

OBJECTIVE METHODS FOR ASSESSING THE OCCUPATIONAL STRESS. INDICATORS OF CARDIOVASCULAR REACTIVITY

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Abstract: According to the European Commission Guide, occupational stress is a complex of emotional, behaviour and psychological reactions to the noxious and adverse aspects of work contents, organization and environment. Therefore, occupational stress prevention at work is the main objective of all executives: labour medicine physicians, employers, work security engineers and of each employee. Below, I will discuss the significance of the cardiovascular indicators I have used in a research on the occupational stress among the professional child minders; the increase of the cardiovascular reactivity in the investigated people suggests that this occupation is a permanent distress source, allowing the objective assessment of the occupational stress.

Keywords: occupational stress, professional child-minders, cardiovascular indicators

Rezumat: Potrivit Ghidului Comisiei Europene, stresul reprezintă un complex de reacții emoționale, cognitive, comportamentale și psihologice la aspectele nocive și adverse ale conținutului, organizării muncii și mediului de muncă. Prevenirea stresului în muncă rămâne o problemă care trebuie să stea în atenția tuturor celor responsabili: a medicului de medicina muncii, a angajatorului, a inginerului de securitatea muncii, a fiecărui salariat în parte. În cele ce urmează sunt analizați indicatorii cardiovasculari utilizați de subsemnata într-o cercetare a stresului la asistenții maternali profesioniști; creșterea reactivității cardiovasculare arată că această profesie este generatoare de stres și permite totodată evaluarea obiectivă a acestuia.

Cuvinte cheie: stres profesional, asistenți maternali, indicatori cardiovasculari

Occupational stress is on the second place in terms of frequency regarding the occupational pathology, after the posture disorders, in the European Union. Studies show that stress affects one third of the employees of these countries. It is encountered at all levels of organizations and generates high costs for individuals, companies and society. In order to limit the workplace losses, it is very important that, after the establishment of resources, to evaluate the occupational stress at the level of the organization.

Next, I will present the cardiovascular indicators used as objective methods in a personal research for assessing the occupation stress in the professional child-minders. There were 70 subjects, participating in the study. The majority were women (87%). Out of the total number of participants, 35 formed the studied batch (called the "case"), that is the group of the professional child-minders who take care of one handicapped child, while the rest of 35 participants represented the witness batch, made up of the professional child-minders who take care of a child without any handicap.

In order to study the differences between the two batches, they were considered as independent batches. For the numeric variables, I used the T test.

The average age in the case of the studied batch did not vary significantly from the witness batch. The average age of the studied batch was of 48,943 years, against the witness batch, which was of 49,371 years ($p>0.05$).

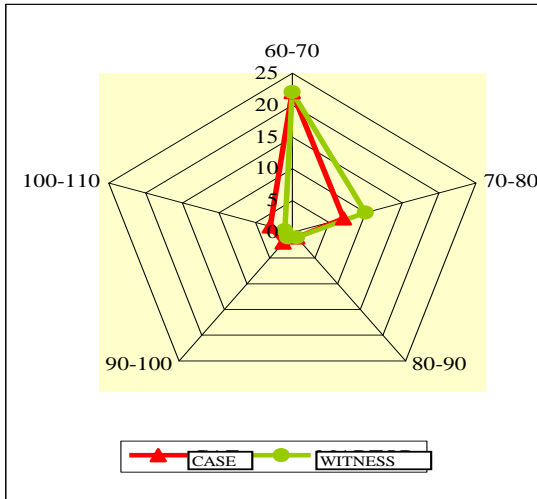
All participants were submitted to the following measurements: the pulse in clinostatism and orthostatism, EKG (any pathological alteration of the EKG was taken into consideration when analysing the data). The posture, which studies the alteration of the pulse and of the arterial hypertension, resulting from the transfer in orthostatic posture, represents the Crampton test, with the homonymous index, which was re-codified in a categorical variable (under 50 = insufficient adaptation; 50-75 = weak adaptation; 76-100 = good adaptation; over 100 = excellent adaptation). The posture test that has in view the difference of pulse that results from the transfer of the patient in the orthostatic posture is represented by the Teslenko test. The values correspond to certain indicators which can be found in two tables (one for men, the other for women) and may be interpreted as follows: 0 - 4,5 = weak cardio-vascular functional capacity; 5 - 8 = good cardiovascular functional capacity; above 8 = very good cardiovascular functional capacity. These values of the Crampton and Teslenko indicators are correlated to the tonus of the nervous and vegetative system.

Results:

The pulse in clinostatism did not register significant differences between the two batches ($p>0.05$), but the pulse registered 90 beats per minute (moderately increased value) in most of the cases, while in the

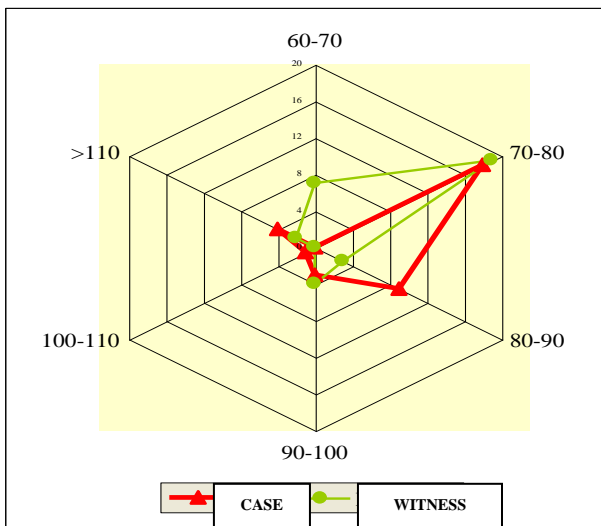
majority of the witnesses, the value of the pulse was below 80 beats per minute (normal value). (picture no. 1).

Picture no. 1. Repartition per categories of the pulse values in clinostatism regarding the two batches



The pulse in orthostatism was higher in the case of the studied batch, as against the witness batch (86 beats per minute as against 79 beats per minute), the difference of 7 beats per minute being significant from statistical point of view ($p < 0.05$). The values of the pulse in orthostatism in the majority of the cases were above 80 beats /minute, while in the majority of the witnesses, the values were below 80 beats / minute. (picture no. 2).

Picture no. 2. Repartition per categories of the pulse values in orthostatism regarding the two batches



In conclusion, the values of the pulse in the studied batch were higher than those of the witness batch.

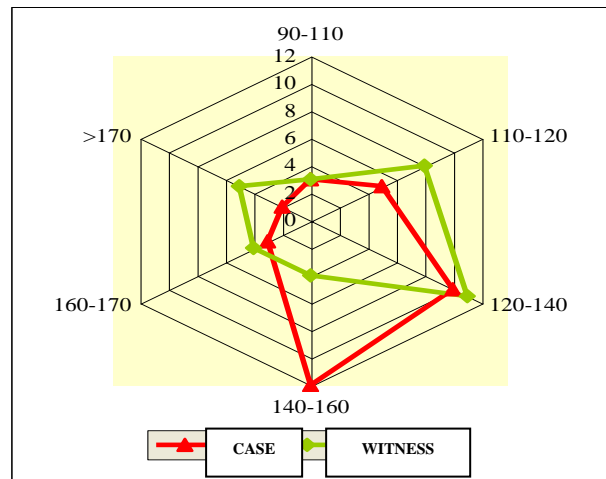
Systolic and diastolic tension measured in orthostatism posture did not record significant differences between the two batches ($p > 0.05$).

Afterwards, I have analysed the repartition of the studied and witness batches taking into account the systolic and diastolic tension, with the following results:

- The majority of the **systolic** arterial tension in

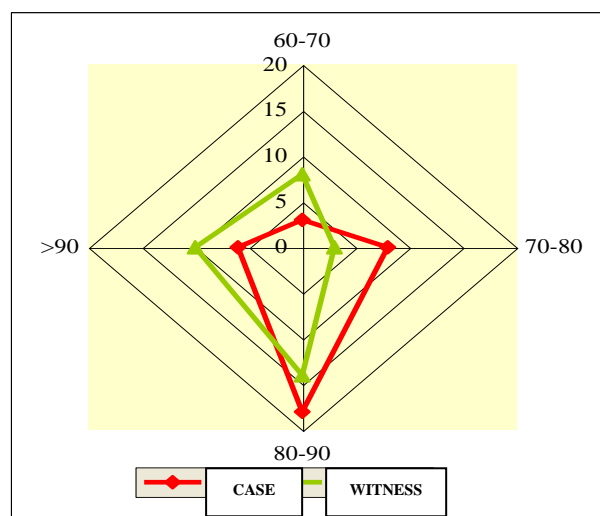
orthostatism in the studied batch exceeded the value of 140 mmHg (being considered arterial hypertension); in the witness batch, the systolic tension was below 140 mm Hg (the group between the values of 120-140 was considered to be likely to develop arterial hypertension, or it was called pre-hypertensive group). (picture no. 3).

Picture no. 3. Repartition per categories of the systolic arterial tension in orthostatism regarding the two batches



- The majority of the values of the **diastolic** arterial tension in orthostatism were above 90 mmHg (arterial hypertension); in the witness batch, it was below 90 mmHg (the group between the values of 80-90 mmHg, regarding the diastolic arterial tension was considered to be likely to develop arterial hypertension, or it was called pre-hypertensive group).

Picture no. 4. Repartition per categories of the systolic arterial tension in clinostatism regarding the two batches

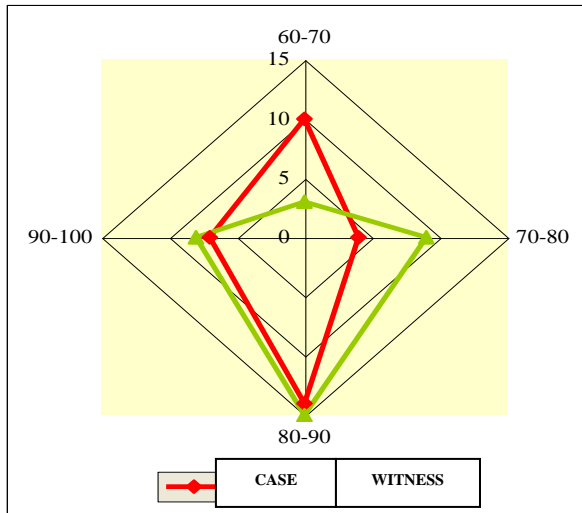


The majority of the values of the **diastolic** arterial tension in clinostatism in the studied batch was above the value of 80 mmHg (maximal limit of the

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normal diastolic arterial tension); regarding the witness batch, it was below 90 mmHg (the group with the values of the diastolic arterial tension between 80-90 was considered likely to develop arterial hypertension, or it was called pre-hypertensive group). (picture no. 5).

Picture no. 5. Repartition per categories of the diastolic arterial tension in clinostatism regarding the two batches

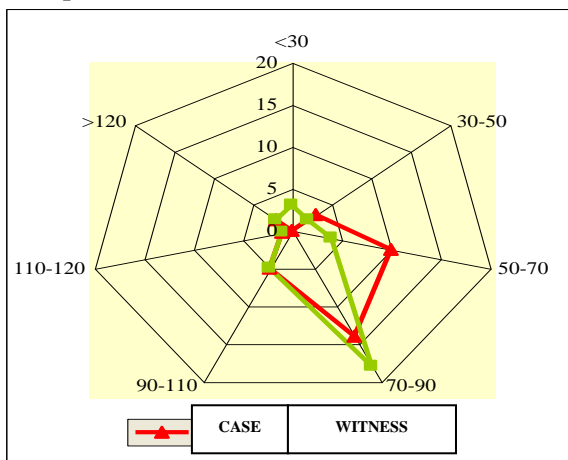


By analysing the previous four graphics (pictures 3, 4 and 5), we may draw the conclusion that, the majority of the persons of the studied batch are considered pre-hypertensive or even hypertensive, while most of the witnesses register normal values of the arterial hypertension or they are considered pre-hypertensive.

Crampton index

The majority of the cases registered values below 70 (the adaptation of the transfer from clinostatism to orthostatism was weak or insufficient); regarding the witness batch, the majority of the values were above 70 (good or excellent adaptation). (picture no. 6).

Picture no. 6. Repartition per categories of the Crampton index values in both batches.



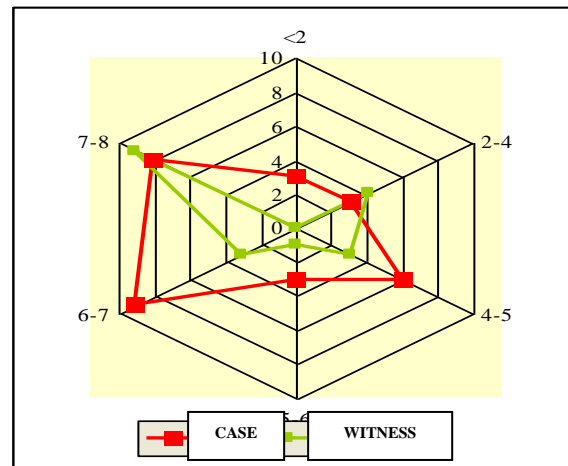
The analysis of the previous data showed the fact that Crampton index depends on the value of the pulse

measured both in clinostatism and in orthostatism, the dependence being accomplished in the same sense.

Teslenko index

The comparison of the values was made with the help of the T test for the independent samples and revealed a lower index than in the case of the studied batch (the case batch), as against the witness batch: 5.98 as against 7.31. The difference, in favour of the "case" batch was significant from statistics point of view ($p < 0.05$). (picture no. 7)

Picture no. 7. Repartition per categories of the Teslenko index values in both batches



In the majority of cases, Teslenko index was below 6 (cardiovascular functional capacities were relatively good or weak), while the majority of the witnesses recorded values of the Teslenko index above 6 (good or very good ventilation capacities).

The analysis of the previous data revealed the fact that Teslenko index depends on the pulse variable, which was measured both in clinostatism and in orthostatism, the dependence being accomplished in the same sense.

EKG

The studied batches were also compared from the point of view of the EKG alterations. Thus, a number of 12 persons, out of the total of 35, recorded pathologic alterations of EKG in the studied batch (the "case" batch), in comparison with 5 persons, out of a total of 35 of the witness batch (see the table below).

Table no. 1. Contingent table with the situation of the EKG alterations in the case and witness batches.

BATCH	EKG_		Total
	ill	healthy	
Case	12	23	35
Witness	5	30	35
Total	17	53	70

In the case of the previously described situation,

I estimated the Odds ratio for the two groups and I obtained a value of 3.13 – value, which is unfavourable for the case batch. Thus, the persons who have in their care, children with handicaps, register three times higher probability to develop cardiac pathology (diagnosed through EKG). Though, the variation interval of this estimated risk included the neutral value 1 (minimum 0.966, maximum 10.149), suggesting that the estimated value was not significant, statistically speaking. The noticed risk difference was at the limit of the statistic significance.

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