

Work Organization, Mental Health and Coping among Firefighters: The Brazilian Context

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Abstract Military firefighters are professionals properly equipped and trained to attend emergencies aid. Such situations may start with the pressure of work and daily living with life and death. Some of the consequences, both physical and psychological, may affect these professionals. The present research aims to study the firefighters work routine and its relation to health; identifying their perceptions about the relation between work and health and their coping strategies. For this purpose, we conducted semi-structured interviews, with 8 firefighters of a corporation located in the North region of Rio Grande do Sul – Brazil. The choice was made due to the fact that the institution has an important role, attending to more than 100 cities in the State. The collected material was recorded and transcribed to further content analysis, preserving the participants' anonymity. The collected responses expose the necessity of coping is present due to the routine presence of situations about the borders between life and death, the search for the apparent calm they may present during their work, as they need to assist victims under any circumstances. The most used strategies were the emotional denial (aiming the firefighter as a "hero" role which needs to help others), trivialization of feelings (through an understanding of stress as a work routine) and, to a minor extent talking with others (through the experiences changes and resignification). On the other hand, the work was perceived as "rewarding". Although, it may lead to various physical and psychological consequences, mainly the stress and psychosomatic, linked with spinal diseases, paying attention to the fact that there are no work supporting organizations to share feelings and experiences, forcing firefighters to create their own strategies. We highlight the importance of offering emotional support organizations to firefighters, especially for sharing traumatic experiences, contributing to their mental health.

Keywords Firefighters, Stress, Coping, Work Organization

1. Introduction

Firefighting is an old work, being official in Brazil in 1860 [1]. The fire department is responsible to save lives and material goods in dangerous situations. It is also its responsibility to plan, organize and control all their operations and subordinate unit ones. For this, and many other reasons, it is noted that these professionals live constantly exposed to physical and psychological problems, which can compromise their emotional stability that is extremely necessary in firefighter work, mainly through risk situations. These situations may trigger a chain of feelings related to stress and anxiety that can lead to physical and emotional psychopathologies [2]. The fire department is not only responsible for firefighting, but also for protecting and saving lives and material goods during emergencies, and some of these cases are considered high risk activities, and not uncommonly, putting in danger the life of the

firefighter. Therefore, in these cases is evidence of the support that this professional must give to assist individuals, becoming necessary to comprehend the coping strategies used in such situations.

Due to the nature of the occupation, it is understood that some risks are essentially bonded to the firefighter work, such as physical and biological risks, due the contact with blood, and exposure to substances and extreme high temperatures, among other factors. Therefore, poor work conditions can result in higher risks. Some researches evaluating Brazilian firefighters have verified the predominance of some unfavourable working conditions factors. In a research, conducted by Nunes and Fontana [3], it was found that the subjects reported appropriated physical spaces, but insufficient recourses, both human and material, working tools, vehicles, and personal protective equipment. As pointed out by the results of Monteiro et. al [4] the lack of resources, added with the lack of technical recycling training are negative factors of working conditions for such professionals. Another highlighted factor was the distress, physical and emotional, faced by firefighters during the work. In addition, it was identified in the surveyed firefighters the need for improvements in wages and

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working equipment. However, additional research is needed to delineate the needs and perceptions of these professionals.

According to the International Classification of Diseases - ICD-10 [5], somatization disorder has a main aspect of physical symptoms that have no basis in scientific findings, and appear related with persistent need for medical investigations. Commonly, individuals resist to attempts for discussing the possibility of physical symptoms caused by psychological issues, even when the beginning of it coincides with the unpleasant life events, difficulties or conflicts.

The psychosomatic approach, according to Mello [6], is a research field about getting sick, health and its practices, comprehending the mind-body relationship and the complexity of causes and effects present in the illness evolution. Psychosomatic medicine, according to this author, covers three integrated perspectives: the disease and its psychological dimension, the doctor-patient relationship, and therapeutic action focused in the diseased person, which is a biopsychosocial being. After a situation that causes a great impact on the individuals mental health, is common some reactions arise after it happens, but usually the most severe trauma is expressed in medium and long term through comorbidities such as depression, phobia, anxiety and alcohol and drugs abuse [7].

From the 20s the term stress started being used to refer to the syndrome that covers a number of symptoms that the patients have when faced with situations that require their body to adapt to face them [8]. Selye [9], argues that there are three phases in the stress biological development, which are: alarm, resistance and exhaustion. These three phases compose the General Adaptation Syndrome, named by Selye, and consists in a series of nonspecific responses manifested in the body during some situation, requiring effort, including psychological, to adapt.

Assuming that the term stress has a sense of the deformity degree suffered by a structure when subjected to external forces, Lipp and Novaes [8] show that the stress phenomenon cannot be considered good or bad, but only an individual response to stressors, which are often associated with negative aspects. However, the authors argue that people are not helpless victims against the stress, and they are able to create a way to cope and minimize their negative results. For coping properly with stress, Suls, David and Harvey [10] described coping as a concept that considers the way people deal with difficulties and stressors. Such coping strategies (or adaptation modes) consist in an attempt to promote efforts to conserve, protect or recover their valued goods in front of a threatened or actual loss.

In a study with a sample of 441 male firefighters, Murphy and cols [11] it was observed that 33% of the sample met criteria for lifestyle risks and 53% met criteria for lifestyle concerns. The stressors presented negative correlation with job satisfaction and lifestyle factors, and a positive correlation with job stressors and years as firefighter. Another study, conducted by Bos and cols [12]

with 1,624 firefighters and 630 office workers at the same fire departments in different regions of the Netherlands, it was found that firefighters reported more complain complaints and disabilities resulting from back complaints than office workers. Also workers highly ex-posed to 'energetically demanding activities had a higher risk of subjective fatigue. Office workers reported more rates of hypertension, stomach, heart, neck, shoulder and arm complaints.

Slottje and cols, [13], in a research with firefighters exposed to an air disaster 8.5 years before the study, evaluating 334 exposed firefighters and 194 non-exposed colleagues; it was found that firefighters who rescued people, cleaned-up, or witnessed the immediate disaster scene reported a significantly lower physical and vitality rates of life quality and than non-exposed worker. Barros and cols. [14] also found that among a sample of 303 firefighter, 51.2% reported sleep disturbances. Also, psychological distress, somatic alteration, suicidal ideation and unhealthy alcohol use were risk factors for this disturbances among firefighters. In a study with 202 firefighters, Pestana e cols [15] identified that firefighters with initial symptoms of Burnout Syndrome also presented more negative impact in the life quality perception. In a sample of 60 firefighters, Silva and cols [16], found that 56,7% of the sample presented had mental fatigue and 81,7% muscle fatigue; 18,3% have suffered some sort of accident nevertheless 10% have been reported; 68,3% answered that they did not have have received some guidance on ergonomics.

This paper aims to study the work of military firefighters and the relationship between work and health in the occupation; aiming to understand their perceptions about the work consequences to health, identifying coping strategies.

2. Methodology

The present research is a qualitative study, which the number of participants was established by saturation criteria. The chosen local for research was a Regional Fire Department (RFD) located in a town in the northern region of Rio Grande do Sul. RFD was chosen due to the fact it has a significant role, attending to more than 100 cities in the State. The research was sent to the Research Ethics Committee of Faculdade Meridional IMED.

Still, we collected signatures from the voluntary participants in the Free Informed Consent Term according with the law 196/96. The exclusion criteria of the study was firefighters under 18 people, individuals who do not work at the fire department or working in the corporation exercising a non-military function; and retired firefighters.

The data collection began by conducting a focus group, which, according with Barbour [23] is a tool based in generation and analysis of interaction among group participants, which discuss about a subject brought into focus from an active stimulus, which is formulated

according to the objectives of the researcher.

We conducted semi-structured interviews after delineating the main issues through focus group. The interviews were conducted at the fire department, during the work shift, from questions made to each participant. Each of the individual meetings lasted about an hour.

The interview was structured via planning guidelines about the military firefighter of his work; seeking to assess professional perceptions about the consequences of their work to health and their coping strategies. After the interview, result integration was made, aiming to maintain the research focus.

3. Results and Discussion

All subjects were male, married, with average age of 39.29 years and the duration of employment in this field, the average was mean time profession of 18 years. Regarding the work hierarchy position, three were sergeants and five were soldiers. Only two of the participants joined the corporation for less than 15 years, six others were working in this profession over 20 years. The eight firefighters volunteered were identified in the survey as subjects 1-8.

The results were described and organized in the following categories: physical and psychological in Perception during and after events; Working conditions; Preventive action; and Professional Coping Strategies.

3.1. Physical and Psychological Perception during and after Calls

When asked about how they felt physically and psychologically after attending to calls, it was observed that although they felt exhausted due to the physical effort, they claimed to have achieved relieved and happy feelings, and a sense of mission accomplished as illustrated by Subject 5 "Depending on the occurrence, sometimes you get physically exhausted, but when you do what you like, you can even be exhausted but you are going to be happy" and subject 8 "I feel accomplished. Imagining that, I was part of such a thing! Can you understand? I saved that little old woman of being paralysed; I took people from vehicle wreckage. (...) So we feel fulfilled. ". The present data is according with the results obtained by Natividade [2], even perceiving that the profession is highly stressful and dangerous, when asked about their feelings during these occurrences, highest responses were satisfaction, and sense of accomplishment. Therefore, it is clear that, although there are difficulties and great necessity of physical effort in the services performance, the profession achievement is a factor that stands out in the obtained reports.

Regarding the most common physical symptoms of firefighters, both experienced as observed, the most part reported perceptions related to spinal problems, as illustrated Subject 4 "Backache, and everything involving the physical part, the majority of colleagues working in the

operational function always have some pain, and some is not only pain, is a diagnosis already"; and Subject 1: "what we have the most is here is backache problems. I believe that is due the nature of our service ". However physical wear is ignored sometimes, as said by Subject 7 "When there is a need to meet an occurrence we do it, we will not say "ah, I will not do it, because it hurts me", so we forget the pain, you know? You will treat, operate and see the consequences only after, and this is our way to do it, for several years. If I need to help to put a ladder I cannot say "oh, I cannot", because the only excuse is if you don't have an arm or a leg. According Dahlke [24], in the psychosomatic bias, the support and body dynamics are connected. According to the author, the column has the task of providing support, elastically stop the life threats, ensuring mobility, as well as load / support the weight of existence.

From the data, it is perceived that firefighters feel the "weight" that they carry, as much of its own existence as others, expressing the threats of the profession in a physical way, because they are responsible to carry and support people, both in physical psychological ways, during difficult situations of loss; keeping it stable. It is assumed that these symptoms decrease as the subjects express the "weight they carry in their back" in a more effective way, which does not generate any bodily or psychological injury. Also, this result is according with the findings of Bos and cols [12] mentioned earlier, that shows backache as a common problem among firefighter; and Silva and cols [16] that found a 81,7% rate of muscle fatigue among firefighters

Regarding the difficulties, the firefighters emphasized experiences related to death, both known and unknown victims, especially children, as reported by Subject 2: "Thank God well never got accident with child victim. I think if I get an accident that has child trapped in wreckage or dead, I think I will ... I will get it, but it will be ... sad. (...) However, with adults I feel normal! I already have so much time to prepare, and we are used to it you know, so we ... I feel normal. ", something also mentioned in the focus group. Death, as pointed out by Fischer et. al [24], is seen in Western culture as something 'unnatural', unpronounceable or on which it is not necessary reflect, since it involves breaking affective bonds, loss of roles and mourning. Therefore, the author explains death ends up taking a connotation of failure to the team, as though prevent it was their responsibility. The death generates helpless and frustration feelings for those professionals whose activities are especially linked to life and death.

Several times, Firefighters also have the suffering feeling of victims and their families, since they put themselves in these people's role, reflecting on what they would do if such a tragedy happen to them or their families, as said by subject 7: " A fireman can experience everything about others desperation. Who had never been in situations like losing a family member or a loved one due diseases or something, will have that feeling of... lost, no one wants, so is needed to support; is a situation that you must live with

(...) It will give to the fireman some affliction, because it afflicts the emotional part of people, it can cause desperation”.

Also, we note that death unsettles firefighters, as illustrated by subject 5 “I get very distressed many days after diving to rescue the body, I get very anxious at home, sometimes, sometimes change my humour really fast, I get happy and suddenly I turn sad (...) so there is someone talking to me and I turn angry abruptly.”. However, the recurrence of this kind of experience eventually becomes routine, leading them even to conformity, as part of firefighters’ job to witness death scenes, as said by Subject 4- “What we can’t stop thinking about are situations when we see a people suffering strongly. (...) These situations that stuck with us, so in your daily routine (...) you see a child or remember any fact that reminds you about that day, during your everyday life is so complicated. (...) But that’s part of the profession, you know, tomorrow is another day, and two days by now we will have another occurrence”. The data corroborates the findings of Bezerra [26] in which 33% of the studied firefighters sample showed some level of stress, even though these professionals present a good mean of life quality on work. Monteiro *et al.* [4] confirm that these professionals live constantly with a strong emotional charge during the work routine; in events involving victims, they often end up facing death or witnessing shocking scenes. The authors also point out that, after the occurrence, the firefighters end up going back to their activities without any support to help them to cope with such situations that even are routine, are no less traumatic; leading firefighters to act as if nothing had happened, being ready to meet a new calling. Also, Silva and cols [16] found that 56,7% of a studied sample of firefighters presented mental fatigue, also Murphy and cols [11] results shows that the job stressors presented negative correlation with job satisfaction among firefighters

Tamayo [21] states that human service professionals (among them, nurses, doctors, psychologists, police officers and firefighters) coexist with emotional overload due to the link between them and the people they serve. Coping with the stress and the emotional demands at work, there are two ways of dealing with these issues: functional and dysfunctional. At the functional way, the individuals can distance themselves and maintain their motivation and performance in an appropriate way; however, in the dysfunctional way, the subject loses concern and interest for its service users, interacting with them as if they are objects, not people (depersonalization). Thus, some false inferences and wrong evaluations, leading professionals to blame people who need their services or themselves for the situation they are experiencing, instead of questioning the workplace responsibility. From the points made by the author, it is assumed that firefighters are facing the demands of their work in a functional way, as the occurrences become common, carrying out their work in an assertive way.

3.2. Working Conditions

To get a better performance at work, it is essential that the firefighters have the correct equipment for each occurrence available. When asked about this, the firefighters reported that the number of devices is according with what they need for their activities. However, for their work execution to become more efficient, it would be more appropriate if they had more advanced technology in their equipment, as illustrated by subject 5 “We are third world, so our equipment here is more than just precarious. (...) One of the equipment pieces we miss the most is communication equipment that would be helpful to us (...) some light to illuminate while diving too.” It is remarkable the firefighters’ opinion of the lack of workers in the corporation, leading the Fire Department to act with a low number of professionals in their activities; as illustrated by Subject 1 “I remember when I was a kid and firefighters were in front of the Fire Department to get money to buy equipment. Now it is reversed, we have enough equipment. However, the number of firefighters decreased. Formerly the fire Department had 3, 4 people to do a job, now we have two, sometimes one.” and Subject 8 “20 years ago when I started (...) were 10 men to a city with 100 000 citizens, it were one thousand citizens per firefighter, is not it? Nevertheless, today, there are 200 thousand to 5 firefighters! So if analyse it is 40 000 citizens per firefighter!”. Therefore, it is presumed that even if the corporation has enough equipment (nonetheless, it can be improved and updated), there is not enough firefighters to act in instances, since the team ends up being less than adequate for meeting the demand. In research done by Natividade [2], the lack of equipment was reported by 3.3% of subjects as one of the possible improvements to be made. Also the results of Monteiro *et al* [4] and Nunes and Fontana [3] highlighted insufficient materials and human resources, added to the lack of technical training and retraining, and physical and emotional exhaustion as work negative points.

With a suboptimal number of workers and technological equipment, improvisation is part of firefighters’ work routine. In order to work properly, the training and techniques knowledge is essential, as said by Robb “We need to try to stay calm. We need to know the techniques and the tactics. In addition to practice because practice makes perfect. (...) We need to listen to other co-workers near us. Because suddenly a person could have a better idea, two think more than one”.

Improvisation occurs in so far as it must solve a problem using all the knowledge, techniques and previously received training. Improvisation is not something uncommon as pointed out by subject 7, “We work in this way, and I will not tell we are like McGyver or something, we don’t create a bomb, but we improvise, but we need to improvise in a properly way, being agile, you know, we need a quick solution.”

And by Subject 3: “sometimes we have to improvise, we are not supposed to do it, but often we need to think quickly,

and we focus in the moment and sometimes do not even think that we can get hurt, that something can happen to us, we just do it. It happens, unfortunately it happens'; and as pointed out by subject 4, although it is usual, this practice is questioned by the professionals themselves: "If you do not have a very good technical knowledge, so you have to improvise, but so we think "ah, I improvised, it will solve" and it usually will resolve, but after we did it we think "But doing this I do not put the group and myself at risk?". Subject 5 also points that it is bounded with the own country culture "I believe that Brazil, for always have been had precarious conditions we can do the job as any other firefighter out there, and if we can't it's not due lack of race, willpower or technique, but due the lack of equipment, because we do not have the same technological resources."

These results are in accordance with what is called "Brazilian jeitinho" (or Brazilian way), that as indicated by researchers, is defined as a cultural aspect of the country, represented by behaviour and strategies to solve problems that have positive and/or negative equivalence [22]. Thus, it is understood that as professionals responsible to rescue and save lives, it is required to have proper resources however, due to the report we note that such shortage is already part of the organizational culture, and since it is governed by public agencies, it seems to permeate a significant part of the Fire Departments in the country. Another important observed fact is that the majority of respondents were working in the administrative part of the department, not due to their own motivation, but due back problems. The working conditions can influence not only the performance but the work motivation, as the physical consequence can lead to a deviation function. Also, the results of Silva and cols [16] shows that 68,3% of the studied sample of firefighters answered that 18,3% have suffered some sort of accident however 10% have been reported; and also they reported that they did not have received some guidance on ergonomics.

3.3. Coping Strategies

In the report of the sample, it was found that to the respondents majority the coping occurs as they become used to the routine interaction with matter of life and death and the pursuit of "cold blood" that they should have during their routine, to help victims under any circumstances. Natividade [2] obtained some data on this issue, 3.8% of firefighters from his study indicated loss of emotional feeling as one of the changes after their beginning in the corporation activities due to the constant exposition to many accidents and the need to learn how to deal with it in their professional routine. This loss can cause numerous consequences on the quality of life of these professionals that need to find a way to express the emotions experienced in their activities. Limongi-França e Rodrigues [23] states that it would be nearly impossible to list all the possibilities of coping. However, the authors points that are the combinations of stressors, and how each one faces it is characterized by a completely individual response, and

should be evaluated to manage the stress.

The question about ways firefighters face and recover from numerous impactful scenes which they experience at work vary widely, as illustrated by subject 4; "Each one of us has an own way, like go to the forest, stay silent, exchange experiences, we talk after returning from occurring, or later a colleague asks if you have ever had to work in that instance, and when talking about professional experiences you perceive that the other one also had a similar experience, it is part of the job "; Subject 3 "During the situation We are emotionally affected, but after you go back to the routine and we get over, we think 'no, it's my job, tomorrow it may or will happen again'. You know. You will get used on a daily basis "; and in the case reported by subject 6 "I had a situation when I had just started, I saw a person having a heart attack, we revived her for some minutes but she died. Then is that thing ... you start to think, 'hey, what if I had done this or that would it not save her?'" Maybe the five minutes I missed checking the vital signs and calling to the fire department, waiting for the car to arrive and instead I had come with my own car she might has more time to live, you know? This is a question that I can never figure out. It is a frustration, a feeling of helplessness, knowing that I did my best and it did not work, I failed. So we learn from these kind of things". Thus, we note that there is no specific guidance for how to deal with the emotional effect of such work, leaving the firefighters without professional support for difficult situations. The most common coping strategies were emotional denial (aiming to achieve the role of firefighter as 'hero' that should help others), the trivialization of feelings (through an understanding stress as a profession routine) and in a lesser extent the conversation with others (through the exchange of experiences and reframing).

In an intervention-research by Murta and Tróccoli [24], the identified major sources of stress for firefighters were the work organization (42.5%), working conditions (38.3%), interpersonal relationships (12.8%) and work-family conflict (6.4%); significant data on coping strategies were also found, i.e., the way firefighters faced difficulties, stressors, threats or actual losses in order to maintain, protect or recover the elements they value. In this research, the authors highlighted the adaptation modes are focused on emotion (behaviours and/or thoughts to mitigate or remove the emotional effects of stressful situation thoughts) and focused on the issue (behaviours and/or thoughts to directly support the stressful thoughts about the situation). Moreover, the results of Van der Velden et al. al. [25] points that there is ample evidence of relation between exposure to disasters and post-traumatic symptoms and problems, suggesting that as a way of coping, firefighters can be negligent about their own health due the terrible consequences of disasters for those involved in the situation, to which firefighters must assist.

It is noteworthy that a presence of a psychologist in the corporation, due sporadic statements pointing to the need for psychological support. As pointed out by subject 6: "I'll

be honest with you, it's hard to accept that we need to talk to a psychologist. It is not like 'ah, now, like a dentist appointment, I will mark with the psychologist'. We will not, and if we will, it will be just in case that we are bad at. It will be good if we have someone that suddenly says "Let's drink a 'mate'" and asks "how was your service today?". Thus, if the psychologist was part of the routine of fire department, it could assist them and maintain a therapeutic relationship in a much more effective way, considering the work reality of these professionals. These reports indicate the need for help, since there is evidence of psychological help as a tool to combat stressors for firefighters [26].

4. Conclusions

The main focus of the present research is to try to understand the consequences of the work done by firefighters, especially regarding psychological, psychosomatic and or stress-related issues and what resources they use as a coping strategy. The most used strategies are emotional denial (targeting the role of firefighter as hero that should help others), the trivialize feelings (through understanding stress as profession routine) and to a lesser extent the conversation with others (through the exchange of experiences and reframing). These findings support the previous research that refers the presence of backpain, physical and psychological fatigue among firefighters

Regarding the implications of firefighters work consequences to these professionals, it was noted the presence of insensitivity, or "cold blood", that firefighters often need to develop along their profession. This may affect the quality of life of individuals working in the corporation because, several times, they end up not expressing feelings caused by traumatic events. Due the fact that they are not prepared to face this, the subjects tend to act rationally, avoiding facing their feelings. Therefore, it is perceived the importance of psychology practicing in the Fire Department, in order to monitor the daily work of firefighters.

Thus, it was verified the firefighters need to improvise during their work several times, during attending calls; they should act in an active and initiative manner, finding other means of solving the problem. Due the fact that it is required to resolve the adversity at any cost, a great responsibility becomes part of the daily firefighters routine, who demands too much of themselves as much, and try to not be sensitive to the occurrences. During its work, they provide assistance to others, they don't take into account specific consequences that they may suffer, which can be both physical and psychological. These findings are according with previous mentioned researches that found a lack of ergonomic training among firefighters another important aspect is the way these professionals prepare their mourning among experienced stressful scenes, while they do not have an effective strategy for its assertive

preparation; this can lead to somatization of not exposed feelings.

About the relationship between work and health of these professionals, it became evident that the emotional distance that firefighters must have with the victims, improvisation and pressure they sufferer, demanding themselves to act with maximum accuracy, as well as the mourning that they have to experience, and the losses they suffer in the occurrences, represent factors that end up interfering in these workers lives. This ends up causing stress symptoms, especially related to the alert phase and resistance in some cases may progress to the stage of almost exhaustion or exhaustion. It is possible the emergence of psychosomatic symptoms, especially spine related.

The lack of technological equipment was identified by the sample as one of the improvements to be made, as this would improve the quality of work and greater flexibility in certain situations, in order to support a more efficient way to perform their job. However, a significant difficulty has been the lack of firefighters in the corporation. On several occasions, the team does not have the ideal number of professionals attending the events, overloading these workers.

The main limitation of this study relates to its regionality, which means that the findings may not apply to every fire department. Further studies in this area may be made in other Brazilian states, to the present research, enabling integrative data for a better understanding about the theme. Another factor to future research are different hierarchical levels within the organization, enabling a broader look on this profession.

After all appointments, it becomes clear the importance of emotional support that should be offered to professional firefighters, especially with regard to traumatic situations experienced by them. We believe the inclusion of a psychologist in the corporation is a relevant factor, to offer support after an occurrence, or even to assist the preparation or during activities. Thus, it becomes important to implement psychological interventions and evaluating the effectiveness of these based on Effective psychological areas. Such interventions can occur through support groups, psychological care in the corporation or even in casual conversations about what happened during the performance of firefighters as well as the feelings triggered by experiences. Thus, we believe that would lead to significant decrease psychosomatic symptoms, which is noticeable particularly in the case of back pain and physical exhaustion.

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