

NATIONAL UNIVERSITY OF PUBLIC SERVICE
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**SCREENING OF SLEEP – AWAKE DISTURBANCES WITH
QUESTIONNAIRE IN GROUPS OF MEMBERS OF ARMED FORCES,
DETECTING THEIR CHANGES AFTER SERVING IN MISSION**

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1. CONCEPTUALIZATION OF THE SCIENTIFIC PROBLEM

According to the mission described in the Combined Arms Doctrine of the HDF "the mission of the health service in military operations is to preserve life force, protection of life and to minimize physical and mental damage". Accordingly, "from the point of view of health service, the protection of the fighting force is the preservation of the soldiers' health, keeping them in deployable condition in their maximal strength at the given time and place."

From the aspect of the aim described in the doctrine, that the soldier's health and fighting force must be protected it's primal to have the appropriate amount and quality of sleep, that is not examined in the screening tests and in the suitability tests either.

It's a well-known fact, that sleeping is vital for the appropriate daily activity. As a consequence of not sufficient sleep we could become tired, exhausted, we can't concentrate or execute tasks that need undivided attention.

Not sufficient sleep in quality or in quantity can lead to the destruction of its regenerating, reconstructing, preparing effect, that can cause daytime sleepiness, exhaustion and connected to them errors or accidents in working. Sleep disturbances are risk factors for several illnesses (for ex.: brain and cardiovascular illnesses, cardiac rhythm disturbances, high blood pressure, diabetes), besides these it's more common in particular psychiatric illnesses, it's described as a symptom of these illnesses.

The screening, in time diagnosis and therapy of sleep – awake disturbances and their consequence the daytime sleepiness put a serious challenge on professionals in the defense forces, law enforcement and at other civilian field of industry, healthcare and traffic.

The increased need of daytime sleep and the chronic exhaustion connected to this can be derived from the distortion of the physiologic sleep – awake circadian regulation, the fragmentation of the sleep – process, the increased need of sleep and from the interactive disturbance of the compound biological clock. The screening of sleep disturbances is extremely important, because that part of the population who is suffering from some kind of primer sleep – disturbance reacts more sensitively to the external factors' harmful effects on sleeping.

The recognizing of sleeping disorders of member of military services has a high importance because tiredness and the inattention - as a consequence can lead to several serious errors and to human and material sacrifices. The armed forces duty involves extremely high risk factors it needs increased attention and the decrease of them can cause the development of serious life – threatening situations. The development of technical background, the decrease of time in reconnaissance, decision making and strikes requires a more appropriate cognitive performance on the level of the individual soldier. The improvement of the near future's military strategy can be characterized not by the new types of weapons but the development of individual soldiers into living human internet – servers according to the leading military specialists. The soldiers of the future can be always connected on-line with specialists from the overseas, can communicate with each other with a facebook – like net and can interact with the inhabitants with the help of an interpreter. Their physiological parameters will be observed with telemetric devices and they'll be supplied with detectors, computerized equipment that can help them in taking control over bigger territories than their former colleagues. The continuous and appropriate evaluation of information, the good cognitive performance as a vital base for the quick and precise decision making is highly influenced by

the sleep disturbances or sleep insufficiencies, so the examination of it is an important health element of the military service and also an important question of military sciences.

Today's military health system is not examining on regular screening the sleeping disturbances or disorders of soldiers fulfilling mission or other armed tasks, contradictory to the well - known fact, that the sleeping disorders are among the 20 most common illnesses on mission duty and after returning home from it. Besides these it's also known that accidents connected to military duties are mainly (in 80-85%) caused by human failure that can be derived from the decline in the level of arousal.

The research problem connected to these could be summarized in the following six points:

1. What kind of sleeping disturbances with what incident could be detected at the members of armed forces (by those ones who are suitable at the ability tests) and what is the rate of symptoms referring to sleep – awake disorders among them?
2. What kind of sleeping disturbances with what incident could be detected at the soldiers competing for mission and what is the rate of symptoms referring to sleep – awake disorders among them?
3. How influences the mission tasks the occurrence of sleeping disturbances?
4. Is it really a quick, effective and simple method to use questionnaires in order to assess sleeping disorders?
5. To what extend is appropriate the questionnaire I have developed and edited to the aim to answer these questions what kind of complementary needed?
6. What kind of help can be provided with the information gained by the screening with questionnaire in order to preserve our staff's health and fighting force?

2. RESEARCH AIMS AND HYPOTHESES

The main aim of my research was to find a quick and easily applicable method that adequately examines the sleeping habits and occurrence of sleep – awake disorders in the staff of armed forces in a high population especially by soldiers on mission or returning from there. At the development of the method that could be applicable at the Hungarian population and the habits of Hungarian mission taking soldiers I could rely on the research results of the Hungarian and international sleeping – medicine besides these on the clinical diagnostic practice of the Sleeping – Laboratory of the Hungarian Military Medical Center. Concluding from these my aims were the following:

1. To make a questionnaire focusing on sleeping habits and complaints that is easily applicable by the population of the defense forces and law enforcement.
2. With the help of the questionnaire to assess the sleeping habits in population fulfilling armed tasks especially in the population fulfilling mission tasks and returning home from there.
3. Based on the answers given to the questionnaires to assess the occurrence of complaints referring to sleep – awake disturbances in the population fulfilling armed tasks especially in the population fulfilling mission tasks and returning home from there.
4. To examine if there's a difference in the occurrence of sleep – awake disturbances and in sleeping habits between the different groups of military and law enforcement.

5. To examine if there's a difference in the sleeping habits and in the occurrence of sleep – awake disturbances before and after taking a mission?
6. To conclude an empiric research in order to determine if there's a change in the quality of sleep and in the occurrence of sleep – awake disturbances while being on mission.
7. To compare the results of my research with the international professional bibliographic data especially with the results of other questionnaire screening tests.
8. To give advices to the further preventive screening based on the results.

I would like to realize the aims of my research with prove of the following hypothesis:

1. I hypothesize that the sleeping habits are mainly genetically determined and based on this there are bigger differences between individuals with different chronotypes in their tolerance and reaction to burden.
2. I would like to prove that the complaints connected to sleep and sleeping habits could be easily and quickly assessed with the use of a questionnaire by the members of armed forces.
3. I hypothesize that the staff considered to be suitable for armed duty – similarly to the civilian population is touched to a high extent with complaint connected to sleeping disturbances.
4. I hypothesize that there are differences in the complaints connected to sleep and in sleeping habits between the different groups of armed forces based on the type of duty, the extent of psychic and physiological burden, besides these under the time of duty the individual's complaints in the same group also can change.
5. I hypothesize that mission duties can strengthen the occurrence of complaints connected to sleep in the Hungarian population similarly to the results of the international researches.

3. RESEARCH METHODS

I have used the following methods while doing my research:

- I have reviewed the Hungarian and the international literature connected to sleep – disorders with bibliographic research and with the use of the internet, besides this I have concluded aimed research in the emphasized topics.
- I have continuously followed the literature in medicine and in military sciences connected to the topic.
- I have systematized and summarized the results and hypothesis of former researches especially those ones connected to military medicine.
- I have studied the questionnaire and instrumental methods used in examining sleeping disorders.
- With the use of examination data of higher amount of patients I have gained experience in the application of different questionnaires. Based on these I have composed the questionnaire that I have used in my scientific research that is founded on the questionnaire have been used in the Hungarian sleep laboratories for years.
- I have systematized and deepened my knowledge and experience on the field of military sciences

- I got a hold of, regularly consulted and cooperated with the professionals and researchers of sleep – medicine both in military medicine and in civilian field either.
- I have carried out empiric with the aimed groups mentioned in dissertation and my results have been evaluated with recent statistic methods.
- In order to analyze and evaluate my results I have used the following statistic methods: chi – square test / Fisher test (for examining distribution), analysis of variance (to compare means in multiple groups) and T-test (for compare means between two groups). I've considered the result to be significant, when the given test's value weren't over the 0,05 level.

4. THE STRUCTURE OF DISSERTATION

In the introduction I show the scientific problem, the relevance of sleep – disorders and their potential negative effects on the quality of armed forces duties, especially on special tasks like missions. In this chapter my aims of research, hypothesis and methods will be also presented. Referring to the international literature I call the attention to the potential risks of sleep deprivation to the sleep –debt, sleep – disorders and their negative effects on cognitive functions.

In the first chapter of the dissertation I show the history of sleep – research and sleep – examination and their relevance on today's researches and practice. I review the significance of sleep as a physiological process, the regulation mechanism of sleep, the characteristics of human sleep and the long- and short-term consequences of sleep – deprivation with emphasizing its military relevance. Shortly I show the genetic relationships of sleep, sleep – regulation and the characteristics of chronotypes. I review the most common sleep – awake disorders and their typical symptoms, clinical features.

In the second chapter I analyze the bibliographic data from the aspect of sleep – debt and its consequences on its most common researched and publicized field at the traffic accidents. I show the work have been carried out at the Military Medical Center's Sleep – Laboratory. I review the effects of military service and mission on health according to the results of an international military prospective study (Cohort Study).

In the third chapter I show the results of my empiric research where I have assessed the complaints connected to sleep in the groups of soldiers carrying out different armed forces duties, missions and after returning from there. I have analyzed the results of the questionnaire with recent statistic methods, summarized them and compared the results of the different groups.

In the fourth chapter I've summarized the results of my empiric research; I show its relevance on military organization, besides these I give recommendation for its application. I give suggestions for the further possible fields of research and examinations based on my results.

5. SUMMARY, CONCLUSIONS

In my scientific research I have assessed the sleep connected complaints and sleeping habits of different groups carrying out armed duties that were the following: soldiers preparing for their mission (222 individuals), staff of the Hungarian Defense Forces Hungarian Military Medical Center (HDF MMC), who have been examined for suitability for being or becoming a soldier, but not preparing for a mission (68 individuals), officers of Komárom – Esztergom county police headquarters (17 individuals) and soldiers returning from mission (29

individuals). Before the examination I have reviewed the national and international scientific bibliography and showed the results of the relevant studies. The data gained from the results of the questionnaires have been analyzed statistically and compared with the summarized national and international data in the dissertation.

The summarized experiences of my empiric research:

1. After analyzing the results – altogether 307 questionnaires - of the first three groups I could draw the conclusion that the most of the group members thought their sleep good, but contradictory to this almost the half of them (49,8%) is tired, awakes in the night (47,1%) and snoring (43%).
2. The distribution of the sleep connected complaints in age and gender in these groups were similar to those ones in the scientific bibliography.
3. The complaints connected to hard to sleep and sleeping through the night were more common by those ones who noted to be tired, but the rate of snoring were higher in this group than the others.
4. I have paid extra attention to the population who has an extra-long sleep – need (9-10 hours), because they are suffering from constant sleep deprivation with the normal 7-8 hours sleeping time. In this group the disturbances in the sleeping through process were higher, but surprisingly no one mentioned snoring.
5. The daytime tiredness were higher in the group of non – snoring individuals than the average, their most common complaints were in the sequence of occurrence: sleeping – through disorder (38,8 – 50%), awake too early (8,2 – 36,4%) and hard to fall asleep (4,1 – 10%).
6. No significant relationship could be found between the noted sleeping time and the sleep connected complaints neither in those questions considered to be evident, such as the sleep – dependent respiratory disorder or the increased need of sleeping.
7. After the mission all of the sleep connected complaints showed statistically significant destruction.

6. NEW SCIENTIFIC RESULTS

After summarizing the results of my research I could consider as new scientific results the following:

1. I have confirmed with empiric research that at a great part of the staff of the armed forces that're considered to be suitable for duty has some kind of sleep connected complaints. These strengthen the assumption that sleep – disorders also need to be screened in the suitability tests.

2. I have showed that the ratio of those ones complaining about daytime tiredness is extremely high that means a special risk factor from the aspect of duties and needs further examination.

3. I have confirmed with empiric research that the sleeping habits were different of those ones who were suitable for armed duty I have called the attention on its genetic background and to the psychic variables connected to the different chronotypes. Ignoring these factors could mean a high risk factor from the quality of carrying out the duty.

4. I was the first to carry out a study similar to the Millennium Cohort Study on Hungarian population, where besides the original examination I could show statistically significant decline in the sleep – connected complaints after returning home from mission.

7. SUGGESTIONS, RECOMMENDATIONS

1. I recommend filling out the questionnaire at the first suitability testing for the armed forces position in order to gain a complex picture of the individual state of health and using it regularly on screening it.

2. I also recommend taking it by those soldiers who are preparing for some kind of extra burdening task, duty both psychically and physically such as mission duty.

3. I recommend introducing the questionnaire to the instructors helping in the preparation for the mission, to the commander and to the staff of the health specialists.

4. I recommend familiarizing the health specialists of the armed forces, the instructors and the commanders with the consequences of sleep deprivation and with the genetic background of sleeping habits.

5. I recommend examining those ones in the sleep – laboratory who's considered to be especially in the high risk group when planning to introduce the screening test.

8. FIELDS FOR FURTHER REASEARCH

To differentiate in diagnosis between the primer sleep disorder and temporary, situative sleep disorder in the high risk population.

The detailed familiarization of sleep disorders' physiological and applied psychological background with the marking of the possible professional specifications.

The more detailed disclose of cause – and - effect relationship between sleep – disorders and their consequently appearing somatic complaints.

The more detailed disclose of cause – and - effect relationship between sleep – disorders and psychic burden.

9.PUBLICATIONS AND PRESENTATIONS

Presentations:

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2. Vida Zsuzsanna: Speciális alvászavarok a napi gyakorlatban (Alvási Apnoe Szimpózium, Margit Kórház, Pásztó, 2008 április 23.)
3. Vida Zsuzsanna: Az alvásfüggő mozgászavarokkal kapcsolatos terápiás elvek és gyakorlat (Magyar Alvástársaság V. Kongresszusa, 2008 november 7-8. Hajdúszoboszló)
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2. Dr. Vida Zsuzsanna: A Parkinson-kór korai kezelésének jelentősége és farmakoterápiája (WEBDOKI 2007/5)
3. Dr. Vida Zsuzsanna: Az alvászavarok kezelésének korszerű elvei (WEBDOKI, 2008/1)
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2. Vida Zsuzsanna, Szakács Zoltán: A nyugtalan láb pramipexole kezelésének tapasztalatai (Ideggyógyászati Szemle, 2007:60 (1-2): 15-22)
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