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# PREVALENCE OF POST-TRAUMATIC STRESS DISORDER, SYMPTOMATOLOGY AND COPING STRATEGIES AMONG SLOVENE MEDICAL EMERGENCY PROFESSIONALS

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*SUMMARY: The study analyses the prevalence of stress events and Post traumatic stress disorder (PTSD) among Slovene medical emergency professionals working in a traumatogenic environment. Results showed that 7% of this population suffers from a complete clinical feature of PTSD and over one third experiences some of the PTSD symptoms. The study indicated that symptoms of PTSD differ according to the length of working period, educational level, job position and gender while incidence of severe PTSD does not differ among the groups. The majority of the responders do not get professional mental health support even though they express a need for it. Results support the need of a well-organized and attainable professional program for PTSD screening, psychosocial and psychotherapeutic support for medical emergency professionals.*

**Keywords:** medical emergency professionals, stress, trauma, PTSD, symptoms, coping

## INTRODUCTION

Post-traumatic stress disorder (PTSD) is an anxiety disorder characterized by an acute emotional response to a traumatic event or situation involving severe environmental stress (Berger, Coutinho, Figueira, Marques-Portella, Luz, Neylan, Marmar, & Mendlowicz, 2012). PTSD can consist of a wide spectrum of symptoms including flashbacks and nightmares of the event, anger, anxiety, depression, irritability, impaired concentration, hyper vigilance or an exaggerated startle response (Nayback, 2009). According to DSM-IV PTSD occurs to people who experienced a traumatic event that fulfills the stressor criterion and has been described widely in war survivors,

both soldiers and civilians (American Psychiatric Association, 2013). Up to date research shows that long term stressful everyday events such as terminal illness, problems with relationships or stress at work can also lead to symptoms of PTSD (Joseph, Mynard, & Mayall, 2000; Lindberg & Wellisch, 2004; Mol, Arntz, Metsemakers, Dinant, Vilters-van Montfort, & Knottnerus, 2005). Some of the most stressful work environments include medical emergency services. According to Berger et al. (2012) a rescue worker is any person who professionally or voluntarily engages in activities devoted to providing out-of-hospital acute medical care, transportation to definitive care, freeing persons or animals from danger to life or well-being in accidents, fires, bombings, floods, earthquakes, other disasters and life-threatening conditions. This work carries the risk of witnessing events and personal experiences associated with helping people in emergency life-threatening circumstances such as seeing a patient die, massive bleeding and trauma rela-

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ted injuries. The Slovene rescue workers perform their work in 12 hours long night and day shifts, exposed to rough meteorological circumstances, traffic accidents, stressful and traumatizing situations. During the last decade an absolute and relative number of medical care professionals, especially physicians decreased which increased the workload and everyday stress at work for rescue workers in emergency services. Many of them spent more than twenty or even thirty years on duty in emergency services. During this time, they were exposed to severe traumatization and burnout in physical and psychological aspects, which can result in the development of symptoms associated with posttraumatic stress (Rybojad, Aftyka, Baran, & Rzożnca, 2016).

Studies (Laposa, Alden, & Fullerton, 2003; Numi, 1999; Regehr & Goldberg, 2002) showed that both paramedics and emergency department health care workers have been shown to be at increased risk of PTSD. Some studies (Sorenson, 2002; Bennett, Williams, Page, Hood, & Woollard, 2004) showed a prevalence rate of 20%–22% for PTSD among paramedic personnel. Saberri, Marooji, and Ghoreishi (2008) found that considering DSM-IV criteria, 36.4% of participants met the PTSD criteria. Using impact of event scale (IES), they found a trauma severe impact among 28.9 % of emergency personnel. The study of Rybojad et al. (2016) showed an even higher percentage of the total prevalence of PTSD in the group of polish paramedics which was 40.0% (64.3% for women and 36.1% for men). Iranmanesh, Tirgari, and Bardsiri (2013) found that most paramedics (94%) and hospital emergency personnel reported moderate PTSD. The emergency personnel reported a higher score of M-PTSD than the paramedic personnel in all subscales.

PTSD was more frequently reported in paramedics working under an employer's contract than among those who were self-employed (Rybojad et al., 2016). It occurred less frequently in women and persons with higher education. Razik, Ehring and Emmelkamp (2013) showed that age was not significantly correlated with any of the symptom severity measures. Similarly,

Mealer, Burnham, Goode, Rothbaum, and Moss (2009) found that among University hospital nurses, 22% had symptoms of PTSD, 18% met diagnostic criteria for PTSD, and 86% met criteria for burn out symptoms (BOS). Ninety-eight percent of those fulfilling diagnostic criteria for PTSD were positive for BOS.

The presence of PTSD in emergency personnel has been found to be related to reduced quality of life, poor physical health, more medical visits and more suicidal ideation (Berger et al., 2012; Maia, Marmar, Metzler, Nobrega, Berger, Mendlowicz, & Coutinho, 2007). Therefore, it is very important to recognize PTSD symptoms as soon as possible and determine the factors that can contribute to the development of PTSD and the ones that help to cope with stressful situations and PTSD. It was reported (Sorenson, 2002; Bennett et al., 2004) that factors such as age, sex, being unmarried, personality traits and earlier experience of violence correlated with development of PTSD. They are joined under the general term resilience. Resilience refers to the ability to keep going in the face of stress and other adversity (Connor & Davidson, 2003) or as the ability to adapt to or bounce back from extremely unfavorable circumstances (Tusaie & Dyer, 2004). Resilience plays a crucial role in posttraumatic positive changes (Zoellner & Maercker, 2006; Yu et al., 2014). Together with social support it has been recognized as a coping strategy which assists survivors to recover from traumatic events (Cofini, Carbonelli, Cecilia, & Binkin, di Orio, 2015; Leipold & Greve, 2009), correlates with fewer PTSD symptoms (Connor and Davidson, 2003) and negatively correlates with PTSD symptom severity (Ssenyonga, Owens, & Olema, 2013). There is evidence that some trauma survivors engage in dysfunctional coping strategies, such as rumination and thought suppression, which causes the prolonged maintenance of PTSD (Clohessy & Ehlers, 1999). Razik et al. (2013) states that trauma-related rumination, avoidant coping and aggressive behavior all significantly predicted levels of PTSD related to terrorist attacks. They also showed that high levels of perceived social support re-

late to lower levels of anxiety and depression. Danuza, Arenliu, & Masten (2014) showed that PTSD correlates with lack of social support and low socio-economic level among the sample of war veterans.

Proper education and psychosocial help can be particularly beneficial in coping with PTSD and stressful jobs. At the moment, no organized psycho-social service is available in Slovenia for counseling and therapeutic resolution of such traumatogenic and stressful experiences. Moreover, the screening for PTSD would be very welcome to establish if a person needs help and hence provide it as soon as possible which will then lower the symptoms expression level and shorten the symptoms expression period.

## SCOPE OF RESEARCH

The study focused on the analysis of the presence and content of stress related events and PTSD among Slovenian medical emergency professionals. Detailed analysis was made according to sex, number of years of employment, type of work and education. As possible indicators of the long term consequences in term of severe trauma and stress related disturbances, coping mechanisms of Slovenian medical emergency professionals were analyzed. The final aim was to detect if the PCL-M screening test is an accurate measure of exposure to a prior stressful event. If this is so, it could be a useful method for early PTSD symptoms detection and later support of the medical emergency professionals in need.

## METHODOLOGY

### Instruments

A standard DSM IV TR checklist for PTSD, the PCL- M developed by Frank Weathers and his colleagues and adapted to the Slovene population was used (Weathers, Litz, Herman, Huska, & Keane, 1993). Additionally, an ad hoc questionnaire was applied, to collect information on

demographic data, work history and 4 open ended questions to get detailed data about the incidence and prevalence of stressful events and the applied coping strategies. The questions were:

1. *Briefly describe the most stressful event that comes to your mind.*
2. *Who did you ask for help?*
3. *What helped you?*
4. *What kind of help would you like in a stressful situation?*

Data was appropriately coded;

- For question 1: death/dying person (especially young and children), car accidents (with children involved), giving birth on the field, reanimation (especially of children), children being harmed, suicide, family threats, forced hospitalization, threats, other
- For question 2: no one, coworkers, friends, we have no organized help, other, no answer
- For question 3: conversation (with family, friends, coworkers, boss), sport/physical activity/relaxation, time, holiday/rest, analysis of the event, knowledge/experiences nothing, other
- For question 4: professional (psychiatrist, psychologist, psychotherapies, group therapies), conversation (coworkers, friends, boss), education, I don't need help, I don't know, no answer

Further, data were completed with a 20-50 minutes long narrative interview about the personal stories behind traumatic events with randomly selected responders.

### Sample and procedure description

The survey was conducted in 2013. Anonymous questionnaires were sent to all of the 47 medical emergency service units registered with the Slovenian chamber of medical care. This represents a representative sample for the population of Slovenian medical emergency professionals. The team leaders were informed about the aim of

the research and were asked for cooperation and agreed about the Informed Consent form. Only five stations rejected cooperation. There were 413 completed and returned questionnaires out of 700 possible, which means 59% response rate. Besides, 80 randomly selected emergency care doctors fulfilled the survey. Of the responders, 67% were male, 33% female; 84% were paramedics and 16% physicians. With respect to the education level, 68 % of them had a high school education, 17 % had a college degree and 16% finished medical school (a university degree). The responders were professional carriers of various length, from one month being the shortest to 42.5 years which was the longest one. More precisely, 54% of the responders had spent less than 10 years in the emergency service, and 46 % more than 10 years.

The data, retrieved from the questionnaires were statistical analyzed by using an SPSS for Windows 21 (2012) and MedCalc 15.6 (2012) software package.

## RESULTS

First, descriptive statistics, showing basic data about the prevalence and content of stressful events, coping strategies and PTSD symptomatology among Slovene medical emergency professionals is presented, following by the analysis of the accuracy of PTSD questionnaires for detecting past traumatic experiences.

*Exposure to stress.* Data showed that more than half (63.5 %) of the responders experienced a stressful event during their professional life that caused them emotional burden, among them 55.8% in the last year. The prevalence of the constant exposure to stressful life events, experienced at the workplace by the responders was 30,9 %. The results showed that Slovene emergency health professionals experience a high amount of stressful or traumatic events during their work.

*Nature of stressful events.* When asked about the most stressful events, 17 % of the responders

spoke of events including death, especially of children and young people. Traffic accidents including children represented a relevant and most stressful event for 16 % of the responders. Giving birth outside hospital settings, resuscitation, injured children, suicide, etc. represented a most stressful event for 10% of the responders. Most personally shocking events for the participants with high PTSD were compulsory hospitalization, aggressive relatives and injuries of young people.

*Coping strategies.* Qualitative analysis of the coping strategies showed that most of the responders (34 %), after an exposure to an intense trauma provoking event, didn't ask anyone for help and debriefing while 17% of them asked colleagues for support. Out of those 17% who asked for support one third of the responders (35%) concluded that a supportive conversation with colleagues and relatives led to the decrease of trauma-related emotions and other phenomena. Only 8% of them see physical activity as the best relief and 35% offered no answer. The rest of responders mentioned several other ways of coping. When asking them about the kind of support they miss most responders (22%) expressed an opinion that a professional psychological support and education is necessary for relief after intense stress. When asking the responders with high level of PTSD how they searched for help in the case of stress, most often (in 33%) they expressed their concern about not having organized help at their disposal, 27% of them did not ask anyone for help, 38% of all participant in this group believed that professional psychological help and education would be the most beneficial and only 4 % thought they don't need any kind of help.

*PTSD symptomatology.* PTSD symptoms relate to three categories:

- B: intrusive memories / behaviors / feelings and flashbacks
- C: (cognitive/behavioral) avoidance / apathy
- D: increased arousal.



Diagnostic criteria for PTSD is met if there is a combination of category B (PCL-M items 1-5), C (PCL-M items 6-12) and D symptoms (PCL-M items 13-17). PTSD is diagnosed if a responder confirms at least one statement from category B, at least 3 statements from category C and at least 2 confirmations of category D statements.

Results showed that 34 % of responders experienced at least one symptom of category B, 18% 3 or more symptoms of category C and 23% at least 2 of category D. Symptoms from all three categories, showing the presence of PTSD according to DSM evaluation criteria were present with 10% of responders. Besides the above mentioned evaluation, there is a normative measure of PTSD: 44 points on PCL-M being the indicator of high PTSD level. According to this method, 9% of responders showed PTSD signs. The combination of both evaluation methods showed that 7 % of responders have severe PTSD.

According to normative analysis, physicians had a higher percentage of severe PTSD (36%) than rescue workers (21%), but the difference was not statistically significant ( $\chi^2=0.426$ ,  $\alpha>0.05$ ). Normative analysis showed that female responders show more severe PTSD (29%) than male responders (21%) but the differences were not statistically significant ( $\chi^2=0.221$ ,  $\alpha > 0.05$ ). Normative analysis showed severe PTSD for medical students in 36%, while 21% for responders who finished high school. These differences however, were not statistically significant ( $\chi^2=0.913$ ,  $\alpha>0.05$ ). Incidence of severe PTSD did not statistically differ among responders with different years of active work in emergency health service ( $\chi^2 = 0.426$ ,  $\alpha>0.05$ )

What are the differences in the expression of different PTSD symptomatic according to occupation, gender, working period and education is presented in Table 1.

From Table 1 we can see that the physicians show more symptoms in all three categories than other professionals, the biggest being the difference in category D symptoms (including anxiety and irritability).

Results showed that females are more vulnerable to traumatic experiences than males. They showed more trauma related memories and flashbacks (category B). The level of difficulties with concentration, emotional non-responsiveness and avoidance of situation, triggering traumatic experiences (category C) was slightly higher with female responders. Male responders showed more increased arousal (category D) than female.

Professionals with a higher level of education showed more symptoms in all three categories, especially high being vulnerability to stressful and traumatic situation in the sense of exaggeration, low affective control, insomnia and recollection of trauma.

The number of years, spent in the emergency service also represented an important element of trauma and stress related sensitivity. Professionals with more than ten years of service in general reported more trauma related category B and C symptoms than their colleagues at the beginning of their carrier. There was no difference among the groups according to the incidence of symptoms relating to increased arousal (category D).

**Table 1. Average percentage of confirmative answers on questions showing the PTSD symptomatic according to occupation, gender working period and education**

**Tablica 1. Prosječan postotak potvrdnih odgovora na pitanja o simptomima PTSP-a s obzirom na zanimanje, spol, duljinu staža i obrazovanje**

PCL-M Category	Occupation		Gender		Education			Work period	
	Dr	resc	F	M	uni.	colleg	Midd.	>10	<10
B: intrusive memories/ behaviors /feelings and flashbacks	28,8	16,2	20,4	17,4	28,8	16,8	16,4	20,2	18,4
C: (cognitive/ behavioral) avoidance / apathy	18,1	15,0	16,7	15,1	18,1	16,0	15,0	18,9	15,4
D: increased arousal	19	13,4	19,2	11,8	19	15,2	13,2	14,8	14,8

### PCL-M accuracy for determining prior exposure to stressful or traumatic events

We wanted to explore the accuracy of the PCL-M questionnaire for determining the individuals' prior exposure to stressful or traumatic events. On the basis of statistical analysis of the PCL-M results we divided our sample into two groups - responders with and responders without traumatic event (avg. PTSD score= 23.46 respectively 43.75). On the basis of the sensitivity versus specificity criterion value we defined the optimal cut-off criterion of PCL-M scale for determining prior exposure to traumatic event being 23. If classifying the participants according to this optimal cut-off criterion, 69.3% of individuals who experienced traumatic event and 58.9 % who did not experience prior trauma were correctly classified (sensitivity vs. specificity).

In order to validate the diagnostic test results, the receiver operator curve (ROC) and the area under the curve measure (AUC) was used (Krzyszowski & Hand, 2009). The AUC value in the research was 0,692 ( $p=0,000$ ) indicating that the PCL-M test and the set cut off criterion is an accurate measurement for the prediction of the stressful or traumatic event experience. Further analysis showed, that the prediction of stressful or traumatic experience is most accurately predicted when taking into account the symptoms measuring re-experiencing and avoidance. Exploratory factor analysis using Principal Axis Factor (PAF) technique of 17 Likert scale questions from PCL-M showed that we could explain 48,62 % of the total variance with the factor expressing re-experiencing the stressful or traumatic event and using the avoidance coping strategies. Factor expressing numbing additionally explained 8% of the variance, while factor describing hyperarousal 6% of the variance. The Bartlett's Test of sphericity on this model was statistically significant ( $\chi^2(136) = 4146.57, p < 0,001$ ).

Discriminant analysis showed that the most discriminative PCL-M questions between the responders with high and low PTSD scores were the following:

- *Do you get nervous or excited quickly?*

- *Are you irritable or get angry quickly?*
- *Do you have insomnia?*
- *Are you over attentive and tense?*
- *Do you experience body reactions such as heart beating, breathing problems or sweating when remembering stressful experience?*
- *Do you have problems with concentration?*
- *Do you avoid situations that remind you of stressful event?*

On the basis of these questions we correctly classified 96.1% of responders.

As this is a research of limited scope of generalization, we have to acknowledge this finding as indicative. Further studies that would show the sensitivity and specificity of these seven questions would be needed. If further research shows that these seven questions are PTSD discriminative enough, they could be used for rapid intermittent scans for identifying individuals in need of additional assistance in dealing with PTSD.

## DISCUSSION

The research, carried out on the sample of Slovene medical emergency professionals, showed a high level of exposure to stress and trauma provoking events. The prevalence of PTSD is higher than estimated by Berger et al. (2012) for paramedics in other European countries or Koelkebeck et al. study (2015) which showed a prevalence of 0.9–2.6% of PTSD in clinical practice across Europe. Bennett et al. (2004) and Iranmanesh et al. (2013) on the other hand found higher PTSD incidence among emergency medical technicians and paramedics (22% in UK and 94% in Iran). The estimation of the PTSD prevalence can vary according to the strictness of the criteria. The results suggest that the everyday work experiences of medical emergency workers are very stressful, similar to the trauma provoking exposure of military personal (Fjeldheim et al., 2014). On one hand, they are witnessing horrible scenes of injured and even dead people,

on the other hand they are active participants of the trauma related situations, which results in a feeling of responsibility and helplessness. Additional narrative questioning of interviewees confirmed that medical practitioners, as key persons on the scene, are under big pressure due to their competence and responsibility.

Our findings (see Table 1) show that female rescue workers are more vulnerable to posttraumatic stress disorder symptoms (PTSS), however the diagnosis of severe PTSD does not differ between the genders. Results are congruent with Irish et al. (2011) who found that females are at a higher risk than males for developing PTSS following exposure to trauma, which may stem from gender differences in initial physiological and psychological responses to trauma. A number of individual and trauma-related characteristics have been hypothesized to contribute to gender differences in PTSS including sex differences in psychophysiology and differences in appraisal of threat, dissociation, coping style and social support (see review by Olf, Langeland, Draijer, & Gersons, 2007). Our results do not support the findings of several previous researches (Rybojad et al., 2016; Ashikyan, 2005; Jakovljevic, Saric, Nad, Topic, & Vuksan-Cusa; 2006) stating that women are more likely to be diagnosed with PTSD or the one of Berger et al. (2007) and Bennett et al. (2004) showing significantly higher incidence of PTSD with men than with women.

The number of years, spent in emergency service also represents a factor in favor of development of PTSS (see Table 1). This indicates that no adaptation to stress is obtained by a longer working period and no coping skills are gained with experiences.

The results of our study support the findings of Iranmanesh et al. (2013) showing correlation between participants' educational level and job position with PTSS, indicating that physicians and personnel with a bachelor degree are more likely to have more PTSS than their colleagues in the paramedic group. The cause for these results may be in the nature of the work of physicians

or higher educated personnel, which is more demanding, stressful and responsible.

Our study showed that symptoms, reflecting hyperarousal, exaggerated startle response, sleep disturbances, irritability, etc. represent significant elements of PTSD. These symptoms can also be interpreted as signs of depression, meaning that exposure to severe stress may cause a broad spectrum of psychopathological symptoms and not only PTSD. It is not uncommon for PTSD to co-occur with other negative symptoms. Mealer et al. (2009) showed that nurses with PTSD show burn out symptoms (BOS). Co-existence of PTSD and BOS has a dramatic effect on work and non-work related activities and perceptions. The presence of such symptoms may sometimes be misrepresented by the subjects as well as the professionals.

As can be seen from the results, despite high exposure to stressful events and PTSS, medical emergency professionals use unspecific coping strategies such as a conversation with peers, recreational activity, anxiolytics and even alcohol beverages, even though many of them perceive the need for professional support and education. Other authors report about similar coping strategies (Krzanowski & Hand, 2009; Neria, DiGrande, Adams, 2011; Welch et al., 2014). Due to the high percentage of emergency medical workers, showing PTSD symptomatology it seems plausible to conclude, that a well-organized and easily attainable professional program for psychosocial and psychotherapeutic support is definitely needed.

Several measures can be taken in order to prevent PTSD and to properly cure the PTSD symptoms. Firstly, PTSD screening tests should be done. As shown, the PCL-M test is a good indicator of the trauma related events in the past. When persons in need are identified, further measures should be taken. Rybojad et al. (2016) stated that an important aspect in the prevention of PTSD is access to institutional support and early psychological assistance. It is important that after a particularly traumatic event, paramedics are able to attend therapeutic meetings to reconsi-

der and evaluate their own participation, the so-called critical incident stress debriefing. This method, proposed by Mitchell (1983) provides a fairly quick way to reduce the effects of posttraumatic stress in people who have witnessed a traumatic situation. The aim of the team conducting the debriefing is to provide information that encourages re-processing by the rescuers. The possibility for open expression of daunting feelings immediately after the event can help the rescuers to accept the event. Each member of the emergency service team should be encouraged to take advantage of such help. The findings of Koelkebeck et al. (2015) however, indicate that pharmacotherapy is well available across Europe while psychological interventions were much less widespread. For example, psycho education was widely available in 52% of the countries (n=12), cognitive-behavioral therapy in 26.2% (n=6), and specific trauma-focused techniques were rarely available. Training on PTSD was part of the official training in 13 countries (56.5%), predominantly in the form of theoretical seminars.

## CONCLUSIONS

An epidemiological survey was carried out to detect the exposure to stressful or traumatic events, prevalence of PTSD and coping strategies in the population of Slovene medical emergency professionals. The analysis confirmed that stress and trauma exposure among them is high. More than two thirds of responders experienced at least one traumatic event, one third showed presence of at least one PTSD symptom and 7% of them severe PTSD. The symptoms of PTSD differ according to length of working period, educational level, job position and gender whereas these factors do not affect incidence of severe PTSD. Therefore, PTSD screening procedure would be very beneficial for all professionals working in the field of emergency medical service. It should include discovering behaviors like re-experiencing a stressful or traumatic event or using avoidance coping strategies, which showed to be related to trauma experience. The study also shows the lack of usage of

appropriate professional psychosocial support in stressful events that occur during medical work. Professional and organized psychosocial support would enable effective coping with traumatic events. Implementation of appropriate interventions is highly recommended as well as educational activities oriented to the recognition of stress related problems and application of adequate coping strategies.

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## **UČESTALOST POSTTRAUMATSKOG STRESNOG POREMEĆAJA, SIMPTOMI I STRATEGIJE SUOČAVANJA SA STRESOM MEĐU PROFESIONALNIM DJELATNICIMA HITNE POMOĆI**

*SAŽETAK: Studija proučava učestalost stresnih događaja i posttraumatskog stresnog poremećaja (PTSP) kod profesionalaca u hitnim medicinskim službama, tj. u traumatizirajućem okruženju. Rezultati pokazuju da 7 % ove populacije pati od svih oblika pojavnosti PTSP-a, a više od trećine od nekih simptoma PTSP-a. Nadalje, studija pokazuje da simptomi PTSP-a variraju s obzirom na duljinu staža, razinu obrazovanja, radno mjesto i spol, dok se učestalost ozbiljnog PTSP-a ne razlikuje mnogo s obzirom na pojedine skupine. Većina subjekata ne dobiva nikakvu psihološku potporu iako izražavaju potrebu za takvom potporom. Rezultati ukazuju na potrebu dobro organiziranog i dostupnog programa za utvrđivanje PTSP-a, te za psihosocijalnu i psihoterapijsku pomoć profesionalnim djelatnicima u hitnim medicinskim službama.*

**Ključne riječi:** profesionalni djelatnici u hitnim medicinskim službama, stres, trauma, PTSP, simptomi, suočavanje

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