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Research Article

Prevalence of Psychological Distress in Suriname In Urban and Rural Areas: The Suriname Health Study

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Abstract

Objective:

To describe the presence of mental distress in a representative sample of the Surinamese ethnic groups in the population, across urban and rural areas.

Design and Methods:

The Kessler Psychological Distress Scale was applied to data from the Suriname Health Study (n=5,434 (15 to 65 years)) designed according to WHO Steps guidelines, to determine prevalences for mental distress in all living areas. Calculations were made in subgroups of sex, age, ethnicity, education, income, marital and employment status. The Odds Ratio (OR) for Sex and Ethnicity was estimated for mild-moderate and severe mental distress.

Results:

An overall prevalence of 3.8% (95%CI, 3.3-4.4) was observed for severe mental distress, 4.9% (95%CI, 4.4-5.5) for moderate mental distress and 10.8% (95%CI,10.0-11.6) for mild mental distress. The OR for mild-moderate and severe mental distress was 0.7 and 0.5 for men compared to women and higher prevalence of all categories of mental distress was found in women compared to men. Respondents with lower education and lower income showed higher prevalence of all categories of mental distress. Prevalence was also higher among respondents living in urban versus rural coastal areas, among singles versus people living with a partner and in the unemployed versus the employed. Maroons had higher Odds for mild-moderate and severe mental distress compared to Hindustani. Amerindian and Javanese

had lower Odds for mild-moderate mental distress and Creole had lower Odds for Severe mental distress compared to Hindustani.

Conclusions:

Overall 19.5% of respondents reported mental distress. The main risk factors were female gender, Maroon ethnicity, low level of education and income, living in urban areas, unemployment and being single.

Keywords:
Ethnicity; Mental distress; Risk factors; Prevalence; Kessler Psychological Distress Scale; Suriname

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Introduction

The Republic of Suriname with its capital Paramaribo is situated in the North of South America bordering French Guiana in the East, Guyana in the West and Brazil in the South. According to the most recent census (2012), Suriname had a population of 541,638 of which the vast majority lives in the coastal area. The interior of the country is thinly populated by Maroons and Indigenous populations. The country is ethnically very diverse with the main ethnic groups being Hindustanis (27.4%), Maroons (21.7%), Creoles (15.7%), Javanese (13.7%), and Mixed (13.4%) [1].

At the launch of the Mental Health Policy 2012-2016 document, the then Minister of Health stated that there is a growing recognition of the prevalence and impact of mental health problems in Suriname. Strengthening the mental health information system was one of the priorities in the policy document [2]. Specific data on mental health, however, is still very limited and focusses on suicide, a major national concern. The 2012 national suicide rate of 26.7 per 100.000 widely exceeds the 2012 world age-standardized suicide rate of 11,4 per 100.000 (15.0 for males and 8.0 for females) [3], [4]. In Suriname, particularly men are at risk with a male-female ratio of 3:1. The vast majority of suicides happen among Hindustani (62%), followed by Creole/Maroon (25%) [5]. Currently, the Psychiatric Centrum Suriname (the only mental health hospital in Suriname) in cooperation with Arkin Amsterdam is conducting a survey on the prevalence of fear, depression and substance abuse in the coastal districts of Paramaribo and Nickerie. 1837 respondents participated in the study and preliminary results show a prevalence similar to the average world prevalence. However, the number of respondents with symptoms of mental health disorders that seek help or support is very low [6].

In the Caribbean and South America few studies on estimating the prevalence of mental health disorders have been conducted and moreover, are limited to adolescents. About half of adolescents reported mild to severe symptoms of depression and one third reported moderate to severe symptoms of depression

[7]. Silva de Lima, et al [8] described a prevalence of 20-25% of minor psychiatric disorders for South America, with an exception of 36% for Chili. Results from surveys in Brazil and Chili suggest that depression, anxiety and alcohol abuse are the most prevalent disorders. The main risk factors in these studies were low level of education, low income, old age and female gender [9], [10]. A study in Brazil on mental health of women aged 18 to 70 years identified the following risk factors: working more than ten hours per day, combining a paid job with marital responsibilities, and marital separation [11].

The main objective of this study was to describe the presence of mental disorders in a representative sample of the Surinamese ethnic groups of the population, across urban and rural areas.

Methods

We used data of the Suriname Health Study [12], a cross sectional population study, designed according to WHO Steps guidelines [13] and approved by the Ethics Committee of the Ministry of Health. As described previously,[12] this study used a stratified multistage cluster sample of households to select respondents between March and September 2013. In total, 343 clusters were selected randomly within the enumeration areas of the ten districts of Suriname. With a Kish grid [14], pre-assigned table of random numbers, the respondent was identified in the selected household, informed about the details of the study, and then asked to sign for consent. The group for this study comprised 5,434 subjects aged 15 to 65 years.

Demographic Factors

Apart from sex and age we included residential area, marital status, educational level, income status and employment in the analysis. The residential addresses were stratified into urban, rural coastal areas and the rural interior. [15] Educational levels were divided into low (primary school education or lower), middle (middle or secondary education) and high (above middle or secondary) education. Household income was classified as the income status quintile from the Ministry of Internal Affairs of Suriname in Surinamese dollars, SRD (1USD = 3.35 SRD). The 1st quintile corresponded to the lowest income and the 5th to the highest. Because of the small number of respondents in the 4th and the 5th quintile these two were combined in the analysis. Working and studying participants were classified as employed. Participants living with a partner were classified as having a partner.

Mental Health

For the measurement of psychological distress the Dutch version of the Kessler Psychological Distress Scale was used [16], [17]. The Scale was translated into 2 other main spoken languages in Suriname (Sranang tongo (the lingua franca) and Surinami Hindi). The Scale was not only adapted in terms of language, but when necessary cultural aspects were adapted. For measurements in urban and rural areas the test scores for K10 were used. For measurements in tribal communities K6 scores were used as recommended by Anderson et all [18]. Both scales are designed to measure levels of negative emotional states experienced in the four weeks prior to the interview and are widely used to screen on psychological distress [19]. The K10 categorizes levels of psychological distress in no (10-19) ,mild (20-24), moderate (25-29) and severe (30-50). The K6 categorizes Levels psychological distress into no (6-11) ,mild - moderate (12-19) and severe (20-30). To measure overall prevalences the area specific measurement scales were used to classify distress into no, mild - moderate and severe levels of psychological distress.

Statistical Analysis

All collected data were subjected to a weighting procedure so inferences could be made to the whole population. The weights used for analysis were calculated to adjust for probability of selection, non-response and differences between the sample population and target population. We used the weighted data first, to calculate the proportions of the population overall, per ethnic group and by residential areas. Second the prevalence of no, mild, moderate and severe Levels of psychological distress was assessed overall and in the various subgroups. Differences between the subgroups were assessed using the Chi - square test. For comparison of the subgroups the Bonferonni method was used. We used the Statistical Packages for Social Sciences (SPSS 21.0) for analyses.

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Results

In the overall population we measured a prevalence for severe mental health disorders of 2.8%(95%CI 2.3-3.3); the prevalence for mild and moderate mental health disorders combined was 19.4%(95%CI 18.3-20.5).

Table 1 shows that the highest percentage of men was found in Creoles (54.3(95%Confidence interval (CI) 50.5-58.1)) and the highest mean age in Javanese (39.0(Standard deviation (SD)from the mean =13.3)). We found low education and income most frequently in Amerindians (79.7 (95%CI 73.8-84.3), 54.8% (95%CI 45.7-62.5)) and Maroons(78.1 (95%CI 75.5-80.6), 58.1% (95%CI 54.2-61.8)). The highest percentage of people living with a partner was found in Javanese (71.3% (95%CI 68.0-74.3)) and the highest percentage of employed was found in Creoles (78.9% (95%CI 75.6-81.9)).

Table 2 shows higher percentage of men (51.3 (95%CI 48.1- 54.7)) and the higher mean age (36.4(SD=13.7)) was found in the rural coastal area. The highest percentage of low-education

Table 1. Subject characteristics; overall and per ethnic group (n=5434)

	Overall population	Amerindian	Creole	Hindustani	Javanese	Maroon	Mixed
	n=5434	n=419	n=658	n=1248	n=884	n=1339	n=796
Men % (95% CI)	49.3(48.0- 50.6)	39.4(33.0-45.6)	54.3 (50.5-58.1)	52.9 (50.5-55.3)	51.6(48.0-55.0)	44.1(41.1-47.1)	46.8(43.5-50.0)
Age, mean (SD) years	36.0(13.6)	35.6(14.1)	37.9(13.8)	37.5(13.4)	39.0(13.3)	32.6(12.6)	33.7(13.6)
Residential area % (95% CI)							
Urban coastal	72.3(71.1- 73.5)	31.02(25.3-37.2)	85.5(82.6-88.0)	83.7 (81.8-85.4)	70.9(67.6-74.0)	50.7 (47.6-53.7)	85.1(82.6-87.2)
Rural coastal	16.4(15.4- 17.4)	32.42(26.4-38.5)	14.51(12.0-17.4)	16.3(14.5-18.1)	29.1(26.1-32.4)	7.17(5.7- 8.8)	14.5(12.3-16.9)
Rural interior	11.3(10.5- 12.2)	36.6(30.3-42.7)	0.0(0.0- 0.6)	0.0(0.0-0.2)		42.1(39.2-45.2)	0.4(0.1- 1.0)
Education % (95% CI)							
Low	54.8(53.5- 56.2)	79.7(73.8-84.3)	37.4(33.5-41.1)	53.2 (50.7-55.7)	53.7(50.1-57.1)	78.1 (75.5-80.6)	34.5(31.4-37.69)
Middle	27.0(25.8- 28.2)	17.85(13.1-23.1)	34.8(31.0-38.5)	28.5 (26.3-30.8)	32.3(29.1-35.7)	13.3(11.3-15.5)	35.6(32.4-38.7)
High	18.2(17.2- 19.3)	2.5(0.7- 4.7)	27.8 (24.4-31.4)	18.3(16.4-20.3)	14.0(11.7-16.6)	8.6(6.9- 10.4)	29.9(27.0-33.0)
Income status % (95% CI)							
q1-lowest	35.7 (34.0- 37.4)	54.8(45.7-62.5)	23.9(19.8-28.4)	30.59(27.6-33.6)	24.7(20.9-28.6)	58.1(54.2-61.8)	24.7(21.0-28.49)
q2	33.3(31.7- 35.0)	27.1(20.0-35.1)	39.2 (34.5-44.3)	38.06(34.9-41.2)	37.8(33.5-42.1)	27.7(24.3-31.2)	27.6(23.8-31.6)
q3	14.1(13.0- 15.4)	7.1(3.4- 12.4)	15.4(12.0-19.2)	17.09(14.8-19.6)	19.7(16.3-23.4)	7.5(5.6- 9.7)	16.0(12.9-19.3)
q4	6.5(5.6- 7.4)	2.8(0.4- 6.0)	8.7(6.1- 11.8)	6.0(4.6- 7.6)	6.7(4.7- 9.2)	3.0 (1.9- 4.5)	11.5(9.0- 14.6)
q5-highest	10.4(9.3- 11.5)	8.2(3.9-13.3)	12.8(9.8- 16.6)	8.3(6.6- 10.2)	11.3(8.6-14.2)	3.8(2.5- 5.5)	20.2(17.0-24.0)
Living with partner % (95% CI)	51.4(50.0-52.7)	65.4(59.0-71.3)	31.5.(28.0-35.2)	61.6(59.1-63.9)	71.3(68.0-74.3)	43.4(40.1-46.6)	43.4(40.1-46.6)
Employed % (95% CI)	51.4(50.0- 52.7)	40.9(34.6-47.3)	78.9(75.6-81.9)	65.8(63.4-68.0)	70.3(67.1-73.5)	56.7(53.6-59.6)	76.3(73.5-78.9)

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Table 2. Subject characteristic by living area

	Urban area	Rural coastal area	Rural interior area
	n=2604	n=1876	n=954
Men % (95% CI)	49.3(47.7- 50.9)	51.3 (48.1- 54.7)	46.5(42.5- 50.4)
Age, mean (SD) years	35.9(13.6)	36.4(13.7)	35.7(13.0)
Education % (95% CI)			
Low	46.5(44.9- 48.1)	64.6(61.3- 67.7)	92.6(90.3- 94.5)
Middle	30.6(29.1- 32.1)	25.9(23.0- 28.9)	6.3(4.5- 8.4)
High	22.9(21.6- 24.3)	9.6(7.7- 11.7)	1.1(0.5- 2.2)
Income status % (95% CI)			
q1-lowest	29.1(27.2- 31.0)	33.37(29.3- 37.5)	72.7(68.3- 76.7)
q2	34.9(32.9- 36.9)	37.5(33.3- 41.6)	20.3(16.6- 24.2)
q3	15.6(14.2- 17.2)	16.6(13.6- 20.0)	3.6(2.1- 5.7)
q4	7.5(6.5- 8.7)	6.2(4.3- 8.4)	1.3(0.5- 2.7)
q5-highest	12.9(11.6- 14.4)	6.4(4.4- 8.7)	2.1(1.0- 3.6)
Living with partner % (95% CI)	49.7(48.1- 51.3)	59.5(56.1- 62.6)	50.3(46.2- 54.2)
Employed % (95% CI)	71.9(70.4- 73.2)	64.7(61.6- 67.9)	36.0(32.2- 39.8)

(92.6(95%CI 90.3- 94.5)) and income (72.7(95%CI 68.3- 76.7)) was observed in the rural interior. In the rural coastal area we observed the highest percentage of people living with a partner (59.5(95%CI 56.1-62.6)) and in the Urban area we observed the highest percentage of employed people (71.9 (95%CI 70.4- 73.2)).

In Table 3 in the urban and rural coastal population we observed a prevalence for severe mental health disorders of 3.1%(95%CI 2.5-3.6); moderate mental health disorders of 4.8%(95%CI 4.1-5.4)and mild mental health disorders of 11.1(95%CI 10.1-12.1). We found higher prevalences of mild-, moderate- and mild-mental health disorders in women compared to men ($p<0.05$). The highest percentage for moderate- and severe mental health disorders was found in Maroons followed by Mixed and Hindustani. There is a significant difference in the prevalence of mental disorders between age group of 15-24 (13.4%(95% CI 11.5-15.3), compared to the age group 35-44 (9.5%(95% CI 7.7-11.4) for mild mental disorders. Respondents with lower-education and income showed higher prevalences of moderate- and severe mental health disorders compared to those with higher education and income. Higher prevalences of mild-, moderate and severe mental health disorders were observed in people living in urban areas compared to rural coastal areas, in single people compared to those living with a partner and in those not employed compared to the employed.

Table 4 showed the prevalence of the severe (2.5(95% CI 1.9-3.1)) and mild-moderate (16.1(95% CI 14.7-17.5)) mental disorders of the overall population of the rural interior. There was no difference between men and women in severe mental disorders but for those with mild and moderate disorders the prevalence in men was higher.

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Table 3. Prevalence of Mental distress per sub-category In the urban and rural coastal areas

Category	Subcategory	No%(95%CI)	Mild%(95%CI)	Moderate%(95%CI)	Severe%(95%CI)
	Overall population (n=4481) ((4481) ((n=44(n=44815436))	81.1(79.8-82.3)	11.1(10.1-12.1)	4.8(4.1-5.4)	3.1(2.5-3.6)
Gender	Men (n=1755)	84.9(83.5-86.3)[a]	9.2(8.0-10.4)[a]	4.0(3.2-4.8)[a]	1.9(1.4-2.5)[a]
	Women(n=2726)	77.3(75.6-79.0)[b]	13.0(11.6-14.3)[b]	5.5(4.6-6.4)[b]	4.2(3.4-5.0)[b]
Ethnicity	Creole (n=657)	84.5(81.7-87.2)[a]	10.1(7.8-12.4)[a]	4.1(2.6-5.6)[a]	1.4(0.5-2.2)[a]
	Hindustani(n=1247)	80.4(78.3-82.4)[b,c]	11.5(9.9-13.2)[a,b]	4.4(3.3-5.4)[a]	3.7(2.8-4.7)[b]
	Javanese(n=884)	86.6(84.1-89.0)[a]	6.9(5.1-8.7)[c]	3.7(2.4-5.1)[a]	2.8(1.6-4.0)[a,b]
	Mixed(n=788)	78.9(76.2-81.5)[c,d] ac,d	13.5(11.3-15.8)[b]	5.2(3.7-6.6)[a]	2.4(1.4-3.4)[b]
	Maroon(n=536)	75.2(71.9-78.5)[d]	14.3(11.7-17.0)[b]	5.7(3.9-7.4)[a]	4.8(3.2-6.4)[b]
Age groups	15-24(n=792)	79.0(76.7-81.3) [a]	13.4(11.5-15.3) [a]	5.1(3.8-6.3) [a]	2.5(1.7-3.4) [a]
	25-34(n=956)	81.0(78.7-83.3) [a]	11.1(9.3-13.0) [a, b]	4.5(3.3-5.7) [a]	3.3(2.3-4.4) [a]
	35-44(n=1024)	83.6(81.2-85.9) [a]	9.5(7.7-11.4) [b]	3.7(2.5-4.8) [a]	3.2(2.1-4.4) [a]
	45-54(n=996)	80.2(77.7-82.8) [a]	10.3(8.4-12.3) [a, b]	6.2(4.6-7.7) [a]	3.3(2.1-4.4) [a]
	55-64(n=713)	83.0(79.8-86.2) [a]	10.2(7.6-12.8) [a, b]	4.0(2.3-5.6) [a]	2.8(1.4-4.3) [a]
Residential	Urban coastal (n=2605)	79.6(78.4-80.9)[a]	11.9(10.9-13.0)[a]	5.2(4.5-5.9)[a]	3.2(2.6-3.7)[a]
Areas	Rural coastal (n=1876)	87.6(85.4-89.8)[b]	7.4(5.7-9.1)[b]	2.5(1.5-3.5)[b]	2.5(1.5-3.5)[a]
Education	Low(n=2324)	79.5(77.8-81.1)[a]	11.3(10-12.6)[a]	6.0(5.0-7.0)[a]	3.2(2.5-4.0)[a]
	Middle(n=1198)	83.1(81.1-85.1) [b]	10.2(8.6-11.8)[a]	3.6(2.6-4.6) [b]	3.1(2.2-4.0)[a]
	High(n=775)	82.0(79.6-84.5) [b]	12.0(9.9-14.1)[a]	3.3(2.2-4.5) [b]	2.7(1.6-3.7)[a]
Income status	q1-lowest(n=836)	72.1(69.0-75.2)[a]	12.7(10.4-15.0) [a]	10.4(8.3-12.5)[a]	4.8(3.3-6.3)[a]
	q2(n=949)	83.4(81.1-85.8)[b]	9.5(7.6-11.3)[b]	4.3(3.0-5.6)[b]	2.8(1.8-3.9)[b]
	q3(n=408)	84.6(81.2-88.0)[b]	9.8(7.0-12.6)[a,b]	3.0(1.4-4.7)[b,c]	2.6(1.1-4.1)[a,b]
	q4(n=172)	88.3(83.8-92.8)[b]	9.1(5.1-13.2)[a,b]	1.0(0.0-2.4)[c]	1.5(0.0-3.2) [b]
	q5-highest(n=2630	87.7(84.1-91.3)[b]	7.6(4.7-10.5)[b]	3.5(1.5-5.5)[b,c]	1.3(0.0-2.5) [b]
Living arrangement	Living with partner (n= 2532)	83.0(81.5-84.5)[a]	9.9(8.7-11.0) [a]	4.4(3.6-5.2)[a]	2.8(2.1-3.4)[a]
	Single (n=1894)	79.1(77.5-80.8)[b]	12.4(11.1-13.8) [b]	5.0(4.1-5.8)[a]	3.5(2.7-4.2)[a]
Employment	Employed (n=1641	82.8(81.6-84.1)[a]	10.6(9.5-11.6)[a]	3.9(3.2-4.5)[a]	2.7(2.2-3.3)[a]
	0				
	Not Employed (n=2840)	77.0(74.8-79.2)[b]	12.4(10.7-14.1)[a]	6.8(5.4-8.1)[b]	3.9(2.9-4.9)[b]

Each subscript letter denotes a subset of subcategories whose column proportions do not differ significantly from each other at the .05 level.

Table 4. Prevalence of Mental distress per subcategory in the interior

Category	Subcategory	No % (95%CI)	Mild-Moderate% (95%CI)	Severe% (95%CI)
	Overall population (n=992)	81.4(79.9-82.9)	16.1(14.7-17.5)	2.5(1.9-3.1)
Gender	Men (n=301)	74.3(72.7-76.0) [a]	22.5(21.0-24.1) [a]	3.2(2.5-3.8) [a]
	Women(n=691)	77.8(76.7-78.9) [b]	19.4(18.3-20.4) [b]	2.8(2.4-3.3) [a]
	P-value	P<0.05	P <0.05	P>0.05

Each subscript letter denotes a subset of subcategories whose column proportions do not differ significantly from each other at the .05 level.

Discussion

An overall prevalence of 2.8% (95%CI 2.3-3.3) was observed for severe mental health disorders, 19.4% (95%CI 18.3-20.5) for mild and moderate mental health disorders combined. Higher prevalence of all categories of mental health disorders was found in women compared to men with the exception of severe mental health disorders in the interior where no difference was observed. Among Maroons, followed by Mixed, Hindustani. Respondents with lower education and lower income showed higher prevalence of moderate and severe mental health disorders. Prevalence was also higher among respondents living in urban versus rural coastal areas, among singles versus people living with a partner and in unemployed versus employed.

The prevalences found in our results are lower than prevalences reported in Latin America and the Caribbean, [8], [20], [21] but higher than measurements observed in Canada and Australia [22]. The methods of measurement used in Latin America and the Caribbean varied from the K10 used in our study which might explain the difference. For the study in both Canada and Australia the same K10 distress scale we used in our study was used. The analysis in these countries also shows an increase of prevalence as the wealth index decreases. This might explain our the higher prevalence in our study as Suriname is a middle income country and Canada and Australia are wealthy countries. Study results on rates of depression vary widely across Caribbean countries making generalization difficult. Our study however, concurs with research done in Trinidad and Tobago, ([23] and shows higher prevalence for younger age, female gender, lower education level and unemployment as risk factors for mental disorders.

The variations in prevalences between countries can be a result in differences of an unequal distribution of risk factors like low level of education, low income, female gender and older age, [7], [9], [10], [24], [25], [26] which should be explored in more depth.

Most studies show a higher prevalence of mental disorders in women compared to men. In a series on women's Mental Health of the Lancet Psychiatry an effort was made to explain this difference [27]. Factors like cyclical hormonal influence, gender based violence, socio-economic and cultural trends were discussed [28], [29], [30], [31]. In this article however these aspects are not reflected. To contribute to the discussion analysis evaluating this topic needs to be addressed.

The highest percentage for severe-,moderate-and mild mental health disorders was found in Maroons followed by Mixed and Hindustani. The Maroon population is also the group with the lowest wealth index which compares with higher prevalences of mental health disorders. Also the Maroons migrated from their living environment during the eighties because of a civil war in the interior of Suriname, and many Maroons also joined the mining industry. As various studies describe the negative effect of migration on mental health [32], [33] this movement could have contributed to the higher prevalence observed in Maroons.

In comparison with other Caribbean countries a the study in Trinidad showed a lower prevalence on depression among Indo Caribbean (Hindostani) women compared to Afro Caribbean women and women with a Mixed Ethnic background while our study showed higher prevalence of mental disorders

observed in women with an Afro Caribbean (Creole) ethnicity and lower prevalence in women with a Mixed Ethnic background [34]. There are no specific characteristics described for Mixed people but concerning Hindustani possible explanations for the higher prevalence are an increased tendency for suicide and domestic violence [34], [35].

Regarding age we observed the highest prevalence for mild mental health disorders in the youngest age group of our study. This concurs with various studies which describe higher prevalence of various issues of psychological distress like depression, anxiety and suicide among adolescents in the Caribbean [7], [24]. It is also observed that adolescents seek more psychological assistance for issues like depression, thoughts of suicide and anxiety [7]. Further research is needed to distill of the cause of this high prevalence among adolescents lies in the natural psychological development of a human being or in the circumstance of living in the Caribbean and in the last case to determine the risk factors.

Studies of urban-rural differences in prevalence of mental disorders have not given consistent findings. In Australia and Northern Brazil a higher prevalence was measured in the rural areas whilst in Canada and England the reverse was observed [22], [36], [37] In the United states as in our study no significant differences were observed between the living areas [38]. The variations between rural and urban areas are probably largely dependent on other risk factors which could explain these variations observed in the various countries.

The strength of this cross-sectional study was the design with a stratified multistage cluster, adequate to represent the ethnic and geographic diversity within the Surinamese population by sex in 5 different age-groups [12] The use of trained interviewers, the inclusion of control questions in the questionnaire and the intense monitoring on consistency and completeness that included random checks on responses of participants improved the validity of our self-reported data [12]. In addition, in the analysis, sample weights were applied in the analysis to correct for selection and response bias. In general, the percentage of missing data was relatively small (<2%), except for the information on income status.

Still, some limitations should be considered. First, the Kessler scale is not a diagnostic but a screening tool which mainly focuses on anxiety and depression and not on other disorders. Second, although the wide range of confounding variables are evaluated in this study many are also missing. For example family ties, available social support systems and access to health care.

Conclusion

Overall 22.2% of respondents reported mental health disorders. The main risk factors observed were female gender, Maroon ethnicity, low level of education and income, living in urban areas, unemployment and being single. This research has taught us that further scrutiny is necessary to explore the differences in prevalence between the different ethnic groups. Further the high prevalence observed emphasizes the need for an accessible mental health system.

Competing Interests

The authors have declared that no competing interests exist.

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