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Posttraumatic stress disorder (PTSD) as a result of the 1997 flood – incidence and clinical picture

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Summary

In this paper the incidence and the course of flood-related PTSD in the rural population of the southwest part of Poland will be presented. To serve this purpose, four villages located in the Nysa Klodzka basin were chosen. In 1997 these locations were devastated by the disaster unexpectedly and in considerable degree.

The study included 97 eyewitnesses of the flood who had never had any need to seek psychiatric help before the disaster and who had not reported any other significant stressful life events which could have been accounted for the PTSD. The intensity, risk and duration of trauma for all subjects were the same. None had received any psychological or psychiatric support after the flood.

The examination took place 60-63 months after the event and was conducted by one trained psychiatrist at the homes of those affected after prior phone appointment. The interview was based on the Composite International Diagnostic Interview (CIDI), section A (sociodemographic data) and section N (PTSD symptoms).

PTSD was diagnosed in 30.9% of those interviewed. Individuals displaying PTSD symptoms were mainly unemployed (39.2% of unemployed individuals had PTSD), with low educational level (42.9% of subjects with primary education had PTSD) and older. Men were more often affected (39.5%) than women (25.4%) and it proved to be associated with their low level of education and poverty. In 15.5% of those interviewed fully developed PTSD was still present 60-63 months after the flood.

The characteristics and patterns of PTSD occurrence observed in the examined population are in concordance with world literature. Low level of education and low economic status of men could account for the high rate of PTSD diagnosis in this group rather than in women. None of the examined subjects confirmed having had short-lasting (less than a month) symptoms which precluded the diagnosis of acute stress reaction. This was probably due to the durability of the devastation caused by the flood and prolonged exposure to a chronic stressor.

Key words: PTSD, flood, CIDI

Introduction

The nineties of the Twentieth Century are marked with an extensive research on effects of traumas caused by disasters. PTSD is claimed to be the most often

diagnosed disorder related to trauma and is thought to be quite persistent because sometimes it holds for many years [1]. The frequency of PTSD being a psychological reaction to the natural disaster depends on the time that has passed since the trauma occurred, the extent of the disaster and the methodology employed in the research [2]. Binding classification systems such as ICD-10 and DSM-IV assume that PTSD results from an exceptionally threatening or catastrophic event – an extreme stressor. The description of the stressor given in ICD-10 (situation of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone) is much closer to that presented in DSM-III-R. Unlike its predecessor, DSM-IV states that traumatic event denotes the situation endangering one's life or possibly causing serious body damage or breach in one's physical integrity. Therefore, according to ICD-10, natural disasters could be regarded as a cause of PTSD, but in DSM-IV they could be viewed as such only when the life of those affected had been endangered. It has been proven that PTSD more often accompanies disasters caused by man. Long-term studies on the psychological effects of the Buffalo Creek flood showed that two years after the catastrophe 44% of the examined population suffered from clinical symptoms of PTSD and 14 years after the disaster 28% still displayed the PTSD symptoms [3]. Researches point to the fact that in a population at high risk of profound stress 10 to 20% of individuals eventually develop PTSD whereas in the general population this percentage is lower ranging between 3 to 7.8% [4, 5]. However, the extent of the primary stressor is not the only factor associated with psychological consequences of natural disasters since these consequences are also associated with secondary stressors such as material losses, loss of one's house [6-10], death of family members or close friends [6]. It appears that the persistence of symptoms of posttraumatic stress disorder largely depends on the psychological and psychiatric support victims receive afterwards [11]. It is appraised that fully developed PTSD in victims who had no professional counselling lasts on average for 64 months and for those who were helped it holds for 36 months [5]. Moreover, social support and the support authorities provide are seen as important factors ameliorating victims' mental state [10]. Apart from the stressor itself, other factors increasing the risk of PTSD are: being a woman, low education, low economic status [12, 13], traumatic experiences from childhood, previous PTSD episodes evoked by independent stressors, presence of anxiety and depressive disorders in close relatives, no family and social support [10, 14].

Flood is one of these natural disasters, which leave behind the largest damages in personal and public property. It endangers the life and health of people, disorganises everyday life and is the source of dreadful cognitions, which may cause the PTSD. The flood Poland had suffered in July 1997 was the largest natural catastrophe ever recorded in its history. The middle and upper basin of the Odra River was particularly badly affected. Heavy raining which led to the flood lasted continuously for 5 days (5-9th of July 1997). The rainfall reached locally 500 mm and that was three-fourfold as much as the mean monthly sums for the region. As a result the water levels in rivers rose rapidly and that was facilitated by the fact that ground was already soaked up to its capacity due to recent rainfalls. In just a few nigh hours and unexpectedly 70% of

the mountain terrains of Ziemia Klodzka were flooded. Almost 80% of households located there were partly or completely destroyed. The maximal flow in some regions was so high that the estimated probability of such an event taking place was about 0.1% - therefore the flood was referred to as "millennium water" [after 15]. The analysis of flows showed that those recorded in 1997 were the highest ever observed there. The hydrologic reports on the day before the flood suggested no danger whatsoever. In the Nysa Klodzka basin the water reservoirs were mainly filled up to their medium capacity. Water levels recorded in Bystrzyca Klodzka and Klodzko were in the upper part of the middle ranges and in other places they were in the upper part of the low ranges and lower part of the middle ranges. Despite this, the water level in the Nysa Klodzka River rose from 100 to 655 cm in five days (between 4th and 8th of July 1997); in Biala Ladecka River it rose even more: from 40 to 430 cm in just four days (between 4th and 7th of July) [16]. Such a sudden and huge water level rise, lack of alert, no time for employment of proper preventive measures and complete insufficiency of those already used determined the large extent of the catastrophe. Victims were subjected to profound stress that turned out to be responsible for numerous psychological damages amongst which, the most burdening was PTSD. Its symptoms tended to persist for many years.

This paper presents a preliminary report based on data collected by the grant of State Committee for Scientific Research No 6 P05D 080 21 titled "Prevalence of Posttraumatic Stress Disorder in victims of the 1997 flood in rural area".

Material and methods

The study was conducted in four villages in the Bystrzyca Klodzka commune in the Nysa Klodzka River basin. This river was the one that rose the quickest and in highest degree out of all the rivers of the Odra River mountain basin. The very eyewitnesses of the flood who were never treated psychiatrically in the past and never exposed to another traumatic event that could be regarded as the independent PTSD cause were invited to participate in the study.

The interviews were performed by one trained psychiatrist in the homes of those who consented to the study after prior phone appointment. Direct contact with the flood victims was made possible by the GP's who were responsible for health care of the population living in the regions devastated by the disaster. The condition stating that only subjects with the same risk for trauma, its intensity and duration would be examined has been fully satisfied (villages chosen for the study were flooded to the same extent and in a comparably short time). This condition has been dictated by the fact that PTSD incidence rates largely depend on the characteristics of the population examined. The study was performed between July and September 2002, i.e. five years after the flood.

Finally 97 individuals were interviewed, in that number were 38 men (39.2%) and 59 women (60.8%). The age ranged between 24-82 years (mean 46.92). Most of the subjects had secondary education (56.7%), 36.1% had only primary education and 7.2% reached high level of education. Little more than a half of the examined was

unemployed (52.6%), which placed these people in the lowest socioeconomic class. The striking fact was that none of the interviewed subjects received any psychological or psychiatric support after the flood and the availability of such was still poor nowadays. Also financial help offered by the local authorities was minimal despite it was much desired by the affected who had no chance for compensations from insurance companies, because they were not insured against natural disasters.

The instrument used in the study was the Munich version of Composite International Diagnostic Interview (CIDI) covering the whole lifetime of a subject. CIDI was designed especially for the purposes of psychiatric epidemiological surveys in different cultural settings performed by raters with different educational backgrounds and views on symptoms and syndromes of mental disorders, using various kinds of languages and living in different geographical areas. Polish version of the CIDI was prepared according to WHO guidelines [17]. It is a highly structured interview where all closed questions have been listed and have to be asked using exact wording. Positive answers to the questions, following the specific algorithm, lead to further questioning ascertaining or omitting additional data. Such a formula of the instrument allows its application to the individuals with different educational levels: questions are clear and simple without unnecessary idioms and colloquialisms. CIDI is widely used in epidemiological studies in psychiatry; its present version has been adjusted to the modern classification systems: DSM-IV and ICD-10 [18, 19].

Validity of the PTSD section of CIDI had been studied by L. Peters. In five centres, using independent interviews in clinical trial and in general population (n=91), the CIDI outcome was compared against the clinical examination. Results were as follows: mean κ=0.66, sensitivity κ=0.83, specificity κ=0.75 [20].

In the study presented herein two sections of CIDI were used: section A of sociodemographic data and section N dealing with PTSD symptoms. Construction of the latter section allowed not only to confirm the presence of PTSD in the examined individuals but also to analyse the course of the syndrome (CIDI enables pinpointing the onset of the symptoms, duration of the disorder and the moment the symptoms cease, therefore it is possible to determine the course of the disorder in time).

The results obtained were expressed as percentages and used to describe the study group.

Results

Based on the gathered data, PTSD was confirmed in 30 individuals (30.9% of the whole sample). Distribution of this diagnosis according to the age, educational level, socioeconomic status and sex is as follows:

1. PTSD and age: the most numerous were individuals in the age between 36-45 years (n=29). The incidence rate of PTSD in this group was more than twice as high as in the group of subjects below 35 (n=20) but 1.5 times lower than in individuals between 46-55 years of age (n=27) and almost 2 times lower than in individuals over 55 (n=21).
2. PTSD and level of education: majority of those suffering from PTSD was on the primary level of the educational system (42.9% had PTSD out of 35 persons with

primary education vs. 27.3% out of 55 persons with secondary education). Amongst those with higher education (n=7) none displayed PTSD symptoms.

3. PTSD and employment: incidence rate of PTSD in unemployed individuals (n=51) was almost twice as high as in persons gainfully employed (n=46) i.e. 39.2% vs. 21.7%.

4. PTSD and gender: PTSD was more often diagnosed in men than in women because 39.5% out of 38 men in the sample had PTSD and only 1/4th of the 59 women had this diagnosis.

Out of those fulfilling the PTSD diagnostic criteria a half has stated that the onset of symptoms took place within a week after the flood (villages were flooded in about 3 hours time at night), 40% claimed it happened within a month after the disaster. Overwhelming majority of subjects diagnosed having had PTSD (93.3%) suffered from its symptoms for much more than a year following the flood. 36.7% of those with PTSD displayed symptoms also within two weeks prior to the interview which corresponded to 11.3% of the whole investigated sample. Another 26.7% of those with PTSD had symptoms present up to 6 months before the interview (8.2% of the whole sample) and about 13.3% of the PTSD sufferers reported having had last active symptoms 2 to 4 weeks before examination (4.1% of the whole sample). For a similar number of subjects PTSD symptoms subsided over a year before the interview.

Section N of CIDI allowed the assessment of all symptoms belonging to three main symptom groups of the PTSD diagnostic criteria even when these were not met and the diagnosis was not formally justified. Out of the group of symptoms associated with intense recollections of various aspects of the stressful event, ideations of the flood which were persistent and against one's will, were most dominant (79.4% out of the 97 examined persons demonstrated this phenomenon). Nightmares about the disaster were shared by 58.7% of the interviewed. 50.5% of the examined individuals had lively sensations, as if they were going through the whole catastrophe once again. More than a half of the sample (56.7%) showed physiological reactivity when exposed to stimuli symbolising trauma. As an example most of the interviewed gave storms and rainfalls, especially those lasting longer than two days or at nights, but also TV news about floods in distant regions were mentioned. Spontaneously subsiding tachycardia and palpitations were the most frequently reported physiological symptoms. In the above mentioned situations more than a half of the sample (54.6%) felt out of balance, 38.2% felt fear and 35% felt helpless (Fig. 1).

Persistent avoidance of stimuli resembling the trauma had various forms. Most often it was the loss of interest in things and actions that used to be pleasant and attractive to one before the flood (44.3%) and the sense of no perspectives for the future (39.2%). 29.8% of the examined admitted avoiding activities and places that could possibly help recall the flood although a large majority denied avoiding people whose presence could bring painful recollections back to consciousness. They explained that this was the result of mutual help and shared losses during the disaster which brought people together and determined more positive than negative associations with the others. The sense of isolation and reluctance to engage in interpersonal relationships was experienced by 24.7% of the respondents and the emotional indifference persisting

since the flood, was reported by 16.5%. The least numerous proved to be the group of victims having experienced memory gaps associated with certain aspects of trauma (7.2%, Fig. 2).

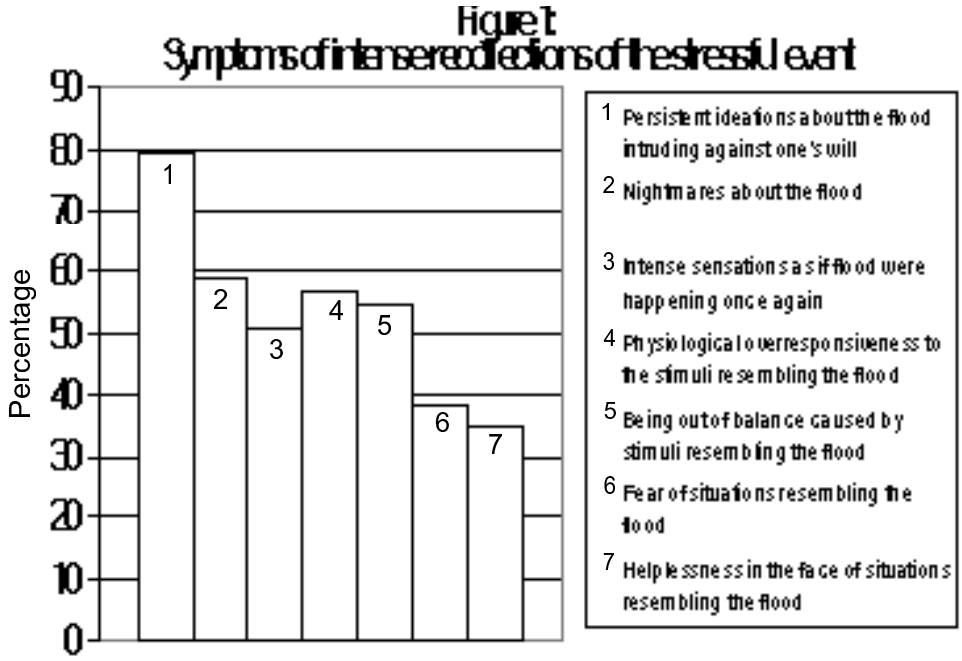
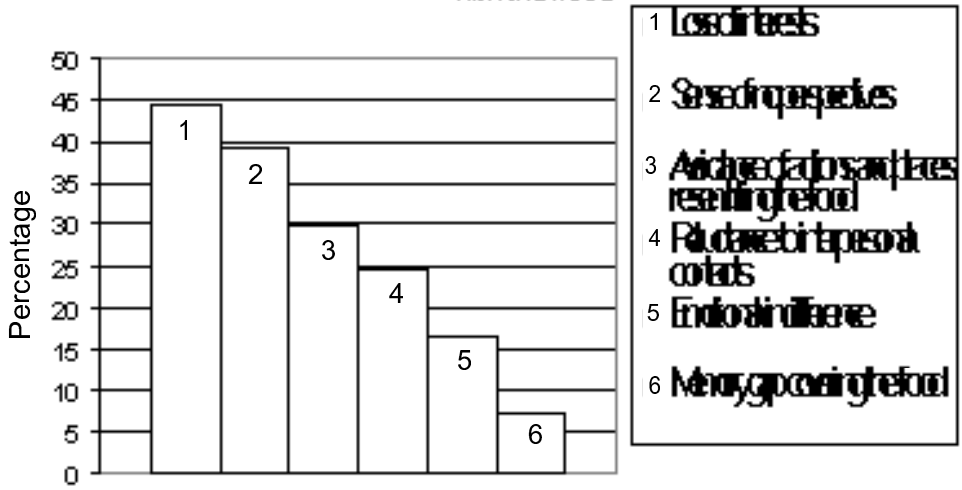
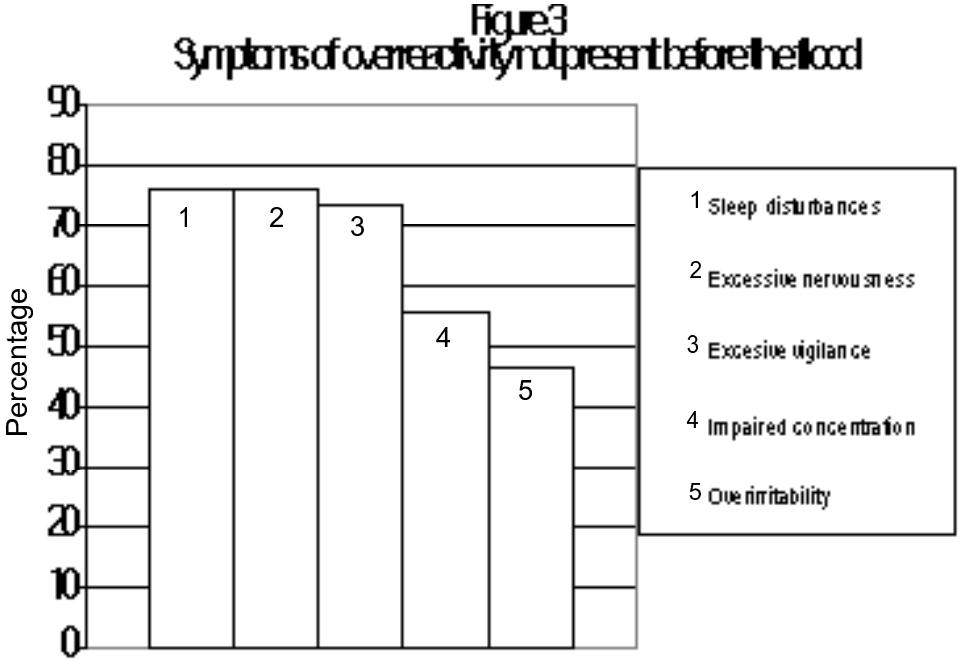


Figure 2
Symptoms of persistent avoidance of stimuli associated with the flood



In the group of symptoms resulting from over-reactivity not present before the trauma, the most frequent were sleep disturbances and excessive nervousness (76.2% each). Little less of those examined confirmed having been significantly more alerted after the flood (73.4%). Disturbed concentration was reported by 55.7% of the respondents and excessive irritability by 46.4% (Fig. 3).



Discussion and conclusions

The obtained results allowed drawing the following conclusions:

1. PTSD caused by the flood was diagnosed in 30.9% of the interviewed inhabitants living in flooded regions. The diagnosis was given more often to older and poorer persons and those with a lower level of education. This may suggest that these individuals had poorly developed defence mechanisms, were more helpless and sensed that the catastrophe and its effects were beyond their control.

2. Surprisingly, PTSD occurred more frequently in men than women. Such a discrepancy with data from literature could be attributed to low level of education and significantly higher unemployment rates of men in this study. These men clearly identified their unemployment as the main cause of their low socioeconomic status.

3. Majority of persons with PTSD suffered from its symptoms for more than a year after the flood and none of them admitted having had a short (no more than a month) duration of symptoms. The letter precluded the diagnosis of acute stress reaction and was comprehensible in the face of the fact that flood damages continued to influence the lives of those affected for the months that followed.

4. CIDI implemented in this study proved to be a useful and feasible instrument in such a case. It is easy to apply for the interviewer and understandable for the interviewee. The sequence of questions in PTSD section of CIDI allows to define the

duration of the disorder and to analyse all its symptoms individually, ultimately giving a full picture of respondents' ailments.

The study was conducted 60-63 months after the flood. PTSD was diagnosed in 30.9% of the recruited sample (n=97). This result is concordant with outcomes of other studies reported in world literature. Prospective epidemiological surveys showed that almost 1/3rd of the trauma victims with initially diagnosed PTSD still displayed its symptoms 60 months and more after the stressful event [5, 10, cited after 21]. Significant majority of those suffering from PTSD in the interviewed sample had primary education (42.9% had PTSD out of 35 persons with primary education vs. 27.3% out of 55 persons with secondary education). Literature confirms that people with lowest levels of education are more prone to PTSD [5, 10, 21].

Lack of employment was clearly identified by those studied as the main reason for their low socioeconomic status. The incidence rate of PTSD in the unemployed was twofold higher than in the group of persons with gainful employment (39.2% vs. 21.7%) and this tendency has its confirmation in other epidemiological studies suggesting sociodemographic characteristics play an important role in promoting PTSD symptoms [5, 10, 21]. It is assumed that PTSD may occur in any age and, therefore, its distribution within age groups has no statistical significance [10]. However, in this study a significant increase of incidence rates of PTSD associated with the age was reported. Analysis of such interdependent factors as age – educational level and age – employment status showed higher unemployment rate and lower level of education in older individuals and this was in agreement with the above described associations of education – PTSD and employment – PTSD.

Epidemiological surveys investigating the relationship between PTSD incidence and gender revealed in general, that women are more likely to have PTSD than men [5, 10, 21]. It was not confirmed in this study since the PTSD diagnosis was given to 39.5% of men and to 25.4% of women. However, there are papers suggesting that men indeed may develop PTSD more often than women but these references pertain to Vietnam War veterans. In one study it had been shown that 30.9% of the male veterans had PTSD versus 26.9% of the females and it seemed to be associated with the characteristics of the stressful event which, in turn, depended largely on the functions the subjects occupied during their military service [after 22]. In the presented study the fact that PTSD was diagnosed mainly in men could be probably explained by their sociodemographic characteristics such as education and employment (Tables 1 and 1a).

Table 1

Association between employment and gender

			Gender		Total
			Male	Female	
Employment	No	n	21	30	51
		%	55.3%	50.8%	52.6%
	Yes	n	17	29	46
		%	44.7%	49.2%	47.4%
Total		n	38	59	97
		%	100%	100%	100%

Table 1a

			Gender		Total
			Male	Female	
Education	Primary	n	16	19	35
		%	42.1%	32.2%	36.1%
	Secondary	n	20	35	55
		%	52.6%	59.3%	56.7%
	High	n	2	5	7
		%	5.3%	8.5%	7.2%
Total		n	38	59	97
		%	100%	100%	100%

A half of the interviewed sample reported that disturbances had their onset within one week after the flood, for 40% it was within one month after the disaster. The rest of the sample stated that symptoms started on the next day or within 6 months after the flood. These results are in line with diagnostic criteria set in diagnostic systems currently in force.

None of the victims asked for psychological or psychiatric support after the flood. It was determined by the poor availability of such services now and shortly after the disaster (the road to Bystrzyca Klodzka where the crisis psychological support centre was organised was ruined and impassable). According to literature, lack of such support may result in longer duration of PTSD symptoms (on average 64 months for those who were not helped compared to 36 months for those who received support) [10]. 15.5% of the sample examined in this study presented full range of PTSD symptoms up to one month preceding the day of the interview (i.e. up to 60^{th} – 63^{rd} month after the flood).

Majority of the interviewed persons showed intense symptoms of painful recollections about the trauma (79.4%), excessive nervousness not present before the flood and disturbed sleep (76.2% in each case). 73.4% of the sample admitted having had increased vigilance caused by the flood and it was still present at the interview. All the above symptoms were attributed by those studied to still present material damages left by the flood such as loss of whole or part of the house, not yet finished restoration, still having to live in substitute flats with very low standard which were intended for only a short period of inhabitancy but the stay there was prolonged. Continuous objective and material difficulties initiated originally by the flood, therefore, were still influencing the lives of flood victims sustaining their PTSD symptoms. Literature confirms that prolonged trauma is associated with longer duration of PTSD [7, 10, 23].

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