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Picture of posttraumatic stress disorder among flood victims correlated to scale of sustained loss

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SUMMARY

Aim: The aim of the study was to describe the prevalence and picture of PTSD among eye witnesses of flood, who had neither received any psychiatric treatment previously, nor experienced any other concurrent stressful life events that might have been an independent cause of the PTSD onset.

Material and methods: Flood victim were interviewed between the 60th and 63rd month after the flood by the same psychiatrist using the Composite International Diagnostic Interview (CIDI), section A (concerning demographic data) and section N (referring to PTSD). They were visited at home, by previous appointment over the phone. The course of PTSD was analysed in two groups (of 47 and 50 respondents) distinguished on the ground of flood-related material loss.

Results: The presence of PTSD was more frequent among those who had sustained severe loss due to the natural disaster (N = 30) than among persons who had experienced no significant loss (N = 30), with the PTSD ratios of 23.7 % vs. 7.2 % respectively. An analysis of symptom severity on the three main axes indicated a significantly higher prevalence of such symptoms on each axis in the group of victims who had experienced a permanent loss. In a vast majority of cases PTSD symptoms persevered for over a year, irrespective of the amount of loss.

Conclusions: The higher severity of symptoms in persons who had sustained a permanent loss evidences a relationship between PTSD and prolonged stressful situation due to permanent flood-related loss. The duration of symptoms similar in both compared groups indicates a stronger effect of the major stressor as well as a negative effect of absence of psychological support for the victims.

PTSD / **picture** / **flood** / **material loss** / **CIDI**

INTRODUCTION

Floods, volcanoes, earthquakes, outbreaks of fire in large parts of forests, hurricanes, cyclones and tornadoes affect a large population and play a big part in psychiatric epidemiological surveys. They cause emotional trauma and could be the cause of psychological distress caused by a real or anticipated fear of death, physical damage, economic loss or death of a close one (family member or relative). PTSD is claimed to be the most often diagnosed disorder related to trauma and it's thought to be quite persistent because sometimes it holds for many years [1, 2, 3].

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, disorganizes everyday life and

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is a source of dreadful cognitions which may lead to PTSD occurrence.

The flood Poland suffered in July 1997 was the largest natural catastrophe ever recorded in the history of the country. It occurred in 26 provinces, 6700 km^2 of arable land and urban area were flooded, that's about 2 % of Poland's area. 46.000 flats and households were destroyed causing a great economic and public loss. 55 lives were taken [4].

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 (5th – 9th July 1997). The rainfall reached locally up to 500 mm and that was three-four fold 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 the ground was already soaked up to its capacity due to the recent rainfalls.

Unexpectedly in just a few night hours 70 % of the mountain terrains of Ziemia Kłodzka were flooded. Almost 80 % of households located there were partially or completely destroyed. The analysis of flows showed that those recorded in 1997 were the highest ever observed in the area. The hydrologic reports on the day before the flood suggested no danger whatsoever. In the Nysa Kłodzka catchment basin the water reservoirs were mainly filled up to their medium capacity. Water levels recorded in Bystrzyca Kłodzka and Kłodzko were in upper part of the medium ranges and in other places were in upper part of low ranges and lower part of middle ranges. Despite this, the water level in Nysa Kłodzka River rose from 100 to 655 cm in five days (between 4th and 8th of July) in Biała Lądecka River it rose even more from 40 to 430 cm in just four days (between 4th and 7th of July) [5]. The utmost threat occurred in Nysa Kłodzka River-basin and according to data obtained from Community Crisis Centre in Bystrzyca Kłodzka 441 households were flooded, a tremendous loss in farming and farm equipment occurred [6].

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 catastrophe. The fact that a very small number of the victims had insured their homes or farms must be taken into account. Moreover, the insurance policies did not cover natural disasters. Therefore they received no compensations from insurance companies. Shoestring financial help offered by the authorities couldn't make up for the loss. Each family received 3000 PLN (regardless to the number of family members) in order to buy the basic necessities and household equipment.

The frequency of PTSD being a psychological reaction to the natural disaster depends on time that has passed since trauma occurred, the extent of the disaster and the methodology employed in the research. It appears that the persistence of symptoms of post-traumatic stress disorder largely depends on the social and psychological support victims receive afterwards. The fully or partially developed PTSD in victims who had not received professional support lasts for longer.

Prolonged exposure to stress and confrontation with physical loss caused by the calamity may play an important part in its chronicity. Literature confirms this hypothesis and results are in close relation to the group of individuals included in the study.

The study analyses the PTSD course amongst the victims of the upper Odra River-basin, the terrain notably affected by the disaster. The analysis consists of two subgroups of patients that strongly differed in loss amounts caused by the flood. The catastrophe extent described by sudden and huge water level rise, lack of alert, no time for employment of proper preventive measures, permanence of disruptions as well as lack of social and psychological support for the victims may influence the severity and persistence of PTSD symptoms.

THE AIM OF THE STUDY

1. Estimation of PTSD incidence in both subgroups.
2. Analysis of PTSD course:
   – detailed description of the most frequent symptoms belonging to three main axes included in diagnostic criteria of modern classification systems – DSM-IV and ICD–10: intense persistent and against one's will ideation of the trauma, persistent avoidance of

stimuli resembling the trauma, overreactivity not present before trauma;
- the symptoms occurrence frequency comparison in both subgroups: victims who had experienced no significant financial loss caused by the disaster and individuals severely affected (loss of household or damages influencing everyday living until the day of survey).

3. Estimation of the time of symptoms persistence depending on permanence of disruptions.

MATERIAL AND METHODS

Material

The study has been conducted in four villages in the Bystrzyca Kłodzka commune (Goworów, Michałowice, Zabłocie, Wilkanów) in the Nysa Kłodzka River-basin. This river was the one that rose in the quickest and the highest degree out of all rivers of the Odra River mountain tributaries. The villages were flooded all of a sudden during night hours and the disaster struck all the households in the area.

107 adult (≥ 18 years old) direct eyewitnesses of the flood were interviewed (40 men and 67 women). 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 GPs who were responsible for health care of population living in the regions devastated by the calamity.

The condition stating that only subjects with the same risk of trauma, its severity and duration would be examined has been fully satisfied (villages chosen for the study were flooded to the same extent and in comparably short time).

This condition has been dictated by the fact that PTSD incidence rates largely depend on the characteristics of population examined. The study was performed between July and September 2002, i.e. five years after the flood.

The fact that none of the interviewed subjects received any psychological or psychiatric support after the flood and the availability of such is still poor nowadays, was striking. Also, financial help offered by local authorities was minimal despite the fact it was much desired by the affected who had no chance for compensations from insurance companies because natural disasters were not covered.

The exclusion criteria (at least of the conditions listed below):
- psychiatric treatment before 1997,
- exposure to the traumatic event (other than flood in year 1997) that could be regarded as the independent PTSD cause,
- severe cognitive or memory impairment, delusional disorder, manic syndrome or withdrawal syndrome of any origin diagnosed during the interview.

Finally, 97 individuals were interviewed. In that number were 38 men and 59 women, 39.2 % and 60.8 % respectively. 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 the higher level of education. Little more than a half of those examined were unemployed (52.6 %), which placed these people in the lowest socioeconomic class.

Two subgroups of victims were compared: 47 individuals severely affected (loss of household or damages influencing everyday living until the day of the survey) and 50 victims who had not experienced significant financial loss caused by the disaster (48.5 % and 51.5 % respectively).

Methods

The instrument used in the study was the Composite International Diagnostic Interview (CIDI) designed as a cooperative project of WHO *(World Health Organization)* and ADAMHA *(United States Alcohol Drug Abuse and Mental Health Administration)*. CIDI was designed especially for the purposes of psychiatric epidemiological surveys in different cultural settings. The formula of the instrument allows its application to the individuals with different educational levels (acceptable for illiterates), questions are clear and simple without unnecessary idioms and colloquialisms [7]. Polish version of the CIDI was prepared according to WHO guidelines. The text translation covered back translation and linguistic consults [8]. 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. 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 [9, 10].

The instrument used in the study was the Munich version of CIDI covering the whole lifetime of the subject. In the study presented, 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 confirmation of the PTSD presence in the examined individuals but also analysis of the course of syndrome in time. This section contains 19 questions: closed ones, as well as questions concerning the onset of the symptoms, duration of the disorder and the moment symptoms cease.

The most frequent symptoms belonging to three main PTSD symptom axes are reflected in three section parts:

Questions N3 – N7 are useful in evaluation of the symptoms reflecting intense recollection of the stressful event.

- CN3 remembering against will,
- CN4 bad dreams or nightmares about the event,
- CN5 feeling as if the event was happening again,
- CN5A acting as if the event was happening again, even though it wasn't,
- CN6A getting very upset when the event was reminded,
- CN6B feeling anxious when the event was reminded,
- CN6C feeling helpless when the event was reminded,
- CN7 physiological hyper-reactivity when the event was reminded.

Questions N8 – N14 analyze symptoms from the group of persistent avoidance of stimuli resembling or associated with the stressor.

- CN8 trying not to think or talk about the event,
- CN9 avoiding places, people or activities that might remind the event,
- CN10 memory blank for all or part of the event,
- CN11 loosing of interest in doing things that were once important or enjoyable,
- CN12 isolation or distance from other people,
- CN13 more difficulty experiencing affection towards other people,
- CN14 pessimistic thinking about future.

Question N15 concerns symptoms of increased psychological sensitivity and arousal not present before exposure to the stressor.

- CN15A sleeping disturbances,
- CN15B concentration disturbances,
- CN15C greater carefulness,
- CN15D increased irritability or more frequent losing of temper,
- CN15E increased restlessness or vigilance.

The data obtained were analyzed by *Statistica* software, version 5.0 developed by StatSoft. The statistical methods used: U-test Mann-Whitney (M-W) – nonparametric test alternative to t-Student test for independent variables, χ^2-test used in distribution comparison of bivalent dependent variables.

RESULTS

Occurrence of PTSD as a result of flood experience was evaluated with section N of the CIDI instrument. Based on the data gathered from 97 persons, PTSD was confirmed in 30 individuals (30.9 % of the whole sample). The PTSD was diagnosed more often among individuals severely affected by the disaster – 23.7 % (n = 30) than victims who did not experience significant financial loss – 7.2 % (n = 30).

The construction of N section allowed the analysis of symptoms severity in three main symptom axes included in diagnostic criteria of modern classifications. The intensity of symptoms was evaluated by the amount of symptoms belonging to each of the main groups (G1, G2, G3), and a total of all diagnosed symptoms (G4 = G1 + G2 + G3).

Intensity comparison of all PTSD symptoms in both subgroups – individuals severely affected by the flood and victims who experienced no significant financial loss – showed greater mean intensity of all symptoms in the first subgroup (Fig. 1.) and the difference reached statistical

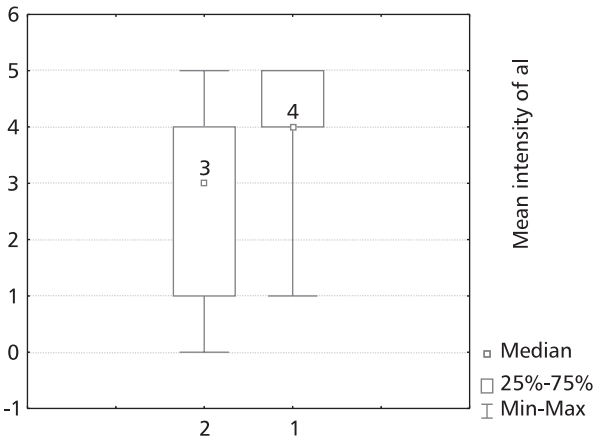

Fig. 1. Mean intensity of all PTSD symptoms (G4) in the subgroup of individuals severely affected (1) and participants who had not experienced significant financial loss (2)

importance according to M-W test ($p = 0.00139$, $Z = -4.34585$).

Symptoms intensity analysis in three main symptom axes showed their statistically important higher incidence in each of the main axes for individuals persistently affected by the disaster. The highest distinction of distribution was found in the group of overreactivity symptoms not present before trauma (Fig. 2) with statistical importance according to M-W test ($p = 0.00495$, $Z = -4.05831$).

Symptoms distribution in the main axes of intense persistent ideation of the flood (M-W test: $p = 0.002545$, $Z = -3.018$) and persistent avoidance of stimuli resembling the trauma (M-W test: $p = 0.000183$, $Z = -3.742$) was not well-defined in both the described subgroups of victims nevertheless the symptoms intensity reached statistical importance amongst individuals persistently affected by the disaster.

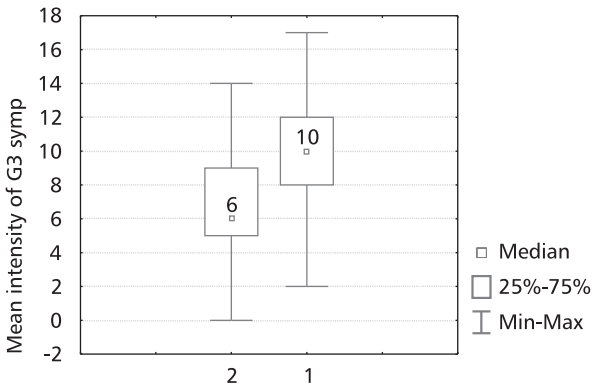

Fig. 2. Mean intensity of symptoms in the axis of hyperreactivity (G3) in the subgroup of individuals severely affected (1) and participants who had not experienced significant financial loss (2)

Section N of CIDI not only allowed demonstration of intensity distinction between the main PTSD symptom axes but each symptom was assessed as well, even if the diagnosis was not formally justified. The variables in groups were assessed with χ^2-test (Table 1.).

Significantly more symptoms were diagnosed in the subgroup of individuals severely affected by the flood and the significance reached statistical importance. The only symptoms which occurred with similar frequency in both subgroups were: feeling anxious when the flood was reminded (CN6B), feeling helpless when the event was reminded (CN6C) and acting as the event was happening again, even though it wasn't (CN5A).

The most frequent symptom in both subgroups was increased restlessness or vigilance not present before trauma (CN15E). Remembering against will (CN3), sleeping and concentration disturbances (CN15A and CN15B respectively) were the most frequent consecutive symptoms observed.

The construction of question CN17 allowed the determination of time point of the symptoms onset – answers for the question: "At what time after the flood the symptoms occurred for the first time?" were rated as follows: 1 – "during the same day", 2 – "during the same week", 3 – "during the same month", 4 – "during six months", 5 – "during one year", 6 – "after a year".

Half of the individuals fulfilling the criteria for PTSD defined the onset of symptoms as "during the same week" and 40 % as "during the same month". More than a half of all participants of the project defined the onset of symptoms as "during the same week" but the distribution of further answers was not so unequivocal as in the subgroup of individuals suffering from PTSD.

The distribution differences of onset time point between the group of individuals severely affected and victims who had not experienced significant loss did not reach statistical importance ($\chi^2 = 3.639$, $p < 0.45$).

Symptoms duration analysis was enabled by assignment of the following values to adequate answers: 1 – "less than a week", 2 – "less than a month", 3 – "one to six months", 4 – "six

Table 1. Correlation analysis of PTSD symptoms distribution in the subgroup of individuals severely affected (1) and participants who had not experienced significant financial loss (2). Chi-square test.

Symptom	Occurrence in subgroup 1		Occurrence in subgroup 2		χ^2-value	p-value
	present	not present	present	not present		
CN3	33	17	44	3	139.0071	< 0.00001
CN4	21	29	35	12	53.22245	< 0.00001
CN5	20	30	29	18	44.37788	< 0.00001
CN5A	1	49	1	46	0.4884005	0.484647
CN6A	23	27	30	17	14.06250	0.000177
CN6B	21	29	16	31	2.852050	0.091267
CN6C	17	23	17	20	0.1736111	0.676925
CN7	24	26	31	16	14.43850	0.000145
CN8	12	38	17	30	6.250000	0.012424
CN9	4	46	8	39	5.740610	0.016583
CN10	1	49	6	41	10.69850	0.001073
CN11	14	36	28	19	42.66667	< 0.00001
CN12	5	45	18	29	33.27674	< 0.00001
CN13	1	49	14	33	37.33333	< 0.00001
CN14	13	37	24	23	25.01000	< 0.00001
CN15A	30	20	43	4	117.3382	< 0.00001
CN15B	17	33	36	11	104.4043	< 0.00001
CN15C	29	21	39	8	44.29483	< 0.00001
CN15D	17	33	27	20	21.58303	< 0.00001
CN15E	29	21	45	2	376.0417	< 0.00001

months to one year", 5 – "more than a year". The vast majority of all participants both fulfilling criteria of PTSD and not, defined the period of symptoms persistence as "more than a year". The distribution of symptoms persistence in the whole group of patients resembled the distribution in the group of victims who experienced no significant loss. Despite the distribution differences in the group of individuals severely affected and victims who did not experience significant loss, the comparison of symptoms mean duration in both groups did not reach statistical importance ($\chi^2 = 0.801$, $p < 0.09$). The correlation between symptoms duration and the loss extent in the group of respondents suffering from PTSD was not observed ($\chi^2 = 0.976$, $p < 0.80$).

The last occurrence of PTSD symptoms was determined – question CN18AREC encoded following answers and adequate values: 1 – "during two weeks preceding the interview", 2 – "two to four weeks preceding the interview", 3 – "one to six months preceding the interview", 4 – "seven to twelve months preceding the interview", 5 – "during a year preceding the interview (without precise description)", 6 – "over a year preceding the interview". The construction of the question allowed evaluation of present occurrence of fully developed PTSD. The diagnosis was confirmed in 15.5 % of all 97 participants. The analysis of PTSD symptoms persistence in individuals who did not fulfill PTSD criteria showed that victims severely and persistently affected displayed the symptoms until one month before the interview significantly more often than participants without significant financial loss ($\chi^2 = 10.878$, $p < 0.012$). The most persistent symptoms had significantly stronger correlation with the diagnosis than loss extent ($\chi^2 = 9.619894$, $p < 0.022$).

Long-lasting and simultaneous persistence of PTSD symptoms among majority of victims

induced the analysis of subthreshold PTSD (sPTSD) occurrence. The diagnosis might be based on the fact that at least one symptom in each of three main symptom axes lasts for more than one month [11, 12]. The participants interviewed did not fulfill criteria for developed PTSD. Symptoms of sPTSD were present in 63.9 % of the individuals without diagnosis of PTSD (n = 67) and the frequency of its occurrence amongst victims severely affected reached statistical importance ($\chi^2 = 108.389$, $p < 0.0001$).

DISCUSSION

The study has been conducted 60 – 63 months after the flood. PTSD was diagnosed in 30.9 % of the recruited sample and 15.5 % of the group presented fully developed PTSD until one month before study. This result is concordant with outcomes of the other studies reported in literature worldwide. 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 [13, 14, 15].

Published papers confirm frequent PTSD diagnosis amongst victims suffering from considerable material loss caused by natural disaster [16, 17, 18, 19, 20]. The study corroborates with the results and the PTSD symptoms quantity analysis allowed the confirmation of their higher intensity in that subgroup. The highest disparity relates to the group of symptoms regarding increased psychological sensitivity and arousal not present before exposure to the stressor. It could be assumed that the permanence of property lost due to the flood affects in notable manner the victim's functioning, moreover daily exposition to conditions reminding the trauma (breakage of the whole or part of the house, incompleted renovations, damages in settled houses, excessive humidity, prolonged living in poorly equipped substitute homes) might be of great importance. The participants associated the symptoms intensity with persistent hardship caused by the catastrophe. None of the victims interviewed, received psychiatric or psychological help after the event due to traffic difficulties caused by the flood (the road to Bystrzyca Kłodzka was closed and the victims had no opportunity to receive any help from the psychological help-point located there). In conformity with literature, the lack of such support prolongs PTSD symptoms presence (mean 64 months) [13, 14, 21].

Half of the participants defined the onset of symptoms as "during the same week" and 40 % as "during the same month". The others defined the onset as "during the same day" or "during six months". The results are concordant with diagnostic criteria of PTSD included in the classification systems. Analysis of the time point of symptoms onset did not show any correlation with loss extent, proving that catastrophe characteristic (sudden and unexpected occurrence, the scale) causes psychological reaction independently from financial consequences.

Despite the lack of significant differences in PTSD symptoms permanence depending on damages extent, further analysis showed that individuals with developed PTSD, presented the symptoms during the interview significantly more often than representatives of the subgroup severely affected by the flood.

The study confirms significantly stronger intensity of subthreshold PTSD symptoms amongst individuals heavily affected by the flood. PTSD occurrence in the whole interviewed group was concordant with literature [12, 22].

Intense and long-lasting presence of fully developed or partial PTSD or particular symptoms, such as anxiety and/or depressive disorder require assurance of professional assistance for the victims of flood. Individuals presenting intense symptoms received information about treatment opportunities.

CONCLUSIONS

1. PTSD was diagnosed more frequently amongst victims severely affected by the disaster (23.7 %), likewise subthreshold PTSD occurred more often in that subgroup. Intensity of symptoms among victims fulfilling classification criteria for developed as well as partial PTSD was significantly higher in the subgroup of individuals severely affected. The majority of participants (independently from loss extent) presented the symptoms for a period "longer than a year" and none of them defined the symptoms' persistence as "less than

a month", that could be due to damages permanence. There was no significant correlation between symptoms duration and damages extent suggesting close relation of psychological reaction to main stressor – the flood, than secondary stressors resulting from damages. Analysis of present PTSD symptoms confirms this thesis.

2. The long-lasting presence of symptoms reflects the need of easier access to psychological and in certain cases psychiatric support. The offer of adequate therapy in Bystrzyca Kłodzka commune was restricted, resulting in persistence of stressors impact.
3. The instrument used in the study – the Composite International Diagnostic Interview (CIDI) is suitable for such surveys. The formula of the instrument is clear and simple for patients and the interviewer. Construction of the sections allowed determination of the PTSD syndrome duration, as well as analysis of particular symptoms included in the criteria of diagnosis and forming a clearer picture of respondents' emotions.

REFERENCES

1. Bromet E, Dew MA. Reviev of psychiatric epidemiologic research on disasters. Epidemiol Rev. 1995, 17: 113–119.
2. Sharan P, Chaudhary G, Kavathekar SA, Saxena S. Preliminary report of psychiatric disorders in survivors of a severe earthquake. Am J Psychiatry 1996, 153: 556–558.
4. Green BL, Lindy JD, Grace MC, Leonard AC. Chronic posttraumatic stress disorder and diagnostic comorbidity in a disaster sample. J Nerv Ment Dis. 1992, 180: 760–766.
5. Majewski W. Powódź lipiec 1997. Pismo PG 1998; 4.
6. Olearczyk D, Tokarczyk T. Powódź 1997 r. w Kotlinie Kłodzkiej a powodzie historyczne. 2002. www.powodz.info
7. Woźniak Z. Skutki powodzi w lipcu 1997 roku w gminie Bystrzyca Kłodzka. 2003.02.13. www.powodz.info
8. Robins LN, Wing J, Wittchen HU, Helzer JE, Babor JF, Burke J, Farmer A, Jablensky A, Pickens R, Regier DA, Sartorius N, Towle LH. The Composite International Diagnostic Interview. Arch Gen Psychiatry 1988, 45: 1069–1077.
9. Kantorska-Janiec M. Ocena parametrów psychometrycznych polskiej wersji Złożonego Międzynarodowego Kwestionariusza Diagnostycznego CIDI w rozpoznawaniu zaburzeń afektywnych. Rozprawa doktorska; Wydział Lekarski Kształcenia Podyplomowego Akademii Medycznej we Wrocławiu, marzec 2004.
10. Kiejna A, Grzesiak M, Kantorska-Janiec M. Złożony Międzynarodowy Kwestionariusz Diagnostyczny (CIDI) – możliwości wykorzystania w badaniach ekonomicznych w psychiatrii. Psych Pol. 1998, 4: 463–480.
11. Grzesiak M, Kiejna A. Kwestionariusze diagnostyczne i ich zastosowanie w badaniach epidemiologicznych w psychiatrii. Psych Po. 1998, 4: 519–533.
12. Murray SB, Walker JR, Hazen AL, Forde DR. Full and partial posttraumatic stress disorder: findings from a community survey. Am J Psychiatry 1997, 154: 1114–1119.
13. Mylle J, Maes M. Partial posttraumatic stress disorder revisited. J Affect Disorder 2004, 78: 37–48.
14. Kessler RC, Sonnega A, Bromet E, Hughes M, Nelson CB. Posttraumatic stress disorder in the National Comorbidity Survey. Arch Gen Psychiatry 1995, 52: 1048–1060.
15. Verger P, Rotily M, Baruffol E, Boulanger N, Vial N, Sydor G, Pirard P, Bard D. Évaluation des conséquences psychologiques des catastrophes environnementales : une étude de faisabilité ŕ partir des inondations de 1992 dans le Vaucluse (France). Cahiers Santé 1999, 9: 313–318.
16. Breslau N, Kessler RC, Chilcoat HD, Schultz LR, Davis GC, Andreski P. Trauma and Posstraumatic Stress Disorder in the Community. The 1996 Detroit Area Survey of Trauma. Arch Gen Psychiatry 1998, 55: 626–632.
17. Caldera T, Palma L, Penayo U, Kullgren G. Psychological impact of the hurricane Mitch in Nicaragua in one-year perspective. Soc Psychiatry Psychiatr Epidemiol. 2001, 36: 108–114.
18. Goenjian AK, Steinberg AM, Najarian LM, Fairbanks LA, Tashjian M, Pynoos RS. Prospective study of posttraumatic stress, anxiety, and depressive reactions after earthquake and political violence. Am J Psychiatry 2000, 157: 911–920.
19. Norris FH Epidemiology of trauma: frequency and impact of different potentially traumatic events on different demographic groups. J Consult Clin Psychol. 1992, 60: 409–418.
20. Norris FH, Murphy AD, Baker CK, Perilla JL. Severity, timing, and duration of reactions to trauma in the population: an example from Mexico. Biol Psychiatry 2003, 53: 769–778.
21. Verger P, Hunault C, Rotily M, Baruffol E. Facteurs de variation de symptoms de stress post-traumatique cinq années aprčs l'inondation de 1992 dans le Vaucluse. Rev Epidemiol Sante Publique 2000, 48: 2544–2553.
22. Shalev AY, Tuval-Mashiach R, Hadar H. Posttraumatic stress disorder as a result of mass trauma. J Clin Psychiatry 2004, 65(Suppl 1): 4–10.
23. Carlier IV, Gersons PB. Partial posttraumatic stress disorder : the issue of psychological scars and the occurrence of PTSD symptoms. J Nerv Ment Dis. 1995, 183: 107–109.