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Assessment of mental suffering in a population affected by the Madeira River flood in the Brazilian Amazon

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Abstract— *Objective: to evaluate the frequency of common mental disorders (CMD) in the population affected by the Madeira River flood, in Rondônia, Brazilian Amazon. Method: This is a descriptive and cross-sectional study carried out in two stages, the first just after the flood and another 4 years later. In its first stage, 392 people were investigated, and in the second stage, 58 people of both sexes and ages ranging from 10 years (child) to 86 years (elderly). For data collection, the Self-Report-Questionnaire (SRQ – 20) was used. Results: the population exposed and affected by the flood had 64.1% of CMD, in the following order of determination: other symptoms of SRQ-20 (77.6%), decreased energy (76.3%), somatic symptom (67.8%), depressed mood (66.2%) and depressive thoughts (32.5%). After 4 years, in a reassessment, the population affected by the flood still presented 28.2% of CMD, in the following order of determination: other symptoms of SRQ-20 (45.9%), somatic symptom (33.6%), depressed mood (29.9%), decreased energy (17.8%) and depressive thoughts (13.8%), considered as important indicators of evidence of mental suffering. Conclusions: From the data collected in this study, it can be indicated that the group of people affected by the flood, regardless of gender or age group, has mental suffering that lasts for at least 4 years of the victim's life.*

Keywords— ***Common Mental Disorders – CMD; SRQ-20 instrument; Flood of the Madeira River; Rondônia; Brazil.***

I. INTRODUCTION

The floods affect more than 102 million people a year, according to the study "Disaster-resilient Societies - Facts and figures" of the United Nations Conference on Sustainable Development (UNCSD) [1] and most of the exposed populations (95%) and deaths (95%) are found in the countries with the lowest per capita income (equal to or less than US $ 3,705 per year) according to the “International Strategy for Disaster Reduction (ISDR) - Global Assessment Report on Disaster Risk Reduction -

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Risk and poverty in a changing climate Invest today for a safer tomorrow "[2]. According to Freitas, Ximenes[3] the impacts of floods are more severe for certain population groups and more vulnerable geographic spaces, whether in the poorest countries or even in the richest countries. Studies by Blashki, McMichael, Karoly[4] and Haine et al[5] report that the causes and consequences of floods, as well as responses and actions for prevention and mitigation, have become topics of great interest after countless alerts from the scientific community about the potential for changes large-scale environmental issues such as climate change.

Several studies point out social and psychological impacts as a consequence of the floods, mainly on the physical health of the individual and society in the face of a flood situation such as material losses, mortality and morbidity. According to Freng et al[6], few studies focus on the impacts on the mental and psychological health of flood victims. For these authors, the most frequent symptoms are related to psychological stress such as sleep disorders, insomnia, repetitive nightmares about the event, flashbacks, amnesia, difficulty concentrating, irritability and anger, panic attack and fear of talking about the event. Also according to these authors, the affected population may have high prevalence rates of psychological disorders such as "posttraumatic stress disorder - PTDS".

For Tapsell et al[7], psychological disorders are common in victims of disasters exposed to psychologically stressful and traumatic events and more intensely impact certain social groups such as women, residents of rural areas, illiterates, children, the elderly, the disabled and less favored classes. They were found by Tapsell et al[7]; Euripidou, Murray[8], and Fundter et al[9] after floods, cases of depression, increased levels of anxiety in those affected, loss of appetite, shortness of breath, fatigue and dizziness. Kovats[10] adds that women may be more burdened due to the fact that they take responsibility for the health care of their family, adding to this specific group another stressor.

Tapsell et al[7] states that breaking the daily routine of family and social life also generates psychological impacts on those affected and that flood victims have a feeling of helplessness and helplessness in relation to the flood and that all these stresses and traumas can last for months or years after the floods. For Keim[11], those affected by the floods still present abuse of chemical substances - drugs and alcohol, family violence and behavioral disorders in children.

In Brazil, recently some environmental disasters and their consequent psychological damage have been widely reported by the Brazilian press. The rupture of the dam of the mining company Vale, in Brumadinho, as occurred in 2015 with the rupture of the Fundão dam, in Mariana, caused damage to the mental health of the victims - who lost family members - and even those who left their homes and personal objects destroyed by the mud. In 2017, the team from the Vulnerabilities and Health Research Center (NaVeS) at the Federal University of Minas Gerais (UFMG) conducted a survey among the victims of Mariana. The project "Research on the Mental Health of Families Affected by the Disruption of the Fundão Dam in Mariana (Prismma)" heard 271 victims, between 13 and 90 years of age. The study revealed that 28.9% of respondents suffered from depression, a rate five times higher than that described by the World Health Organization (WHO) for Brazil in 2015. The suicidal behavior among those affected by the Fundão dam breach also generated an alert: 16.4% of respondents reported the risk. The survey also identified the predominance of Post Traumatic Stress Disorder (PTSD), seen in 12% of the affected population. Leite, Sttefens[12] identified the Post-Traumatic Stress Disorder (PTSD) pathology in the population affected by the flood in the municipality of Maravilha in Santa Catarina. According to DSM-513, the essential feature of Posttraumatic Stress Disorder is the development of characteristic symptoms after exposure to one or more traumatic events. People's mental health can be profoundly affected when a disaster occurs, such as a flood that directly and / or indirectly affects a more exposed and vulnerable population group.

In Porto Velho, capital of the state of Rondônia, Brazilian Amazon, at the end of 2014, the gradual rise in the level of the Madeira River produced important consequences for the region's socio-spatial dynamics, whether in urban or rural areas. In Rondônia, more than 6 thousand families were directly affected in 10 municipalities, which is equivalent to approximately 30 thousand people. It is estimated that 97,000 people were affected in some way by the 2014 disaster across the state, according to the State and Municipal Civil Defense. A total loss of R $ 4.2 billion was estimated as a result of the natural disaster, which led the state government to draw up a reconstruction plan[14]. França and Mendonça[14] analyzed the risks and the occurrence of diseases associated with flooding during the period of the Madeira River flood. The direct contact of the population with contaminated water and the lack of basic sanitation in the region have had an impact on the mental and psychological health of flood victims.

Paraguassú-Chaves[15] when researching the consequences of the 2014 Madeira River flood caused on the health of the affected population, from the International Classification of Diseases - CID found a high incidence of cases of infectious and parasitic diseases such as diarrhea and gastroenteritis, fever typhoid, malaria, dengue,

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leptospirosis, shiguelose, eschecichia coli, giardiasis. Malnutrition was the disease that best represented endocrine, nutritional and metabolic diseases (Chapter IV CID). Eye diseases and appendages (Chapter VII ICD) identified an outbreak of conjunctivitis. High blood pressure in the group of diseases of the circulatory system (Cap. IX ICD). Allergic rhinitis, acute respiratory infections, severe sinusitis, asthma, lung infections, laryngitis among others in the group of diseases of the respiratory system (Cap. X ICD). Dermatitis and skin rashes in the group of diseases of the skin and subcutaneous tissue (chap. XII ICD). Muscle strains in the group of diseases of the musculoskeletal system and connective tissue (chap. XIII ICD). Kidney infections in the group of diseases of the genitourinary system (Chapter XIV CID). In the group of diseases, injuries, poisoning and some other consequences of external causes (Cap. XIX CID), asphyxia, intoxication and poisoning, hypothermia, injuries, traumas, cuts, lacerations and injuries were diagnosed in the municipal health units. In the group of diseases external causes of morbidity and mortality (Chap. XX CID), domestic violence increased considerably, in addition to electric shocks, drownings and falls among the population affected by the flood.

What most attracted attention in the research by Paraguassú-Chaves[15] was the state of mental health of the population exposed to the flood, which the researcher called invisible diseases. In the disorders and diseases of the group of mental and behavioral disorders (Chap. V CID) Paraguassú-Chaves, he identified high rates of cases of post-traumatic stress states, adaptation disorder, non-organic sleep disorder, insomnia, nightmares and memories repeated on the event, amnesia, difficulty concentrating, irritability and anger, phobia, anxiety and panic, depression, loss of appetite, fatigue, dizziness, increased consumption of alcohol and medication, behavioral and emotional disorders in children and the elderly. There was a manifestation of ulcer development. What is still observed is an inefficiency of the public health service to prioritize the indispensable assistance to treat these neglected pathologies.

In view of the scenario presented by Paraguassú-Chaves[15], a survey was carried out in the first stage with a group of 392 victims of the Madeira River flood, which occurred in 2014 and in the second stage, 4 years after the event, with a sample group of 58 affected people due to the flood and which have already been submitted to assessment in the first stage of the research, based on the following problems: a) What is the level of mental suffering of the victims of the Madeira River flood immediately after the environmental and social disaster ?. b) What is the level of mental suffering of these victims 4 years after the flood? With a view to the problems presented, the present study was carried out to analyze the level of the level of mental suffering using the SRQ-20, which is the 20-item version of SRQ-30 for tracking non-psychotic mental disorders.

II. METHOD

It is a descriptive study, with a quantitative approach, of a type characterized as epidemiological, whose model is transversal, which consists of a cut in the historical flow of the event, in which the exhibition is observed simultaneously, carried out with a group of people victimized by the Madeira River flood, in Rondônia, Brazilian Amazon.

As an instrument of data collection, an adapted version of the Self-Reporting Questionnaire (SRQ-20) was used, originally developed by Harding et al[16] - "Mental disorders in primary health care: a study of their frequency and diagnosis in four developing countries ", Already validated in several countries, according to World Health Organization[17] -" A user's guide to the Self Reporting Questionnaire "and Husain, Creed, Tomenson[18] -" Depression and social stress in Pakistan "and in Brazil by Lima et al[19] -" Stressful life events and minor psychiatric disorders: an estimate of the population attributable fraction in a Brazilian community-based study ", Mari[20] -" Psychiatric morbidity in three primary medical care clinics in the city of São Paulo: issues on the mental health of the urban poor ", Gonçalves, Stein, Kapczinski[21] - "Performance evaluation of the Self-Reporting Questionnaire as a psychiatric screening instrument: a comparative study with the Structured Clinical Interview for DSM-IV-TR ". Data collections were performed with an average filling time of 30 minutes, under the guidance of a senior researcher. Mental distress was assessed using 20 variables, with the response scale consisting of yes or no.

The questionnaire consists of 20 yes / no questions, four of which are about physical symptoms and 16 about psycho-emotional disorders. Initially, the cut-off score of the SRQ-20 for this study was set at 7/8. The scores obtained are related to the probability of the presence of non-psychotic disorder, ranging from 0 (no probability) to 20 (extreme probability). SRQ-20 is recommended by WHO for community studies and primary health care, especially in developing countries. This instrument has been used in several countries of different cultures to screen for non-psychotic disorders.

The categorization was carried out by 5 factors, being addressed in the factor analysis 1 - decreased energy consisting of 6 variables: (feels tired all the time; gets tired easily; finds difficulties in making decisions; finds difficulties in carrying out with satisfaction with their daily

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activities, difficulties in thinking clearly, difficulties in service - their work is painful, causes them suffering.

Next, there are the variables of the factor analysis 2 - somatic symptoms, composed of 4 variables, being: (you have a headache frequently, you have an unpleasant feeling in your stomach, you have poor digestion, you have a lack of appetite).

Regarding the variables of factor analysis 3 - depressed mood, 3 variables appear, being: (feels nervous, tense or worried, has been feeling sad lately, has been crying more than usual).

And in the factor analysis 4 about depressive thoughts - it consists of 4 variables, being: (he has lost interest in things, he is unable to play a useful role in his life, he feels like a useless person, without help, he has an idea of end life).

Finally, factor 5 organized from other symptoms of the SRQ-20, with 3 variables: (sleeps poorly, gets scared easily, has hand tremors).

Mental suffering was assessed by the sum of the variables presented in the SRQ-20, considering as cut-off point 7 or more affirmative answers to the 20 questions presented. For the representation of the data, the absolute frequency (AF) and the relative frequency (RF) of each listed variable were calculated.

The research in its first phase was carried out in the provisional shelter (type military campanile located in the Parque de Exposição Agropecuária de Porto Velho, where part of the population victimized by the flood was housed. In the second phase of the research, the subjects (individuals) were interviewed in their new home addresses. The inclusion criteria were people who expressed a voluntary interest in participating in the research and who signed the free and informed consent form if an adult or the parents signed the term when it came to children. according to the ethical aspects provided for in Resolution 196/96 of the National Health Council of Brazil, it was forwarded and duly approved by the Research Ethics Committee of the College Faema. In the second phase, the work had its limitations regarding the sample universe due difficulties in locating the same individuals who participated in the research in the first step, several attempts were made to locate and identify individuals after the suffering of the 2014 flood tragedy. The relocation and relocation census was used to locate the new addresses of the target population of the research.

III. RESULTS AND DISCUSSION

3.1. Results of the SQR-20 applied in 2015 after the flooding of the Madeira River, Rondônia, Brazilian Amazon

The data on mental suffering are presented according to the classification of Iacoponi & Mari[22], in a sequenced manner, with adaptation for this research. Factor 1, decreased energy; Factor 2, somatic symptoms; Factor 3, depressed mood; Factor 4, depressive thoughts and Factor 5, other symptoms of SRQ-20.

392 volunteers participated in this research, all of whom were victims of the 2014 Madeira River flood and were in temporary shelter, with 230 (58.7%) female and 162 (41.3%) male, with ages varying from 10 to 86 years (average of 53 years). In the second stage of the research, 4 years after (2019) the first stage, 58 volunteers of both genders / genders participated, 26 (44.8%) of whom were female and aged between 20 and 70 years.

Tables 1, 2, 3, 4 and 5 show the absolute and relative frequencies of the responses to the SQR-20 instrument referring to a survey conducted in 2015 right after the environmental disaster (Madeira River flood).

Table 1 presents the data in relation to factor 1. Decreased energy, with greater frequency in the variables “Finds difficulties to carry out your daily activities with satisfaction” with 89.5%, then with 86.7% “Have difficulties to think clearly” ; “Finds difficulties in making decisions” with 84.7%. The variables “You have difficulties in the service (your work is painful, it causes you suffering) with 67.1%,“ You feel tired all the time and “You get tired easily” with 64.8% also present with very high frequencies . The average Energy Decrease Fact was 76.3%.

Table 1.Frequency related to Factor 1 - Decrease in Vital Energy.

QUESTIONS	Yes	%	No	%
Do you feel tired all the time?	254	64.8	138	35.2
Do you get tired easily?	254	64.8	138	35.2
Do you find it difficult to make decisions?	332	84.7	60	15.3
Do you find it difficult to carry out your daily activities with satisfaction?	351	89.5	41	10.5
Do you have trouble thinking clearly?	340	86.7	52	13.3
Do you have difficulties in service (is your	263	67.1	129	32.9

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work painful, does it cause you suffering?)				

In factor 2 (table 2), the frequency of somatic symptom had its highest index in the variable "Has headaches frequently" with 74.0%, followed by the variables "Has poor digestion" with 68.6%, "Has unpleasant feelings in the stomach" with 66.0% and "There is a lack of appetite with 62.4%. The average of the Somatic Symptom Factor was 67.8%.

Table 2. Frequency related to Factor 2 - Somatic Symptom

QUESTIONS	YES	%	NO	%
Do you have headaches often?	290	74.0	102	26.0
Do you have unpleasant feelings in your stomach?	258	66.0	134	34.0
Do you have poor digestion?	269	68.6	123	31.4
Do you have a lack of appetite?	245	62.5	147	37.5

In factor 3 (table 3), depressed mood, the most frequent was the variable "Have you been feeling sad lately", with 82.9%, followed by the variable "Do you feel nervous or tense, worried" with 75.5%. The lowest frequency was found in the variable "You have been crying more than usual", with 40.3%. The average Depressive Mood Factor was 66.2%.

Table 3. Frequency related to Factor 3 - Depressive Mood

QUESTIONS	YES	%	NO	%
Do you feel nervous or tense or worried?	296	75.5	96	24.5
Have you been feeling sad lately?	325	82.9	67	17.1
Have you been crying more than usual?	158	40.3	234	59.7

In factor 4 (table 4), with regard to depressive thinking, the variable "Has lost interest in things" predominates with 70.7%. "He is unable to play a useful role in his life" with 33.2% was the second highest frequency found. The variables "You feel like a useless person, without help" with 16.8% and "You have an idea of ending your life" with 9.4% were the lowest frequencies found, however, with important indicators for a deeper assessment of the problem. The average of the Depressive Thoughts Factor was 32.5%.

Table 4. Frequency related to Factor 4 - Depressive Thoughts

QUESTIONS	YES	%	NO	%
Have you lost interest in things?	277	70.7	115	29.3
Are you unable to play a useful role in your life?	130	33.2	262	66.8
Do you feel like a useless person, without help?	66	16.8	326	83.2
Do you have any idea of ending your life?	37	9.4	355	90.6

In the variable Other Symptoms of the SQR-20, the frequencies found should be considered as important and very sensitive. "Sleeps badly" with 82.9% and "Scares easily" with 80.2%, with figures above 80.0%. Another important variable is "You have tremors in your hands" with 69.1%. The SRQ-20 Other Symptom Factor average was 77.63%.

Table 5. Frequency related to Factor 5 - Other Symptoms of SRQ-20

QUESTIONS	YES	%	NO	%
Do you sleep badly?	325	82.9	67	17.1
Are you scared easily?	317	80.9	75	19.1
Do you have tremors in your hands?	271	69.1	121	30.9

3.2. Results of the SQR-20 applied in 2019, 4 years after the 2014 Madeira River flood

After 4 years of the first phase of the research, 58 volunteers participated in the second phase (14.8% of the total number of subjects in the initial phase of the research), all of whom were victims of the 2014 Madeira River flood, 26 (44.8%) of whom female and 32, with ages varying from 20 to 70 years old (average of 55 years old).

Table 6 presents a summary of all factors evaluated in this second stage of the study.

In factor 1 - decreased energy, the highest relative frequencies were found in the variables "You have difficulties in the service (your work is painful, it causes you suffering) with 25.9% and "You find it difficult to carry out your daily activities with satisfaction" with 24.1%. The variables "You feel tired all the time" and "You get tired easily" obtained the same values with 15.5%. The lowest results were found in "You have difficulty thinking clearly" with 13.8% and "You find it difficult to make decisions" with 12.1%. The average Energy Decrease Fact was 17.8%.

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In factor 2 - somatic symptom, the highest frequency was found in the variable "You have headaches frequently" with 41.4%; followed by the variables "Has an unpleasant feeling in the stomach" with 36.2%, "Has poor digestion" with 32.8%. The lowest frequency found was in "You have no appetite" with 24.1%. The average of the Somatic Symptom Factor was 33.6%.

In factor 3 - depressed mood, the highest relative frequency was with the variable "Have you been feeling sad lately", with 34.5%, followed by the variable "Do you feel nervous, tense or worried" with 31.0%. The lowest frequency was found in the variable "You have been crying more than usual", with 24.1%. The average of the Depressive Humor Factor was 29.9%. With regard to Depressive Thinking, the variable "Has lost interest in things" predominates with 25.9%. "You are unable to play a useful role in your life" and "You feel like a useless person, without help" with 10.4% and, "You have an idea of ending your life" with 8.6% were the lowest frequencies found, however, with important indicators for a deeper assessment of the problem. The average of the Depressive Thoughts Factor was 13.8%. "Sleeps badly" with 56.9%, "Scares easily" with 53.4% and "Has hand tremors" with 27.6%, are the relative frequencies of other symptoms of the SQR-20 that must be considered important and very sensitive. The SRQ-20 Other Symptom Factor average was 45.9%.

Table 6. Absolute and relative frequency of all Factors assessed in the second stage of the study (4 years after the first assessment)

Factor 1 - Decrease in Vital Energy	**YES**	**%**	**NO**	**%**
Do you feel tired all the time?	9	15.5	49	84.5
Do you get tired easily?	9	15.5	49	84.5
Do you find it difficult to make decisions?	7	12.1	51	87.9
Do you find it difficult to carry out your daily activities with satisfaction?	14	24.1	44	75.9
Do you have trouble thinking clearly?	8	13.8	50	86.2
Do you have difficulties in the service (is your work painful, does it cause you suffering?)	15	25.9	43	74.1
Factor 2 - Somatic Symptom				
Do you have headaches often?	24	41.4	34	58.6
Do you have unpleasant feelings in your stomach?	21	36.2	37	63.8
Do you have poor digestion?	19	32.8	39	67.2
Do you have a lack of appetite?	14	24.1	44	75.9
Factor 3 - Depressive Mood				
Do you feel nervous or tense or worried?	18	31.0	40	69.0
Have you been feeling sad lately?	20	34.5	38	65.5
Have you been crying more than usual?	14	24.1	44	75.9
Factor 4 - Depressive Thoughts				
Have you lost interest in things?	15	25.9	43	74.1
Are you unable to play a useful role in your life?	6	10.4	52	89.6
Do you feel like a useless person, without help?	6	10.4	52	89.6
Do you have any idea of ending your life?	5	8.6	53	91.4
Factor 5 - Other Symptoms of SRQ-20				
Do you sleep badly?	33	56.9	25	43.1
Are you scared easily?	31	53.4	27	46.6
Do you have tremors in your hands?	16	27.6	42	72.4

The SRQ-20 was applied to 450 affected by the flood, victims who were in the temporary shelter with an average relative frequency of 48.25 in males and 51.75% in females. There was a relative equivalence in the

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distribution of sex in the average of the two stages of the research (Table 7). In the period in which those affected were in the temporary shelter, the application of SRQ-20 was more frequent in women, because women were more concentrated in domestic services, caring for the few material and sentimental goods left over and caring for children (children and grandchildren).

Table 7. Distribution of the population affected by the flood by sex in the two stages of the survey.

GENDER	**Male**	**%**	**Female**	**%**
First stage	162	41.3	230	58.7
Second stage	32	55.2	26	44.8
Average by gender	97	48.25	128	51.75

There was a predominance of the population in the adult age range from 41 to 60 years with 58.9% (Table 8). The second highest concentration of respondents occurred in the age group 21 to 40 years old. It can be verified that the target population for the application of the SRQ-20 was concentrated in the adult population. The children were submitted to the questionnaire voluntarily, with their own manifestation to participate in the research and with the consent of their parents or guardians. The children shaken by the event and every change in routine and situation they were in asked to speak, express themselves in whatever way they were going through.

Table 8. Distribution of the population affected by the flood by age group in the research stages.

Age Range	**10 to 20**	**21 to 40**	**41 to 60**	**+ 60**
First stage	27	71	259	35
Relative frequency	6.9	18.1	66.1	8.9
Second stage	0	22	30	6
Relative frequency	0.0	37.9	51.7	10.4
Average years	3.45	28.0	58.9	9.65

The population that directly suffered from the effects of the Madeira River flood, in Rondônia, Brazilian Amazon, which were assessed by applying the Self-Reporting-Questionnaire, SRQ-20 shortly after the environmental disaster, presented 64.1% with minor mental disorders (currently called mental disorders) common - CMD), in the following order of determination: other symptoms (77.6), decreased energy (76.3), somatic symptom (67.8), depressed mood (66.2%) and depressive thoughts (32.5%). In the second phase of the research, 4 years after the tragedy, the population submitted to the evaluation presented 28.2% with minor psychological disorders, in the following order of determination: other symptoms (45.9), somatic symptom (33.6), depressed mood (29.9%), decrease of energy (17.8) and depressive thoughts (13.8%).

Table 9 - Comparison of the TMC after the flood and after 4 years.

TCM	Relative Frequency (%)	TCM	Relative Frequency (%)	Difference (%)
After the flood	64.1	Four years after the flood	28.2	35.9
Factor 1	76.3	Factor 1	17.8	58.5
Factor 2	67.8	Factor 2	33.6	31.2
Factor 3	66.2	Factor 3	29.9	36.3
Factor 4	32.5	Factor 4	13.8	18.7
Factor 5	77.6	Factor 5	45.9	31.7

A mental health survey that interviewed 271 people affected by the Samarco Fundão dam burst in Mariana, in the central region of Minas Gerais, Brazil, found that 12% of those affected by the disaster suffer from post-traumatic stress. Among children and adolescents, the rate is higher, reaching 83%.

The experience of the disaster and the memories impact on the routine of these people, who presented depression, anxiety, insomnia, increased cardiovascular problems and suicidal thoughts, after more than two years of the tragedy, considered the greatest in the country.

"Anxiety disorder is a perception of constant restlessness. In post-traumatic stress, these people keep dreaming, from time to time they have flashbacks of what happened and this causes great stress "[23]. According to the survey, depression affects almost 30% of victims. Among children and adolescents, the incidence is 39%. The study states that anxiety among victims is greater than the standards identified in Brazil by the World Health Organization (WHO). A high prevalence of psychiatric mental disorders related to stress and depression was observed, five times

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higher than the Brazilian population assessed by the World Health Organization.

Depression, excessive alcohol consumption, post-traumatic stress and even suicide are some of the consequences that can affect people in situations of major humanitarian crisis, as was the case of the rupture of dam 1 of the Córrego do Feijão complex, in Brumadinho. For Leite[24], in these situations the focus should also be directed to mental health care. "We say little and there is no culture of spreading the psychosocial sequelae that remain in the people around us. The psychological impact of the affected people can extend up to 15 years after the traumatic events. "Mental health problems generate incapacity for work, worsening quality of life, impoverishment and impairment in personal and family relationships, in addition to early mortality". In our study, mental disorders such as depression, generalized anxiety disorder, post-traumatic stress disorder, suicide risk and substance use disorders were evaluated. Self-reported depression was 15% before the tragedy. However, the diagnosis now corresponds to twice that, that is, about 30% of the victims have a depressive condition. This number is five times higher than the average for Brazil, according to data from the World Health Organization (WHO) 2015. Already generalized anxiety disorder was diagnosed in 32% of respondents, a prevalence three times higher than the Brazilian average.

Another worrying data refers to the risk of suicide in this population: it was found in 16.4% of respondents. To obtain this index, those affected had to answer "yes" to at least one of the questions that evaluated this topic - for example, having already thought, planned or attempted suicide at some point in their lives. "The number is quite high." According to the study, 4.4% of those affected interviewed had planned suicide in the 30 days prior to the survey.

In the first stage of this research in the factor of decreased vital energy, all frequencies are extremely high and worrying about the 76.3% average. This group of people affected by the flood "Finds difficulties to carry out their daily activities with satisfaction", "Has difficulties to think clearly", "Has difficulties to make decisions", "Has difficulties in the service (his work is painful, it causes him suffering), "Feeling tired all the time and "You get tired easily". After 4 years of trauma, the average found for factor 1 has an average of 17.8%, still considered high. The most important and persistent relative frequencies were found in "You have difficulties in the service (your work is painful, it causes you suffering) and "You find it difficult to carry out your daily activities with satisfaction". However, all variables are considered important in this analysis.

In the first stage of the research, factor 2, the relative frequency of the somatic symptom, had its highest index the variable "You have headaches frequently", "You have poor digestion", "You have unpleasant feelings in your stomach" and "You have a lack of appetite". The average of the Somatic Symptom Factor was 67.8%. After 4 years, those affected by the flood continue with high frequency in the somatic sector, having been found at higher frequencies in decreasing order "You have headaches frequently", "You have an unpleasant feeling in your stomach", "You have poor digestion" and "You lack appetite". The average of the Somatic Symptom Factor was 33.6%. The victimized population continues to suffer from disorders related to somatic symptoms.

With an average of 66.2%, the depressive mood factor also had a great negative impact on this population affected by the flood, with the highest frequency "Have you been feeling sad lately", followed by the variable "Do you feel nervous, tense or worried". With an average of 29.9% in the depressive mood factor, 4 years after the event, the highest relative frequency was with the variable "Have you been feeling sad lately", followed by the variable "Do you feel nervous, tense or worried". The lowest frequency was found in the variable "You have been crying more than usual".

With an average of 32.5% with regard to depressive thoughts "He has lost interest in things" predominated, followed by "He is unable to play a useful role in his life". Striking frequencies were found that demonstrate the level of suffering of these people, such as "You feel like a useless person, without help" with 16.8% and "You have an idea to end your life" with 9.4%. In the time of 4 years after the event, the population affected by the flood show depressive thoughts in the order of 13.8%, having predominated the issue of having lost interest in things, they are unable to play a useful role in their life. He has the idea of ending his own life and remains at 8.6% of the population.

The other symptoms raised by the SRQ-20 with an average of 77.6% are extremely sensitive, in decreasing order in the variables "Sleeps badly" with 82.9% and "Scares easily" with 80.2% and "Has hand tremors" with 69.1%. Despite the difference in values between the two stages of the research, 4 years after the flood of the Madeira River, the exposed population continues with the other symptoms of the SRQ-20 high, such as sleeping poorly with 56.9% and being easily frightened by 53.4%.

The young and adult women evaluated by the SRQ-20 presented their responses more concentrated in Factor 1, in the variables "Feels tired all the time (in a feeling of helplessness)," You get tired easily "(because you are lost, aimless, without direction), "Finds difficulties in making

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decisions" (the omission, neglect and inefficiency of the public power leaves us with no hope of what to do), "Finds difficulties in carrying out their daily activities with satisfaction" (the sudden change of life, without a home, without the place won with so much effort, makes us very sad), "Finds difficulties to think clearly" (we don't know what to do. Uncertainty left everyone without believing in anything else), "You have difficulties in the service" (the drastic change in life directly affected the performance at work. It cannot be what it was before. Very difficult).

The somatic symptoms "Headaches daily", "The unpleasant feelings in the stomach, poor digestion and lack of appetite" were concentrated in women. Regarding the depressive mood factor, in women there was a predominance of crying more than usual and feeling sadder lately. Women showed disinterest in things (depressive thoughts). They sleep poorly, are easily frightened and have hand tremors were the highest frequencies in other symptoms of the SRQ-20.

In young men and adults submitted to the SRQ-20, their responses were more concentrated in the two stages of the research in the variables "They sleep poorly", "They are easily alarmed" and "You have tremors in your hands" (other symptoms of the SRQ-20). They presented unpleasant feelings in the stomach, poor digestion and lack of appetite (somatic symptom), have difficulties in making decisions, have difficulties in thinking clearly and find difficulties to carry out their daily activities with satisfaction and still have difficulties in service (decreased energy) . In the depressive mood factor, young men and adults showed a concentration in "Do you feel nervous (a) tense (a) or worried" and have been feeling sad lately. The variable "You have lost interest in things" predominated in the depressive thoughts factor. A fact that moves and scares is the demonstration in "Having the idea of ending life". The depressive mood factor was the most important finding in children. "Feeling nervous or tense or worried," Have you been feeling sad lately "and" Have you been crying more than usual ". Other important findings are found in the depressive thoughts factor "You have lost interest in things", in the factor other symptoms of the SRQ-20 "You sleep badly" and "You get scared easily", in the energy decrease factor "You find it difficult to do your daily activities with satisfaction" and "you have difficulties to think clearly". It is not to be frightened by the results found. George25 points out and discusses the impacts on the mental health of those affected by a situation similar to the research carried out in Rondônia, Brazil.

Bich et al[26]; Seto et al[27]; Warraich, Zaidi, Patel[28]; Vineis[29] are some authors who indicate that populations exposed to floods have emotional sequelae and worsening of the state of post-traumatic stress. Studies by Kovats10; Tapsel et al7 found adaptation disorders with percentages between 10% to 25% in individuals exposed to the flood, affecting women, rural dwellers, illiterates, children, the elderly, the disabled and the poorest more intensely, in agreement with what is observed in the present study. The findings by Feng et al6; Vineis29 on disorders and syndromes resulting from emotional factors, mainly as sleep disorders, insomnia, nightmares and repeated memories about the event, amnesia, difficulty concentrating, irritability, anger and anxiety are references that can and should be considered when interpreting the results of our research. In other important studies that deal with mental suffering in those affected by floods are those by Warraich, Zaidi, Patel28; Paranjothy et al30; Vineis29, phobias, panic and depression were observed. Fundter et al9; Kovats10 have already pointed out that loss of appetite, fatigue and dizziness are common symptoms after a flood. The attempt to take one's own life and suicide is addressed by Vineis29 in "Climate change and the diversity of its health effects". Tapsell et al7 affirm that emotional disorders are manifested in the population exposed during floods, after and during a short period. There is confirmation of mental suffering in the exposed population when there is a break in the family and social routine, according to Greenough et al31; Kovats10. Studies point to other consequences on mental and emotional health in exposed populations, such as family violence and abuse of alcohol and medication consumption among adults (Tapsell et al7; Keim11). Vineis29 in his study points to behavioral disorders in children and young girls exposed to mental and sexual harassment in temporary shelters. For Tapsel et al7, the mental and emotional consequences of this exposed population can last for a long period, and can remain until the end of the person's life.

According to Guirado, Pereira[32] the SRQ-20 screening instrument, designed to detect symptoms, is useful for measuring the level of suspicion (presence / absence) of mental disorder and achieves relevant action aimed at primary levels of care, which can identify symptoms associated with CMD. The results obtained in the present study corroborate this statement.

IV. CONCLUSIONS

The study covered people aged 10 (child) to 86 years (elderly), in the first stage and only young adults (20 years) to 70 years in the second stage. 392 and 58 affected, respectively, participated in the two stages of the research. There was an equivalence regarding the representation of

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sex, with an average of 51.7% for women and 48.7% for men. Regarding the age variable, the manifestations evidenced by the SRQ-20 occurred at all ages, with a more prominent proportion in the age group between 20 and 60 years. The group of people affected by the Madeira River flood presented 64.1% of Common Mental Disorders - CMD, in the following order of determination: other symptoms (77.6%), decreased energy (76.3%), somatic symptom (67.8%), depressed mood (66.2%) and depressive thoughts (32.5%), all considered as indicators of evidence of mental suffering. After 4 years this same group of people presented 35.9% TCM in the following order of determination: other symptoms (45.9%), somatic symptom (33.6%), depressed mood (29.9%), decreased energy (17.8%) and depressed thoughts (13.8%), all considered as indicators of evidence of mental suffering. Therefore, the mental suffering observed in this population is of long duration. Additionally, the SRQ-20, easy to handle and validated in Brazil, proved to be an instrument with acceptable performance to assess CMD in this studied population. Despite covering a variety of emotional disorders, the SRQ-20 is an instrument capable of identifying indispensable variables for tracking the mental health of vulnerable population groups, receptive and exposed to the situation of risk.

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