.
- Treatment: access or not to treatment (in case of disease) for PWD.
- Rehabilitation: whether or not for the PWD is followed by a healthcare professional whose aim is to restore the disabled person to a more normal lifestyle.
- Psychosocial support: whether or not the individual is followed up by a psychologist.
- Prevention and follow-up: whether or not the individual is followed up by a healthcare professional (such as a physiotherapist, to prevent possible complications).

The other variables assessed in the study were:

TABLE 1 Levels of disability management.

	Scores
Management	
Access to diagnosis	0 or 1
Treatment	0 or 1
Rehabilitation	0 or 1
Psychosocial support	0 or 1
Prevention and follow-up	0 or 1
Categories	
No	0
Insufficient	1-3
Good	4-5

In our study, this variable is designed as a composite variable calculated based on the patient's access to 5 different services, with lack of access scored as 0 and access scored as 1.

- Sociodemographic and socioeconomic factors: age, sex, level of education, marital status, occupation, monthly income, and income-generating activity (IGA).
- Clinical factors: type and cause of disability.
- Health system-related factors: availability of health services and organization of the health system.

2.5 Data collection tools

Data were collected through structured questionnaires and interview guides administered to participants with disabilities, their family members/caregivers, and healthcare providers. The questionnaires and interview guides included questions on socio-demographic characteristics, disability type, access to healthcare services (diagnosis, treatment, rehabilitation, psychosocial support, prevention/follow-up), and perceived barriers to accessing these services.

A detailed observation grid was developed to assess interactions between people with disabilities and their community members, focusing on focus on their daily lifestyle and how they interact with their environment to accomplish daily tasks.

A grid for observing interactions between PWD and their community was also employed to assess these people in their social context (Example: washing, shampooing, eating meals, moving around outdoors). To capture the experiences and interrelations of PWD with their families and communities, the interviewers spent 24– to 48 hours with the individuals selected for this in-depth study (Observation grid and Interview guide details are presented in [Supplementary Material](#)).

2.6 Data processing and analysis

Quantitative data from the 841 PWD were collected using the KoboCollect digital tool, exported to Excel, and then checked for completeness and accuracy. Data analysis was performed using

the Statistical Package for Social Science (SPSS version 25). Quantitative variables are expressed as the means with standard deviations, whereas qualitative variables were summarized as frequencies. Means were compared with the Student's t-test, and frequencies were compared with Pearson's chi2 test or Fisher's exact test, as appropriate. Variables with a p-value of less than 20% in the bivariate analysis were retained for multivariable analysis to account for potential confounders and to ensure a comprehensive exploration of factors associated with inadequate disability management. The multivariable analysis was conducted using a stepwise iterative logistic regression model (Wald top-down). This multivariable analysis was performed for all PWDs and then stratified according to gender. For all comparisons, the difference was considered significant for p values less than 5%. At the end of the variable selection procedure in the final model, the adequacy of the model was verified using the Hosmer and Lemeshow test. Finally, the results are presented in the form of text and tables.

For the qualitative data, the interview recordings were fully transcribed in French and coded. This allowed for a comprehensive, interpretative description of the interviewees' discourse, using a method that ensured the information was preserved "in legible terms" (12). The data input process facilitated categorization, cross-referencing, and thematic synthesis. On the basis of the triangulation of the different points of view emerging from the interviews, the data analysis was structured around the main lines retained after analysis of the verbatim content.

2.7 Ethical aspects

The study was approved by the research ethics committee of the University of Parakou (CLERB-UP) in Benin under authorization N°0492/CLERB-UP/P/SP/R/SA of 19/11/2021 and by the National Life and Health Sciences Ethics Committee (CNESVS) of Côte d'Ivoire under authorization N/Réf: 076-22/MSHPCMU/CNESVS-kp of 28/07/2022. Written informed consent was obtained from all participants, with an emphasis on the voluntary nature of participation. It was made clear that there would be no consequences for those who chose not to participate.

3 Results

3.1 Sociodemographic and socioeconomic characteristics of PWD

The distribution of disabled people according to the different variables is summarized in [Table 2](#).

- Median age: The median age of study participants (Q1; Q3) was 38 (22; 52) years, ranging from 1– to 115 years. In Benin, the ages ranged from 1.5– to 90 years, with a median age (Q1; Q3) of 35 (20; 52). In Côte d'Ivoire, the ages ranged from 1– to 115, with a median age (Q1; Q3) of 40 (26; 54) years.

- Among PWD, 497 (59.1%) were men and 344 (40.9%) were women (sex ratio=1.45). In Benin, 244 (58.4%) men and 174

TABLE 2 Distribution of PWD linked to Skin-NTD according to sociodemographic and economic variables in Benin and Côte d'Ivoire (n = 841).

Variables	Benin, n (%)	Ivory Coast, n (%)	Total, n (%)
Age	418	423	841
0–14	63 (15.1)	45 (10.6)	108 (12.8)
15–29	112 (26.8)	81 (19.1)	193 (22.9)
30–44	89 (21.3)	120 (28.4)	209 (24.9)
45–59	96 (23)	105 (24.8)	201 (23.9)
60–74	47 (11.2)	46 (10.9)	93 (11.1)
≥ 75	11 (2.6)	26 (6.1)	37 (4.4)
Sex	418	423	841
Female	174 (41.6)	170 (40.2)	344 (40.9)
Male	244 (58.4)	253 (59.8)	497 (59.1)
Schooling	418	423	841
Yes	94 (22.5)	201 (47.5)	295 (35.1)
No	324 (77.5)	222 (52.5)	546 (64.9)
Education level	411	417	828
No level	317 (77.1)	216 (51.8)	533 (64.4)
Primary	51 (12.4)	107 (25.7)	158 (19.1)
Secondary	39 (9.5)	72 (17.2)	111 (13.4)
University	4 (1)	22 (5.3)	26 (3.1)
Marital status	355	378	733
Single	119 (33.5)	142 (37.6)	261 (35.6)
Married/Couple	147 (41.4)	173 (45.8)	320 (43.7)
Divorced/Separated	46 (13)	20 (5.2)	66 (9)
Widowed	43 (12.1)	43 (11.4)	86 (11.7)
Profession	355	378	733
Civil servant	4 (1.1)	13 (3.4)	17 (2.3)
Craftsman/Worker	49 (13.8)	28 (7.4)	77 (10.5)
Shopkeeper/Housekeeper	2 (0.6)	24 (6.3)	26 (3.5)
Cultivator	4 (1.1)	43 (11.4)	47 (6.4)
Other	10 (2.8)	21 (5.6)	31 (4.2)
No profession	286 (80.6)	249 (65.9)	535 (73.1)
Income-generating activity	355	378	733
Yes	106 (29.9)	109 (28.8)	215 (29.3)
No	249 (70.1)	269 (71.2)	518 (70.7)
Monthly income	355	378	733
0–50,000	337 (94.9)	317 (83.9)	654 (89.2)
50,000–100,000	11 (3.1)	40 (10.6)	51 (7)
≥ 100,000	7 (2)	21 (5.6)	28 (3.8)

PWD, person with disability.

(41.6%) women (sex ratio=1.40) were included, while in Côte d'Ivoire, 253 (59.8%) men and 170 (40.2%) women (sex ratio=1.48) were included.

- **Education:** We have only taken into account individuals aged 5 years and over (school starting age). Of the 828 subjects meeting this criterion, 295 (35.6%) had attended school: 158 (18.0%) at the primary level, 111 (03.4%) at the secondary level and 26 (03.1%) at the tertiary level. The remaining 533 or 64.4% had not attended school (311 (62.2%) men and 104 (61.2%) women). In Benin, 324 (77.5%) PWD had not attended school. Of these, 193 (79.1%) were men and 131 (75.3%) were women. In Côte d'Ivoire, 222 (52.5%) had not attended school, including 118 (46.6%) men and 104 (61.2%) women.

- **Marital status:** Marital status was assessed among 733 eligible subjects (aged 15 years and older). In this group, married individuals accounted for 43.7%, followed by single individuals at 35.6%. In Benin, 147 (41.4%) participants were married, comprising 89 (44.1%) men and 58 (37.9%) women. In Côte d'Ivoire, 173 (45.8%) participants were married, including 125 (54.3%) men and 48 (32.4%) women.

- **Occupation:** With respect to occupation, 535 (73.1%) of the sample reported having no occupation, and 198 (27.0%) an occupation. Among those with an occupation, 77 (38.9%) were craftsmen/workers, 47 (23.7%) were farmers/peasants, and 17 (08.6%) were civil servants. In Benin, 286 (80.6%) had no profession including 149 (73.8%) men and 137 (89.5%) women). In Côte d'Ivoire, 249 (65.9%) had no profession consisting of 123 (53.5%) men and 126 (85.1%) women).

- **Income-generating activities:** Among the PWD, 215 (29.3%) had income-generating activity (IGA). In Benin, 106 (29.9%) had an IGA (41 (20.3%) men and 65 (42.5%) women). In Côte d'Ivoire, 109 (28.8%) had an IGA (62 (27.0%) men and 47 (31.8%) women).

- **Monthly income:** Monthly income varied between €0 and €762. Among the respondents, 654 (89.2%) reported a monthly income of less than €76. In Benin, 337 respondents (94.9%) had an income below €76, which is the minimum wage. Of these, 189 (93.6%) were men and 148 (96.7%) were women. In Côte d'Ivoire, the proportion of individuals earning less than €76 was 317 (83.9%), consisting of 173 men (75.2%) and 144 women (97.3%), with a minimum wage of €114.

3.2 Disability management and clinical features

- Among the 841 individuals with disabilities included in this study, 151 (18%) reported having no management services at all, with variations between the two countries: 23.2% in Benin and 12.8% in Côte d'Ivoire. In Benin, 97 individuals (23.2%) received no management-related services from healthcare providers, while 237 (56.7%) had insufficient management, and 84 (20.1%) received good management. In Côte d'Ivoire, 54 individuals (12.8%) reported no management services, 295 (69.7%) had insufficient management, and 74 (17.5%) received good management.

- In terms of the type of disability, 772 (91.8%) experienced a single disability, the remaining 69 (8.2%) had multiple disabilities. Among those with a single disability, 554 patients (65.8%) had a motor disability. Isolated sensory disabilities (visual, auditory, olfactory, and tactile) were reported by 173 individuals (20.6%), and isolated cerebral palsy (CP) was found in 45 individuals (5.4%) of the surveyed population. In Benin, 393 individuals with disabilities (94.0%) had a single disability, comprising 230 men (94.3%) and 163 women (93.7%). Conversely, 25 individuals (6.0%) had multiple disabilities, including 14 men (5.7%) and 11 women (6.3%). In Côte d'Ivoire, 379 individuals (90.0%) had a single disability, with 229 men (90.5%) and 150 women (88.2%). A total of 44 individuals (10.4%) were multi-disabled, consisting of 24 men (9.5%) and 20 women (11.8%).
- Of the entire population of PWD identified in study locales, 98 individuals (11.7%) were disabled as a result of NTDs. In Benin, this included 49 men (11.7%) and 23 women (13.2%). In Côte d'Ivoire, the proportion was similar, with 49 individuals (11.6%), comprising 30 men (11.9%) and 19 women (11.2%) (Table 3).

3.3 Family members and caregivers

- Among the 51 family members interviewed, 38 (74.5%) were aged between 30 and 59 years. This population comprised 25 men (49.0%) and 26 women (51.0%), with a sex ratio of 1. In terms of educational level, 25 (49.0%) had

attended school, of whom 12 (23.5%) had a primary education, 12 (23.5%) had a secondary education, and 1 (2.0%) had a higher education. The remaining 26 (51.0%) had no schooling. In terms of marital status, married people predominated, accounting for 37 (72.5%) of the total cohort.

- Among the 29 caregivers interviewed, 22 (75.9%) were aged between 30 and 59 years. Among this population, 14 (48.3%) were men and 15 (51.7%) were women, with a sex ratio of 0.9. Almost all 22 individuals (93.1%) had a university-level education. Married people predominated at 19 (65.5%). In terms of professions, 3 (10.3%) were doctors, 7 (24.1%) nurses and midwives, 4 (13.8%) physiotherapists, 5 (17.2%) social workers, and 3 (10.3%) traditional therapists and others (religious leaders and management assistants) (Table 4).

3.4 Factors associated with disability management

- In the univariate analysis (Table 5), variables such as age, marital status, occupation, income, type of disability, and causes of disability were significantly associated with disability management in our study. When stratified by sex, only variables such as the IGA and level of education were significantly associated with inadequate disability management.

A significant association was found between age and monthly income for both sexes. The risk of insufficient management decreases as age increases, except for women aged 75 and above (Table 6).

In men, significant associations were observed with marital status ($p = 0.000$), profession ($p = 0.000$), and type of disability ($p = 0.005$) in men. Being single, not having a profession, and having multiple disabilities increased the risk of receiving inadequate treatment (Table 6).

A significant association was also found between level of education ($p = 0.047$) and IGAs in women. Having some education and engaging in IGAs reduced the risk of experiencing insufficient management (Table 6).

- Multivariable analysis: multivariable analysis revealed four factors that were significantly associated with disability management: age ($p=0.000$), occupation ($p=0.001$), income ($p=0.003$), and causes of disability ($p=0.000$). These results are presented in Table 7.
- The factors ultimately associated with inadequate management by sex were as follows (Tables 8, 9):
 - for men, young age, a monthly income of less than 76 euros and not exercising a profession;
 - for women, not practicing an IGA and causes of disability due to NTDs.

TABLE 3 Distribution of PWD linked to Skin-NTD according to clinical variables in Benin and Côte d'Ivoire ($n = 841$).

Variables	Benin, n (%) n = 418	Ivory Coast, n (%) n = 423	Total, n (%) n = 841
Disability management			
Good	84 (20.1)	74 (17.5)	158 (18.8)
Insufficient	334 (79.9)	349 (82.5)	683 (81.2)
Type of disability			
Motor	262 (62.7)	292 (69.1)	554 (65.8)
Sensory	95 (22.7)	78 (18.4)	173 (20.6)
Cerebral palsy	36 (8.6)	9 (2.1)	45 (5.4)
Multiple disabilities	25 (6)	44 (10.4)	69 (8.2)
Causes of disability			
Skin-NTD	49 (11.7)	49 (11.6)	98 (11.7)
Others causes	369 (88.3)	247 (58.4)	616 (73.2)
Unknown	0 (0)	127 (30)	127 (15.1)

PWD, person with disability; Skin-NTD, Skin neglected tropical diseases.

TABLE 4 Distribution of families and caregivers according to sociodemographic variables in Benin and Côte d'Ivoire.

Variables	Benin, n (%)	Ivory Coast, n (%)	Total, n (%)
Family circle*	35	16	51
Age			
15–29	1 (2.9)	2 (12.5)	3 (5.9)
30–44	12 (34.3)	3 (18.7)	15 (29.4)
45–59	17 (48.6)	6 (37.5)	23 (45.1)
60–74	5 (14.2)	5 (31.3)	10 (19.6)
≥ 75	0 (0)	0 (0)	0 (0)
Sex			
Female	19 (54.3)	7 (43.7)	26 (51)
Male	16 (45.7)	9 (56.3)	25 (49)
Schooling			
Yes	18 (51.4)	7 (43.7)	25 (49)
No	17 (48.6)	9 (56.3)	26 (51)
Level of education			
No level	17 (48.6)	9 (56.3)	26 (51)
Primary	8 (22.9)	4 (25)	12 (23.5)
Secondary	9 (25.6)	3 (18.7)	12 (23.5)
University	1 (2.9)	0 (0)	1 (2)
Marital status			
Single	2 (5.7)	3 (18.7)	5 (9.8)
Married/Couple	25 (71.4)	12 (75.0)	37 (72.5)
Divorced/Separated	3 (8.6)	0 (0)	3 (5.9)
Widowed	5 (14.3)	1 (6.3)	6 (11.8)
Religion			
No	2 (5.7)	4 (25)	6 (11.8)
Ancestral	11 (31.4)	3 (18.7)	14 (27.4)
Christian	22 (62.9)	8 (50)	30 (58.8)
Muslim	0 (0)	1 (6.3)	1 (2)
Care staff**	18	11	29
Age			
15–29	5 (27.8)	0 (0)	5 (17.2)
30–44	7 (38.9)	5 (45.4)	12 (41.4)
45–59	5 (27.8)	5 (45.4)	10 (34.5)
60–74	0 (0)	1 (9.1)	1 (3.4)
≥ 75	1 (5.5)	0 (0)	1 (3.4)
Sex			
Female	10 (55.6)	5 (45.4)	15 (51.7)

(Continued)

TABLE 4 Continued

Variables	Benin, n (%)	Ivory Coast, n (%)	Total, n (%)
Sex			
Male	8 (44.4)	6 (54.5)	14 (48.3)
Schooling			
Yes	17 (94.5)	10 (90.9)	27 (93.1)
No	1 (5.5)	1 (9.1)	2 (6.9)
Education level			
No level	1 (5.5)	1 (9.1)	2 (6.9)
Primary	1 (5.5)	1 (9.1)	2 (6.9)
Secondary	2 (11.1)	1 (9.1)	3 (10.3)
University	14 (77.8)	8 (72.7)	22 (75.9)
Marital status			
Single	7 (38.9)	2 (18.2)	9 (31)
Married/Couple	11 (61.1)	8 (72.7)	19 (65.5)
Divorced/Separated	0 (0)	1 (9.1)	1 (3.4)
Widowed	0 (0)	0 (0)	0 (0)
Profession			
Doctor	3 (16.7)	0 (0)	3 (10.3)
Nurse/Midwife	2 (11.1)	5 (45.4)	7 (24.1)
Physiotherapist	2 (11.1)	2 (18.2)	4 (13.8)
Social assistant	4 (22.2)	1 (9.1)	5 (17.2)
Traditional healer	2 (11.1)	1 (9.1)	3 (10.3)
Other***	5 (27.8)	2 (18.2)	7 (24.1)

*p-value: calculated using Chi-square test; OR, Odds ratio; CI, Confident interval; IGA, income generating activity.

**These are relatives of PWDs: parents, other family members with whom they interact in one way or another on a daily basis (husband, wife, child, father, mother, brother, sister, cousin, etc.) or guardians.

***These are social workers, disability educators, adaptive physical activity teachers, occupational therapists, nurses, physiotherapists, doctors (physical medicine and rehabilitation), psychologists, psychometricians, traditional healers and masseurs involved in the prevention or management of disability. These stakeholders provide formal assistance to PWDs, as opposed to family or extrafamilial contacts, who usually fall into the category of informal help.

***Religious leaders and caregivers.

- For men, the analysis revealed the following: age 30– to 44 years (OR=0.26 [95% CI=0.11–0.60]), age 45– to 59 years (OR=0.25 [95% CI=0.11–0.58]), age 75 years (OR=0.21 [95% CI=0.05–0.82]), monthly income greater than 76 euros (OR=0.47 [95% CI=0.25–0.89]) and occupation as farmer (OR=0.25 [95% CI=0.11–1.16]). For women, results were obtained for IGA (OR=3.04 [95% CI=1.64–5.61]) and NTD-related causes of disability (OR=12.61 [95% CI=1.67–95.31]).
- In others to explore the differences between both sexes regarding disability management and its associations with all variables (socio-demographic and socio-economic), an analysis was conducted, represented in [Table 5](#).

TABLE 5 Breakdown of sociodemographic to clinical variables in relation to inadequate management of disability.

Variables	Good management	Insufficient management	OR [95% CI]	P*
	n (%)	n (%)		
Age	158	683		0.000
0–14	3 (2.8)	105 (97.2)	1 [1]	
15–29	17 (8.8)	176 (91.2)	0.30 [0.36–1.03]	
30–44	55 (26.3)	154 (73.7)	0.08 [0.16–0.51]	
45–59	60 (29.9)	141 (70.1)	0.07 [0.12–0.42]	
60–74	17 (18.3)	76 (81.7)	0.13 [0.34–1.20]	
≥ 75	6 (16.2)	31 (83.8)	0.15 [0.41–2.08]	
Sex	158	683		0.234
Male	100 (20.1)	397 (79.9)	1 [1]	
Female	58 (16.9)	286 (83.1)	1.24 [0.87–1.78]	
Marital status	155	578		0.000
Married/Couple	93 (29.1)	227 (70.9)	1 [1]	
Divorced/Separated	16 (24.2)	50 (75.8)	1.28 [0.69–2.36]	
Widowed	13 (15.1)	73 (84.9)	2.30 [1.21–4.35]	
Single	33 (12.6)	228 (87.4)	2.83 [1.83–4.38]	
Education level	158	683		0.106
No level	94 (17.6)	439 (82.4)	1 [1]	
Primary	29 (18.4)	129 (81.6)	0.95 [0.60–1.50]	
Secondary/University	35 (25.5)	102 (74.5)	0.62 [0.40–0.97]	
Profession	155	578		0.000
No profession	89 (16.6)	446 (83.4)	1 [1]	
Civil servant	5 (29.4)	12 (70.6)	0.48 [0.16–1.39]	
Craftsman/Worker	18 (23.4)	59 (76.6)	0.65 [0.36–1.16]	
Shopkeeper/Housekeeper	9 (34.6)	17 (65.4)	0.38 [0.16–0.87]	
Cultivator	23 (48.9)	24 (51.1)	0.21 [0.11–0.38]	
Others	11 (35.5)	20 (64.5)	0.36 [0.16–0.78]	
Income-generating activity				0.090
Yes	54 (25.1)	161 (74.9)	1 [1]	
No	101 (19.5)	417 (80.5)	1.38 [0.95–2.02]	
Monthly income				0.000
0–50,000	123 (18.8)	531 (81.2)	1 [1]	
≥ 50,000	32 (40.5)	47 (59.5)	0.34 [0.21–0.55]	
Type of disability				0.005
Motor	120 (21.7)	434 (78.3)	1 [1]	
Sensory	29 (16.8)	144 (83.2)	1.37 [0.87–2.15]	
Cerebral palsy	2 (4.4)	43 (95.6)	5.94 [1.42–24.89]	
Multiple disabilities	7 (10.1)	62 (89.9)	2.45 [1.09–5.49]	
Disability causes				0.017

(Continued)

TABLE 5 Continued

Variables	Good management	Insufficient management	OR [95% CI]	P*
	n (%)	n (%)		
Others causes	127 (20.6)	489 (79.4)	1 [1]	
Skin-NTD	14 (14.3)	84 (85.7)	0.78 [0.44–1.38]	
Unknown	17 (13.4)	110 (86.6)	0.42 [0.22–0.78]	

*p-value, calculated using Chi-square test; OR, Odds ratio; CI, Confident interval; IGA, income generating activity; Skin-NTD, Skin neglected tropical diseases. Values in bold in the table are below the p-value set at 0.005.

- When stratified by sex, only variables such as the IGA and level of education were significantly associated with insufficient disability management.

A significant association was found between age and monthly income for both sexes. The risk of insufficient management decreases as age increases, except for women aged 75 and above. In the case of low incomes, the vulnerability to insufficient treatment increases.

In men, significant associations were observed with marital status ($p = 0.000$), profession ($p = 0.000$), and type of disability ($p = 0.005$) in men. Being single, not having a profession, and having multiple disabilities increased the risk of receiving inadequate treatment.

A significant association was also found between level of education ($p = 0.047$) and IGAs in women. Having some education and engaging in IGAs reduced the risk of experiencing insufficient management.

3.5 Problems encountered by PWD

In all of the interviews with PWD, the causes of their disabilities were shown to have profound economic, emotional, and social consequences. The deep interconnection of these factors highlights the need for not only medical interventions, but also social and economic support.

Data from in-depth interviews with a subsample of PWD affected by NTD illustrate how unemployment, lack of income, stigma, and isolation are interrelated and severely impact their lives. The narrative of Mrs. “AM” illustrates these challenges.

“I am disabled as a result of BU contracted at the age of 8 years. That is when Dr. Annick from the Tatonnoukon Health Center examined me and sent me to the Pobè leprosy and BU screening and treatment center. In my family, all I had was my mother’s support. Today, I have the support of my husband alone. I have lost three of my children due to lack of resources. What I’m most happy about today is that Dr. Annick enrolled me in school and put me through training. Then, I bought a sewing machine. My wish is that God will give me good health so that I can go about my business and open a store. I do not like stories, for fear of being insulted because of my handicap. I tell myself that by God’s grace, I will be able to join the community one day; only I will not be open to anyone. I also tell myself that others live worse lives than I do, so I keep hoping because tomorrow will be better.” (Mrs AM, 29, seamstress, Bonou-Benin).

Interviews like this highlighted a need for comprehensive interventions to help PWD regain a sense of self-worth and build meaningful social relationships.

3.6 Specific obstacles to care for PWD

3.6.1 Cultural perceptions of disabilities

Access to care is hindered by several obstacles, including the belief in the supernatural origin of disabilities, and a lack of knowledge about available disability management resources. In some cases, such as that of this 36-year-old man from Benin, disability is perceived to be a curse or the result of witchcraft. Notably, this belief has limited his pursuit of appropriate health care resources.

He explains:

“In my village, we do not know anything about the possibility of managing my disability in a health center. In addition, for me, this is a definitive situation, especially as it was not a natural illness. According to my understanding, the illness that led to my disability was considered to be a curse, the result of witchcraft, often referred to as “ayigbanou” disease (.....). For me, nothing is possible anymore. I was treated free of charge at the Lalo screening and treatment center (CDT) But now, where am I going to find the money to pay for additional treatment given my situation?” (Mr. DJ, 36, Tire repairer, Lalo-Benin).

This double barrier of the perceived supernatural origin of disability and financial constraints creates a vicious cycle that compromises access to disability management resources for PWD exacerbating their vulnerability.

3.6.2 Economic obstacles

In the context of caring for PWD, it is imperative to consider the profound impact of social and economic determinants on their well-being.

Unfortunately, the precarious socioeconomic conditions in which many PWD live exacerbate the complex challenges they face. One mother shared her experience with her daughter, who became disabled at the age of 13 years:

“After our daughter’s accidental fall, we underwent several types of treatment. She was first treated in the hospital, and as her

TABLE 6 Study of the associations between management and sex and a number of demographics, economic and medico-social characteristics among PWD (whether or not related to NTDs) in Benin and the Ivory Coast.

Characteristics	Male (n = 497)				Female (n = 344)			
	Good management n (%)	Insufficient man- agement n (%)	OR [95% CI]	P*	Good management n (%)	Insufficient man- agement n (%)	OR [95% CI]	P*
Type of disability	100	397		0.005	58	286		0.699
Engine	79 (23.8)	253 (76.2)	1 [1]		41 (18.5)	181 (81.5)	1 [1]	
Sensory	17 (18.3)	76 (81.7)	0.27 [0.08–0.92]		12 (15)	68 (85)	1.28 [0.64–2.59]	
Cerebral palsy	1 (2.9)	33 (97.1)	0.38 [1.05–1.39]		1 (9.1)	10 (90.9)	2.26 [0.28–18.19]	
Multiple disabilities	3 (7.9)	35 (92.1)	2.83 [0.28–28.57]		4 (12.9)	27 (87.1)	1.53 [0.51–4.61]	
Age	100	397		0.000	58	286		0.002
0–14	1 (1.5)	64 (98.5)	1 [1]		2 (4.7)	41 (95.3)	1 [1]	
15–29	8 (7.3)	102 (92.7)	0.20 [0.02–1.63]		9 (10.8)	74 (89.2)	0.40 [0.08–1.94]	
30–44	36 (29.5)	86 (70.5)	0.04 [0.00–0.28]		19 (21.8)	68 (78.2)	0.17 [0.04–0.79]	
45–59	38 (30.4)	87 (69.6)	0.04 [0.00–0.27]		22 (28.9)	54 (71.1)	0.12 [0.03–0.54]	
60–74	12 (20.3)	47 (79.7)	0.06 [0.01–0.49]		5 (14.7)	29 (85.3)	0.28 [0.05–1.56]	
≥ 75	5 (31.3)	11 (68.8)	0.03 [0.00–0.32]		1 (4.8)	20 (95.2)	0.98 [0.08–11.41]	
Marital status	99	333		0.000	56	246		0.315
Married/Couple	68 (31.8)	146 (68.2)	1 [1]		25 (23.6)	81 (76.4)	1 [1]	
Single	20 (12.1)	145 (87.9)	3.38 [1.95–4.85]		13 (13.5)	83 (86.5)	1.97 [0.94–4.12]	
Divorced/Separated	10 (27)	27 (73)	1.26 [0.58–2.74]		6 (20.7)	23 (79.3)	1.18 [0.43–3.23]	
Widowed	1 (6.3)	15 (93.7)	6.99 [0.90–53.98]		12 (17.1)	58 (82.9)	1.49 [0.69–3.21]	
Monthly income	99	333		0.000	56	245		0.043
0–50,000	71 (19.6)	291 (80.4)	1 [1]		52 (17.8)	240 (82.2)	1 [1]	
≥ 50,000	28 (40)	42 (60)	0.37 [0.21–0.63]		4 (44.4)	5 (55.6)	0.27 [0.07–1.04]	
Education level	100	391		0.689	58	279		0.047
No level	59 (19.3)	246 (80.7)	1 [1]		35 (15.4)	193 (84.6)	1 [1]	
Primary	17 (20.5)	66 (79.5)	0.93 [0.51–1.70]		12 (16)	63 (84)	0.95 [0.47–1.95]	
Secondary/University	24 (23.3)	79 (76.7)	0.79 [0.46–1.35]		11 (32.4)	23 (67.6)	0.38 [0.17–1.85]	

(Continued)

TABLE 6 Continued

Characteristics	Male (n = 497)				Female (n = 344)			
	Good management n (%)	Insufficient management n (%)	OR [95% CI]	P*	Good management n (%)	Insufficient management n (%)	OR [95% CI]	P*
Profession	99	333		0.000	56	245		0.480
No profession	43 (15.8)	229 (84.2)	1 [1]		46 (17.5)	217 (82.5)	1 [1]	
Civil servant	4 (26.7)	11 (73.3)	0.52 [0.16–1.70]		1 (50)	1 (50)	0.21 [0.01–3.45]	
Craftsman/Worker	13 (21.7)	47 (78.3)	0.68 [0.34–1.36]		5 (29.4)	12 (70.6)	0.51 [0.17–1.51]	
Shopkeeper/ Housekeeper	6 (42.9)	8 (57.1)	0.25 [0.08–0.76]		3 (25)	9 (75)	0.64 [0.17–2.44]	
Cultivator	23 (53.5)	20 (46.5)	0.16 [0.08–0.32]		0 (0)	4 (100)	–	–
Other	10 (35.7)	18 (64.3)	0.34 [0.15–0.78]		1 (33.3)	2 (66.7)	0.42 [0.04–4.77]	
Income-generating activity	99	333		0.667	56	245		0.001
Yes	77 (23.4)	252 (76.6)	1 [1]		32 (28.6)	80 (71.4)	1 [1]	
No	22 (21.4)	81 (78.6)	0.89 [0.52–1.52]		24 (12.7)	165 (96.3)	2.75 [1.52–4.97]	
Disability causes	100	397		0.784	58	286		0.002
Other causes	75 (20.2)	297 (79.8)	1 [1]		52 (51.3)	192 (78.7)	1 [1]	
NTD	13 (23.2)	43 (76.8)	0.83 [0.43–1.63]		1 (2.4)	41 (97.6)	11.10 [1.49–82.65]	
Unknown	12 (17.4)	57 (82.6)	1.20 [0.61–2.35]		5 (8.6)	53 (91.4)	2.87 [1.09–7.55]	

*p-value, calculated using Chi-square test; OR, Odds ratio; CI, Confident interval; IGA, income generating activity; NTD, neglected tropical diseases. Values in bold in the table are below the p-value set at 0.005.

TABLE 7 Distribution of PWD linked to NTD or not, according to multivariable analysis with inadequate management in Benin and Côte d'Ivoire.

Variables	Good management n (%)	Insufficient management n (%)	ORa [95% CI]	P*
Age	158	683		0.000
15–29	17 (08.8)	176 (91.2)	1 [1]	
30–44	55 (26.3)	154 (73.7)	0.29 [0.16–0.54]	0.000
45–59	60 (29.9)	141 (70.1)	0.26 [0.14–0.47]	0.000
60–74	17 (18.3)	76 (81.7)	0.49 [0.23–1.03]	0.062
≥ 75	06 (16.2)	31 (83.8)	0.47 [0.16–1.32]	0.150
Profession	155	578		0.001
No profession	89 (16.6)	446 (83.4)	1 [1]	
Civil servant	5 (29.4)	12 (70.6)	1.14 [0.34–3.80]	0.829
Craftsman/Worker	18 (23.4)	59 (76.6)	0.86 [0.47–1.58]	0.634
Shopkeeper/Housekeeper	9 (34.6)	17 (65.4)	0.32 [0.12–0.81]	0.017
Cultivator	23 (48.9)	24 (51.1)	0.30 [0.16–0.59]	0.000
Others	11 (35.5)	20 (64.5)	0.42 [0.18–0.96]	0.039
Monthly income				0.003
0–50,000	123 (18.8)	531 (81.2)	1 [1]	
≥ 50,000	32 (40.5)	47 (59.5)	0.41 [0.23–0.74]	0.003
Disability causes	158	683		0.000
Others causes	127 (20.6)	489 (79.4)	1 [1]	
Skin-NTD	14 (14.3)	84 (85.7)	2.15 [1.13–4.09]	0.000
Unknown	17 (13.4)	110 (86.6)	0.42 [1.73–6.07]	0.000

*p value, calculated using Chi-square test; ORa, adjusted Odds ratio; CI, Confident interval; IGA, income generating activity; Skin-NTD, Skin neglected tropical diseases. Values in bold in the table are below the p-value set at 0.005.

disability persisted, we also tried traditional treatment without success. Friends referred us to a specialized hospital where she was operated on. The results were not satisfactory so, we had to perform further operations. Today, given the household financial situation, we no longer have the means to meet other expenses..." (Mother of Annick, motor-impaired, Taabo-Côte d'Ivoire).

The need for financial autonomy is crucial for the well-being of persons with disabilities (PWDs). While both governments recognize the need to offer support aimed at empowering PWDs, the assistance provided often falls short and remains inadequate due to a paucity of resources. As noted by Ms. KA from Côte d'Ivoire:

"For Ivorian society, PWDs are integrated into the system and benefit from the support of the Ministry of Employment and Social Protection. Institutions have been established to include them in education and employment. However, financial support is limited, and the actions undertaken often depend on available resources. Despite financial difficulties, initiatives such as financial support for PWD and their families or home visits show a commitment to these people. Financial challenges persist,

but efforts are being made to provide ongoing support" (Ms. KA, 42, social worker and director of the social center, Yamoussoukro-Côte d'Ivoire).

3.6.3 Rehabilitation services are limited

Rehabilitation services available in each country are generally limited to referral centers typically financed by charitable organizations or regional hospitals. As Mr. GA, 33, a senior nurse and Mrs. YA, a 40-year-old physiotherapist from Divo, Côte d'Ivoire explain:

In terms of disability management, we do not have the resources or facilities to provide onsite rehabilitation, for example. We therefore refer patients to Taabo General Hospital. The costs of rehabilitation services vary, but can start at 500 francs (1 euro per session), with possible adjustments depending on the patient's social situation. We do not offer direct disability management, but sometimes we organize home visits, if necessary, especially for patients who are unable to move. (Mr. GA, 33, senior nurse, CS Kouamékro-Côte d'Ivoire).

TABLE 8 Study of the association between management, male sex and some demographic, economic and medico-social characteristics among PWD (whether or not related to NTD) in Benin and Côte d'Ivoire.

Variables	Good management n (%)	Insufficient management n (%)	ORa [95% CI]	P*
Age	99	333		0.001
15–29	08 (07.3)	102 (92.7)	1 [1]	
30–44	36 (29.5)	86 (70.5)	0.26 [0.11–0.60]	0.002
45–59	38 (30.4)	87 (69.6)	0.25 [0.11–0.58]	0.001
60–74	12 (20.3)	47 (79.7)	0.40 [0.15–1.08]	0.070
≥ 75	05 (31.3)	11 (68.8)	0.21 [0.05–1.82]	0.024
Monthly income	99	333		0.021
0–50,000	71 (19.6)	291 (80.4)	1 [1]	
≥ 50,000	28 (40.0)	42 (60.0)	0.47 [0.25–0.89]	0.021
Profession	99	333		0.001
No profession	43 (15.8)	229 (84.2)	1 [1]	0.002
Civil servant	04 (26.7)	11 (73.3)	0.32 [0.35–4.99]	0.678
Craftsman/Worker	13 (21.7)	47 (78.3)	0.80 [0.39–1.67]	0.559
Shopkeeper/Housekeeper	06 (42.9)	08 (57.1)	0.35 [0.11–1.16]	0.086
Cultivator	23 (53.5)	20 (46.5)	0.25 [0.12–0.50]	0.000
Others	10 (35.7)	18 (64.3)	0.49 [0.20–1.18]	0.112

*p value, calculated using Chi-square test; ORa, adjusted Odds ratio; CI, Confident interval; IGA, income generating activity. Values in bold in the table are below the p-value set at 0.005.

The physiotherapy department supports both outpatients and those at the Raoul Follereau hospital. The equipment includes two rehabilitation bikes, parallel bars, and other tools tailored to each condition. Patients are seen based on the severity and urgency of their situation. Services are free for those funded by the Raoul Follereau Foundation, while others have to pay for their care. Some patients with complications require surgery, which is often unavailable and financially out of reach for PWD. (Mrs. YA, 40 years old, physiotherapist, Divo-Côte d'Ivoire).

At referral centers where visits to former patients are offered, the role of these visits varies depending on the case and the stage of the disease. But the main concern is wound management, and sometimes it is to teach the disabled person how to take care of themselves on a daily basis.

4 Discussion

This study adopted an inclusive approach by considering the individual PWDs holistically and addressing both their medical

TABLE 9 Study of the association between management, female sex and some demographic, economic and medico-social characteristics among PWD (whether or not related to NTD) in Benin and Côte d'Ivoire.

Variables	Good management n (%)	Insufficient management n (%)	ORa [95% CI]	P*
Income-generating activity	56	245		0.000
Yes	106 (94.6)	06 (05.4)	1 [1]	
No	148 (78.3)	41 (21.7)	3.04 [1.64–5.61]	0.000
Disability causes	58	286		0.003
Others causes	52 (51.3)	192 (78.7)	1 [1]	
Skin-NTD	01 (02.4)	41 (97.6)	0.78 [1.67–95.31]	0.014
Unknown	05 (08.6)	53 (91.4)	3.49 [1.30–9.43]	0.013

*p value, calculated using Chi-square test; ORa, adjusted Odds ratio; CI, Confident interval; IGA, income generating activity; Skin-NTD, Skin neglected tropical diseases. Values in bold in the table are below the p-value set at 0.005.

and social support. Five factors were considered in the assessment of the management of disabilities: access to diagnosis, treatment, rehabilitation, psychosocial support, prevention, and follow-up services. The results demonstrate that out of a total of 841 PWD, 63.3% had support that was considered insufficient. Very few studies have been conducted on this subject, most of which have focused only on the qualitative aspect. Some of these studies have examined disability management, which is defined as an active process aimed at minimizing the impact of an impairment (resulting from an injury, illness or condition) on an individual's ability to participate competitively in the work environment (12).

Hannah Kuper reported that disability management associated with neglected tropical diseases (NTDs) is often overlooked by programs focused on infectious disease control. To be more effective, these programs need to broaden their focus to include the provision of rehabilitation and mental health support services, as well as initiatives to combat stigma by eliminating NTDs (13). These efforts will contribute to the inclusion and well-being of people living with NTDs, demonstrating the current inadequacy of disability management (14).

In addition, Buruli ulcer and leprosy are closely linked, as shown by a study conducted in Liberia on the integrated management of these two neglected tropical skin diseases. This study reveals that another form of management should be considered. Thus, Mateo Prochazka et al. presented the results in three sections corresponding to patients' experiences along three dimensions of management: (1) health education, disease identities, and inter-disease stigma; (2) experiences of pain and healing through wound management and medication; and (3) rehabilitation experiences to address stigma and disability (15). It is therefore essential to consider these three dimensions and develop integrated management strategies that address not only the medical but also the psychosocial aspects of patients (16).

In addition, a 2012 study on the measurement of disability in patients with lymphatic filariasis examined generic tools used in morbidity management programs. The results of Lynne Zeldenryk et al. showed that the generic disability tools currently used by programs fail to measure the majority of known impacts of disability related to this disease. Therefore, the results of this review support the development of a lymphatic filariasis-specific disability measurement tool and raise doubts about the relevance of generic disability tools for assessing disability related to neglected tropical diseases (NTDs) globally (17, 18).

The median age of the PWD included in this study was 38 years. Thus, the PWD population is predominantly young. Badu et al., in a study that focused on barriers to access to health management for people with disabilities in the Kumasi metropolis in Ghana, reported that the average age of the respondents was 38 years (19).

Munthali et al. researched barriers to accessing health services for people with disabilities in Malawi and reported that the average age was greater than that reported in this study (47.02 years) (20).

The differences in the mean age of PWD between the different studies could be explained by the distinct socioeconomic and cultural contexts of the countries studied, which can influence the characteristics of the PWD population. For example, disparities in

life expectancy, socioeconomic conditions and cultural attitudes toward disability may contribute to these variations in mean age (21). In addition, this study is distinguished by its comprehensive approach to management, encompassing not only medical aspects but also social, economic and cultural factors. By taking these different aspects into account, the present study offers a more complete understanding of the situation of PWD, which could influence the composition of the sample according to age (22). Thus, these results provide more detailed information on the challenges and needs of PWD, thus providing a solid basis for the development of policies and interventions aimed at improving their quality of life (23).

In this study, we had a predominance of PWD with no profession. This finding has been reported by several authors. Indeed, Badu et al. reported that 28.6% of PWD had no profession (19). Similarly, Koumbouna Coulibaly conducted a study on the disability and management of people with disabilities in the Banconi district of Mali. Based on their findings, it appeared that women with disabilities are particularly represented in this population. This finding highlights the specific position of women with disabilities in society (24). Women with disabilities may face unique challenges due to their dual sex and disability identities, which can increase their vulnerability to social exclusion and inequality (25).

There was a significant relationship between PWD income and undermanagement in the present study, which was consistent with several other studies, such as the study conducted by Yen et al. on factors associated with the use of free preventive health management for adults among people with physical disabilities in Taiwan: a nationwide population-based study. In that study, the results of the study showed that people with insured monthly payrolls of over NT\$15,840 (excluding NT\$48,200 to NT\$57,800) have a higher utilization rate than those earning less than NT\$15,840, which is consistent with the results of previous studies (26). These results highlight the importance of considering income and family burdens when health insurance policies are designed. They highlight socioeconomic disparities in access to health management and underscore the need for measures to ensure adequate coverage for all categories of the population, regardless of their income level or family situation (27).

In this study, causes of disability other than neglected tropical diseases were more predominant (79.4%). In contrast, in the study conducted by Koumbouna Coulibaly, disease-related disabilities were the majority, representing 36.9% of the cases (24). This difference may be explained by the different populations studied. Another possible contributing factor could be the methodology used in each study, including participant selection criteria, data collection tools, and samples studied.

At the end of the present study, it was found that disabilities related to these diseases were not more common than those attributable to other causes. However, the majority of PWD received insufficient management. This insufficiency was manifested in particular by a lack of adequate support in several aspects of their lives. The factors associated with the management of people with disabilities in the present study were age, occupation, income, and causes of disability. In addition, it would be relevant to explore the mechanisms by which socioeconomic factors influence access to

management to propose appropriate interventions. Finally, it is essential to conduct key experiments, such as the evaluation of pilot programs that integrate solutions on the basis of these factors, such as expanding the resources allocated to the management of PWD in endemic areas and raising awareness among vulnerable populations about the importance of early detection of Skin-NTD.

However, some limitations must be considered. The reliance on self-reported data may have introduced bias due to recall bias, social desirability bias, and potential differences in understanding and interpreting questions. The use of simultaneous translation during interviews could have introduced the potential for information bias, although efforts were made to minimize this through rigorous interviewer training and pre-testing of the translated questionnaires.

Data availability statement

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Ethics statement

The study was approved by the research ethics committee of the University of Parakou (CLERB-UP) in Benin under authorization N°0492/CLERB-UP/P/SP/R/SA of 19/11/2021 and by the National Life and Health Sciences Ethics Committee (CNESVS) of Côte d'Ivoire under authorization N/Réf: 076-22/MSHPCMU/CNESVSkp of 28/07/2022. Written informed consent was obtained from all participants, with an emphasis on the voluntary nature of participation. It was made clear that there would be no consequences for those who chose not to participate.

Author contributions

YT: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Software, Writing – original draft, Writing – review & editing. FNG: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. SIA: Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. SZ: Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. KC-S: Data curation, Formal analysis, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. PB: Conceptualization, Data curation, Formal analysis, Methodology, Writing – original draft, Writing – review & editing. FAG: Data curation, Formal analysis, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. KK: Data curation, Formal analysis, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. SGA: Writing – original draft, Writing – review & editing. FZM: Writing – original draft, Writing – review & editing. PD: Writing – original draft, Writing – review & editing. BY: Writing –

original draft, Writing – review & editing. FH: Writing – original draft, Writing – review & editing. JA: Writing – original draft, Writing – review & editing. YF: Writing – original draft, Writing – review & editing. HJ: Writing – original draft, Writing – review & editing. GS: Methodology, Writing – original draft, Writing – review & editing. JH: Conceptualization, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. MK: Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. AD: Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. MN: Conceptualization, Data curation, Methodology, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. CJ: Conceptualization, Funding acquisition, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. AG-M: Conceptualization, Funding acquisition, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. RJ: Conceptualization, Data curation, Formal analysis, Funding acquisition, Methodology, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Funding

The author(s) declare financial support was received for the research, authorship, and/or publication of this article. The data contained in this article are part of a research project titled “Rational approach for effective management of disabilities related to Skin-NTD in Benin and Cote d'Ivoire”. It is funded by the ANESVAD Foundation and the RAOUL FOLLEREAU Foundation with the grant number REG-3621/21.

Acknowledgments

We would like to thank all the members of the disability project team, the staff of the BU Screening and Treatment Center and Leprosy Treatment Center, and the National Program for the Fight against Leprosy and Buruli Ulcer in Benin. We would also like to thank the National Program for the Control of Leprosy and Buruli Ulcer in Benin, the National Program for the Control of Buruli Ulcer in Côte d'Ivoire and the National Program for the Elimination of Leprosy in Côte d'Ivoire for their administrative and technical support in carrying out this study for their administrative and technical support. We would also like to thank the RAOUL FOLLEREAU Benin Foundation, the RAOUL FOLLEREAU Ivory Coast Foundation and the ANESVAD Foundation.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

The author(s) declare that no Generative AI was used in the creation of this manuscript.

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Supplementary material

The Supplementary Material for this article can be found online at: <https://www.frontiersin.org/articles/10.3389/ftd.2025.1522660/full#supplementary-material>

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