**MÍRA PROŽÍVANÉHO STRESU Z VYSOKOŠKOLSKÉHO STUDIA Z POHLEDU TYPOLOGIE OSOBNOSTI**

**MEASURE OF EXPERIENCED STRESS FROM THE UNIVERSITY STUDIES FROM THE PERSONALITY TYPOLOGY PERSPECTIVE**

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Abstrakt

Stres může v dnešní době na člověka působit z nejrůznějších směrů, oblastí a zpravidla se s nimi člověk setkává v podstatě dennodenně. Cílem této studie je zjistit, jak typ osobnosti studenta ovlivňuje míru prožívaného stresu během vysokoškolského studia. Vlastní šetření se zaměřuje pouze na prezenční bakalářské studenty druhých ročníků konkrétní univerzity, Jedná se zejména o porovnání stresorů a jejich intenzity mezi studenty bakalářských a magisterských programů. Obsahem této studie je rozpoznat, co konkrétně u oslovených studentů vysoké školy vyvolává stres ve vztahu k jejich studiu. Souhrnně lze hlavní výstupy práce shrnout tím, že bylo poukázáno na rozdíly mezi introverty a extroverty při pociťování stresu u oslovených studentů. Prožívaný stres však u poloviny respondentů postupně během studia klesá, což značí adaptaci studentů na dané podmínky a prostředí. Přesto však 22 % respondentů sáhlo kvůli stresu ze studia k užití podpůrných látek.

**Klíčová slova:** stres, neuromarketing. smyslový marketing, eye tracking, marketingová komunikace

Abstract

Nowadays, stress can affect a person from various directions and areas, and as a rule, a person encounters them on an essentially daily basis. The aim of this study is to find out how a student's personality type affects the level of stress experienced during university studies. The investigation itself focuses only on full-time bachelor's students of the second year of a particular university. It is mainly a comparison of stressors and their intensity between students of bachelor's and master's programs. The content of this study is to recognize what specifically causes stress in relation to their studies in the university students addressed. In summary, the main outputs of the work can be summarized by pointing out the differences between introverts and extroverts in experiencing stress among the students addressed. However, for half of the respondents, the experienced stress gradually decreases during their studies, which indicates the adaptation of the students to the given conditions and environment. Nevertheless, 22% of respondents resorted to the use of stimulants due to the stress of studying.

**Keywords:** stress, neuromarketing, sensory marketing, eye tracking, marketing communication

1. Stress

The term stress is used, for example, in situations where the demands to manage the situation exceed the individual's current ability to adapt and a state of non-optimal load on the organism occurs. (Paulík, 2017) Pugnerová and Kvintová (2016) define stress precisely as an over-limit load, which additionally adds a broader concept of stress in the sense that stress currently affects every person, regardless of gender, age or race, and is becoming a key feature of contemporary modern society. They mention that every person is affected by an enormous amount of information, changes and demands on a daily basis, which sometimes exceed the possibilities and limits of a person to handle them without stress. A more physiologically oriented definition is given by Plamínek (2008, p. 124), who explains that stress is "a state of tension with which the human organism reacts to stimuli (stressors)". Another view of stress from the point of view of medicine, i.e. a more professional and illustrative definition, is presented by Adam et al. (2019, p. 98), who states that stress is "a term for a situation in which a living organism exposed to a load (stressors) activates defense responses aimed at maintaining homeostasis and preventing damage or death of the organism". Kučera (2013) describes that stress has the task of preparing an individual's organism for fight or flight, which can significantly contribute to an individual's survival.

The topic of stress is very topical these days, because nowadays people can be affected by variability and the pace of change, the demands that are placed on a person not only at school or at work, but also by fears of failure in a career, fears about their health or that of their loved ones, but also, for example, anxiety about ecological disasters or terrorist attacks. In other words, it can be stated that nowadays stress can affect a person from various directions and areas, and as a rule, a person encounters them on an essentially daily basis. This is followed by Pugnerová and Kvintová (2016), who add that the brain of a modern person functions in the event of danger or stress in the same way as the brain of our ancestors, only that nowadays a person is exposed to a number of different stimuli, while nowadays a person encounters threats that threaten his ego rather than his physical existence. From these points of view, it is evident that the human body reacts to stress and threats with the same reactions and processes, but nowadays people are threatened and stressed by stimuli of a different nature.

* 1. Physiological response to stress

V According to Pugnerová and Kvintová (2016), stress and stress reaction are the organism's response to excessive load, which disrupts the so-called homeostasis or internal balance of the organism. Coates, Ayers and De Visser (2015) explain that Hans Selye in 1956 described the so-called general adaptation syndrome, which represents a specific response of the human body to a stressful situation, and this response has three phases, which are alarm (Helus, 2018 calls it such as shock), resistance and exhaustion. In the case of the first phase, i.e. the alarm, the human body is mobilized and activated, and at the same time Helus (2018) states that adrenaline is secreted, the heart rate accelerates, the breathing rate increases, and at the same time digestion, wound healing and sleep rhythm are affected. In addition, Kučera (2013) adds that there is narrowing of the pupils, sweating, or so-called tunnel vision, when a person narrowly focuses on a local stimulus. Pugnerová and Kvintová (2016) also mention Cannon's theory, which describes the organism's preparation for a reaction, which is either an attack or a flight, while nowadays an attack does not have to be only physical, but also in the form of gossip or irony. As a result of this preparation of the organism, there is a higher blood flow to the limbs and at the same time emotions such as anger, fear or possibly anxiety often appear. (Jochmannová and Kimplová, 2022)

* 1. Stressors

Mukšnáblová (2015, p. 58) defines stressors in general as "an agent, influence, stimulus acting on a person (generally an organism) and causing stress". Zacharová (2017) explains stressors as a negative emotional experience to which the body reacts not only with cognitive and behavioral reactions, but also with physiological reactions. Stressors are stimuli that cause stress in a person, while if a person tries to fight stress, he should try to reveal his stressors. (Pugnerová and Kvintová, 2016)

There are several points of view according to which stressors can be classified. A basic breakdown can be mentioned, namely external and internal stressors. (Zacharová, 2017) Pugnerová and Kvintová (2016) describe that external stressors, as their name already suggests, come from the outside and can be physical, chemical, biological or time-related, such as lack of fluids, irregular lifestyle, excessive emotional load or lack of time, which is a very common cause of stress. In addition to the above, it is worth noting that lack of time can also lead to irregular life management, and this is one of the other stressors. According to Pugnerová and Kvintová (2016), internal stressors are generally based on personality characteristics and include, for example, low self-esteem, anxious personality traits, perfectionism. In addition to the above-mentioned division, the view according to Mukšnáblová (2015) can also be mentioned, which divides stressors into emotional and physical, while the emotional ones include anxiety, worry, fear, expectation or, for example, excessive worry. Among the physical stressors mentioned, the author includes, for example, accidents, injuries, natural disasters, genetic load, pregnancy, changes in the seasons, changes in air pressure, drugs, viruses or air pollution.

We can also mention the so-called stressogenicity of stressors, which is influenced by four factors: unpredictability of the event, uncontrollability of the situation, subjectively unreasonable demands on the individual and unresolved internal conflicts of the individual, for example in the form of low self-esteem in certain situations. (Pugnerová and Kvintová, 2016)

* 1. Types of stress

Seaward (2006) describes that Lazarus, a renowned scientist dealing with stress research, in 1984 described the existence of so-called daily life hassles, which are daily interactions with negative experiences or inconveniences, such as locking the keys in the car or the daily commute to work in a traffic jam. Price, Price and McKenry (2010) also state that these are relatively minor events that arise during daily routine activities, such as cleaning the household, caring for family members, etc. However, the mentioned authors add that although several unexpected daily inconveniences do not appear as too important events during the given day, very often they can interrupt the comfortable flow of the day and can ultimately be responsible for inducing stress. In addition to daily inconveniences, Trenoweth and Moone (2017) mention that there are also so-called daily uplifts. These are events that involve positive experiences, alleviate daily discomforts, and help cope with occasional adversity. (Trenoweth and Moone, 2017) According to the mentioned authors, this is, for example, a good night's sleep, successfully managing a daily challenge, learning good news or perhaps a walk in nature.

According to Zacharová (2017), it is possible to distinguish four types of stress, namely eustress, distress, hypostress and hyperstress. Eustress can be defined as a positive load that stimulates individuals to perform better (Zacharová, 2017), while it usually arises in situations that bring joy, such as winning the lottery (Pugnerová and Kvintová, 2016), which can contribute to the fulfillment of needs and bring beneficial effects. (Plamínek, 2020) On the contrary, according to Pugnerová and Kvintová (2016), distress is negatively experienced stress, which can also be called a state of distress and which has harmful effects, while Zacharová (2017) states that it can not only cause illness, but in the long term can lead to death.

* 1. Stress management

In connection with stress management, it should be mentioned that if a person encounters a stressor, he tries to adapt to it in order to restore the balance of his organism. (Pugnerová and Kvintová, 2016) In connection with this, we can mention coping, which means managing and dealing with a challenging situation. (Švamberk and Šauerová, 2016) Zacharová (2017) explains that in some problematic situations in life, the organism is not activated for an optimal adaptive response that relieves stress, but so-called defense mechanisms are activated, which prevent the given individual from adapting to the situation, which is called maladaptive behavior or poor adjustment. Paulík (2017) states that Sigmund Freud described a total of 10 defense mechanisms and his daughter Anna described even more, however Pugnerová and Kvintová (2016) state that more than 40 defense mechanisms are currently described. Table 1 shows examples of selected mechanisms.

**Table 1: Examples of defense mechanisms**

|  |  |  |
| --- | --- | --- |
| **Mechanism** | **Origin in** | **Brief description** |
| Projection | Aggression | Projecting one's intentions, thoughts onto others. Criticizing them for the same behavior. |
| Aggression | Aggression | Reaction in the form of an attack on an obstacle. Not only physical, but also verbal (slander, swearing, irony). |
| Identification | Aggression | Overshadowing with a strong person, an authority figure who achieved the goal, eg parents. |
| Compensation | Aggression | Replacing failure with success in something else. |
| Rationalization | Aggression | Justifying one's own failure, diverting attention to an illusory rational explanation. |
| Punishing yourself | Aggression | Denying oneself something that is pleasurable to the individual. Self harming. |
| Regression | Escape | A step back to a lower developmental level, i.e. a reaction disproportionate to age or status (crying, sulking). |
| Displacement | Escape | The thought is subconsciously pushed out of consciousness by internal self-censorship. Complexes may occur. |
| Escape to disease | Escape | The transfer of psychological tension to the somatic area, the so-called somatization. E.g. gastric ulcers. |
| Denial | Escape | The reality is too unpleasant and the individual denies it (closes his eyes to the problem). |
| Escape to fantasy | Escape | Processing the problem in fantasy and inducing pleasant feelings, however, does not solve the situation. Use of addictive substances. |
| Sublimation | Escape | Reduction of stress by alternative activities, e.g. collective combat sports. |
| Stereotyping | Escape | Repeated wrong behavior, e.g. repeated inappropriate choice of partner. |

Source: Pugnerová and Kvintová (2016), Kelnarová and Matějková (2014), Švamberk Šauerová (2016); own processing

The table inserted above provides an overview of selected defense mechanisms and their brief description. The given mechanisms are divided according to whether they have their origin from an evolutionary point of view in aggression or escape. However, it should be mentioned that this is not an exhaustive overview, because, for example, Paulík (2016) adds trivialization, or reducing the importance of something that cannot be obtained.

It should be added that within the framework of stress management, there are a number of methods that can be used to actively address stress and eliminate maladaptive behavior. Coates, Ayers and de Visser (2015) describe that there are six main approaches to stress management which are relaxation, physical fitness, cognitive behavioral stress management, meditation, assertiveness training and stress vaccination.

1. Materials and methods

The main goal of this study is to find out how a student's personality type affects the level of stress experienced during university studies. A secondary goal is to find out what specifically causes stress in the university students in relation to their studies. The study thus focuses not only on determining the influence of selected personality traits on the stress experienced during university studies, but also on identifying specific stressors that affect students, which opens up possibilities of how to limit or reduce stress during studies.

The research can be divided into two main phases, namely the phase of determining the personality type of the target group and the phase of determining the level of stress experienced by selected university students. In the first phase, a questionnaire survey is carried out using the MBTI typology in order to characterize and select suitable respondents according to the selected personality typology. The second phase then uses an individual interview with respondents selected according to personality typology to determine the level of stress experienced during university studies. The research methodology therefore combines quantitative research and qualitative research.

* 1. Selection of respondents according to MBTI typology

The target group, and thus the core group, are full-time bachelor students of the University of Finance and Administration. Only students of the bachelor's program are deliberately selected because, compared to master's students, university studies are usually first experience for them and in most cases they do not have any experience of studying at a university. For the above reason, attention is focused only on full-time students, who are usually of the same age category. The size of the sample is set at 80 respondents, who are presented with the MBTI personality typology questionnaire, while the students of the field of marketing communication and the field of security - legal studies were approached.

Data collection in the pre-research took place using the standardized psychological questionnaire MBTI personality typology. The formulation of the questionnaire questions is therefore precisely given, including the administration and subsequent evaluation of the answers. The questionnaire consists of 56 questions, in which the respondents always assess a pair of statements, for which they decide with the help of a 5-point scale which of them they agree with more.

When selecting respondents, it was decided to consider the dimension of focus on the environment (i.e. introversion - extroversion) and the dimension of information processing (thinking - feeling) as selection criteria. The reason for choosing the dimension of introversion - extroversion is primarily the fact that the predominance of introversion leads to the fact that a person prioritizes his individual experiences and states over those around him. Based on this, it can be concluded that introverts focus more on their inner world and feelings, while extroverts focus on their surroundings and other people. (Cakirpaloglu, 2012) Extroverts, on the other hand, like changes, have a predisposition to be impulsive. (Meira et al, 2017) and one of the distinctive characteristics of extroverts is sociability. (Sristava, Angelo and Vallereux, 2008) In addition, introversion and extroversion also have an effect on the formation of student communities in the first years of university studies, as extroverts are ready to find or create a community faster than introverts. (Smith and Lovgren, 2018) Bughi et al. (2017) reported that medical students with predominant extroversion according to the MBTI typology reported greater positive well-being and lower levels of depression compared to introverted students. This is also confirmed by DeMeo et al. (2023) that there are reasons to believe that introversion may be related to different patterns of experiencing so-called daily hassles and uplifts. The reason for choosing the second dimension of thinking – feeling is the fact that personality types with a predominant dimension of thinking (T) show a positive correlation with personality resilience. (Ahangar, 2010) Another starting point is that personality types with a predominant thinking dimension (T) have a significant relationship with experiencing stress. (Das and Sharma, 2015)

The results achieved for all four dimensions were entered for each respondent in a summary table in MS Excel, so that it was possible to select the most suitable respondents according to personality type. The purpose of this phase of the investigation was to select suitable respondents for the next phase, precisely on the basis of the MBTI typology. The selection criteria of individual respondents were determined in such a way that respondents with the most significant values within the monitored dimensions were selected, while the following were selected:

• 10 introverts (I),

• 10 extraverts (E),

• 10 respondents with predominant thinking (T),

• 10 respondents with predominant feeling (F).

Although it is stated above that 10 respondents were approached from each type, a total of 20 respondents were approached in the main phase of the investigation. This is because, for example, in a respondent with predominant introversion, thinking (T) or feeling (F) also prevails. However, it is important that the predominance of individual dimensions is more pronounced, at least 60 %. The characteristics of the selected respondents for the main phase of the survey are shown in table 2 inserted below.

**Table 2: Characteristics of the respondents selected for the interview**

|  |  |  |
| --- | --- | --- |
|  | **Introversion – extraversion** | **Thinking – feeling** |
|  | I | E | T | F |
| **Average** | 75 % | 67 % | 70 % | 69 % |
| **Median** | 73 % | 66 % | 66 % | 66 % |
| **S. D.** | 7 % | 4 % | 12 % | 12 % |

Source: own processing.

The table shows the descriptive statistics of the representation of the monitored dimensions of the MBTI typology in 20 selected respondents who were selected for the main phase of the investigation using a semi-structured interview. The results show that introverts in the selected sample of respondents achieve an average of 75 % introversion rate, extroverts 67 %, while the results are more balanced for these respondents, which is indicated by a relatively low value of the standard deviation (4 %). The same is true for the second monitored dimension.

* 1. Individual interview with selected respondents

The main phase of the research is conceived as a qualitative investigation, in which an individual semi-structured interview with respondents is used as a research method. The 20 respondents approached come from the previous phase of the survey, where suitable respondents were selected using the MBTI personality typology, see Table 2.

The purpose of the interview is to find out whether and to what extent the respondents experience stress as a result of university studies. At the same time, it finds out what specific stressors affect students during their studies. The structure of the interview was designed so that the respondent was able to answer the individual questions and the interview did not cause significant difficulties, but at the same time the objectives of the research were fulfilled. At the same time, the appropriate length of the interview was also considered, so that it did not last too long, which could gradually discourage the respondent from answering. When designing the questions, a psychological approach was used and direct and indirect wording of the questions were used, a 5-point rating scale was used to determine the stressogenicity of experienced stressors, and a 7-point Likert scale. Furthermore, it was investigated whether the respondents used an addictive substance as a result of the stress of their studies. Data collection took place from 3/4/2023 to 6/4/2023 (the period when exams are not yet taking place) in the form of individual interviews, which were recorded on the dictaphone of the iPhone 11 Pro mobile phone.

* 1. Results

During data processing, the answers of all 20 respondents were subjected to the so-called data coding process (Gavora, 2011) in order to categorize the answers and express their frequency. The data were entered into a summary data matrix in MS Excel. When asked in which context the respondents most often experienced stress recently, it was found that school is the most common stressor for the respondents.

**Table 3: The most frequent stressors recently**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | **Collective** | **Work** | **Privacy** | **University** |
| **Introvert** | 20 % | 20 % | 0 % | 60 % |
| **Extrovert** | 0 % | 20 % | 20 % | 60 % |
| **Thinking** | 20 % | 20 % | 20 % | 40 % |
| **Feeling** | 0 % | 20 % | 20 % | 60 % |
| **Total** | 10 % | 20 % | 15 % | 55 % |

Source: own processing.

The data shows that the most experienced stress of respondents arises in connection with university studies, which was stated by 55% of respondents in total. As for more specific causes and reasons for stress, the "school" category includes answers such as a bachelor's thesis, exams in January or exams before Christmas. When asked if the respondent had ever experienced stress during their university studies, 100 % of respondents answered yes. Furthermore, the respondents had the task of listing the stressors that stress them during their studies, and at the same time they had to rate these stressors using a 5-point scale. The more points they give to the stressor, the more the stressor negatively affects them. It is therefore a rating scale that was evaluated using the average of the obtained values.

**Table 4: Evaluation of the intensity of experienced stressors**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  | **Exams** | **Demands** | **Teachers** | **Terms** | **Presentations** | **Avg** |
| **Introvert** | 5,0 | 2,0 | 2,0 | 2,5 | 3,5 | 3,1 |
| **Extrovert** | 4,0 | 2,5 | 3,3 | - | 4,5 | 2,6 |
| **Thinking** | 4,0 | 2,0 | 2,5 | - | 5,0 | 2,4 |
| **Feeling** | 4,6 | 4,0 | 2,0 | 3,3 | 3,7 | 3,4 |
| **Total** | 4,4 | 2,6 | 2,5 | 1,5 | 4,2 | 2,9 |

Source: own processing.

The results show that introverts feel a higher intensity of stress during studies (3,1) than extroverts (2,6), while introverts are most stressed by exams (5,0) and presentations (3,5), which is to be expected for introverts that they are not comfortable with public appearances. Surprisingly, however, public speaking is more stressful for extroverts than for introverts, which the given respondents explained by the fear of losing their position in the collective. Differences are also visible in the second dimension, when types with predominant feeling feel stress more intensely (3,4) than types with predominant thinking (2,4), which may be due to their higher emotionality. It was also somewhat surprising to find that deadlines are a completely marginal stressor for students, stressing them at the lowest intensity compared to other factors. This can be influenced to a certain extent by the fact that the teaching takes place within individual semesters and the submission of assignments, the work can be planned to a certain extent. The next set of questions focused on whether the respondent would consider going to university again, and whether or not he would feel stressed during further studies.

**Table 5: Potential experience of stress during further university studies**

|  |  |  |
| --- | --- | --- |
|  | **Yes** | **No** |
| **Introvert** | 75 % | 25 % |
| **Extrovert** | 40 % | 60 % |
| **Thinking** | 75 % | 25 % |
| **Feeling** | 60 % | 40 % |
| **Total** | 61 % | 39 % |

Source: own processing.

More than half of the respondents, specifically 61 %, said that even if the respondents knew what to expect and knew all the information, they would experience stress when they next start a new higher education institution. This may indicate that for some respondents, studying is more often or significantly associated with stress. However, it can be argued that to a certain extent it is a natural phenomenon when a person experiences a certain amount of stress when entering a new environment, and it can even have a stimulating effect. However, when looking at the results according to personality typology, it is evident that introverts would significantly more often experience stress (75 % of respondents) than extroverts (40 % of respondents) upon re-entering a new university. When evaluating the results of the second dimension of personality, it is evident that more respondents with a predominant dimension of "thinking" (75 %) would have concerns about starting a new study, which can be to some extent due to the fact that they focus more on facts and all obligations, demands, which would accompany such a step. This is evidenced by the response of respondent 11 (a thinking type and an introvert), who stated that "starting at a new university would mean a lot of responsibilities that would have to be managed". An important aspect in the overall concept of the study is the development of the level of perceived stress. It can indicate the ability to adapt to conditions.

**Table 6: Development of stress from university studies over time**

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Increases** | **Does not change** | **Decreases** |
| **Introvert** | 20 % | 20 % | 60 % |
| **Extrovert** | 20 % | 60 % | 20 % |
| **Thinking** | 0 % | 20 % | 80 % |
| **Feeling** | 40 % | 20 % | 40 % |
| **Total** | 20 % | 30 % | 50 % |

Source: own processing.

The most represented area was that respondents' stress decreases over the years, with a total of 50 % of respondents. This may be due to the fact that the respondents know what to expect from the given year of study and also know some teachers from previous semesters. Thus, to a certain extent, half of the respondents experience a gradual restoration of the balance of the organism and a decrease in perceived stress during studies, while this is the fastest for students with a predominant dimension of thinking - up to 80 % of these respondents said that they feel a decreasing level of stress. When asked whether the respondents were thinking about ending their university studies due to stress, only 1 introverted respondent with a predominance of feeling (F) answered positively. It can therefore be concluded that, from a long-term perspective, the stress load as a result of studying was acceptable to the students to the extent that they were willing to continue their studies.

Respondents were also confronted with specific situations in connection with their studies. For this purpose, a 7-point Likert scale was used, with which they evaluated 5 statements. The more points the respondent gave to a given statement, the more he agreed with it. These were the claims:

• Statement A: the attitude of some teachers causes me stress.

• Statement B: I am most often stressed by deadlines for handing in assignments.

• Statement C: half of the subjects in the semester can be completed without stress or with minimal stress.

• Statement D: the stress during my studies also increases the expectations of my parents or partner.

• Statement E: the fear of failing an exam is the most common stressor during my studies.

Table 7 shows the average values of the respondents' numerical answers.

**Table 7: Likert scale evaluation**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | **A** | **B** | **C** | **D** | **E** |
| **Introvert** | 4,8 | 3,8 | 3,8 | 2,8 | 5,5 |
| **Extrovert** | 5,2 | 2,6 | 4,8 | 5,0 | 5,0 |
| **Thinking** | 6,0 | 2,0 | 5,7 | 4,3 | 4,3 |
| **Feeling** | 4,5 | 3,7 | 3,7 | 3,8 | 5,3 |
| **Total** | 5,1 | 3,0 | 4,5 | 4,0 | 5,0 |

Source: own processing.

It follows from the overall data that the respondents expressed the greatest degree of agreement with the first statement that the approach of some educators causes stress in them. This can be seen as logical to some extent, as each teacher may have his own individual approach to teaching, subject completion requirements and students. Statement E, that the fear of failing the exam is the most common stressor, was rated with almost the same degree of agreement, which is consistent with the results in Table 4. The results in Table 4 are also consistent with statement B, which received the least degree of agreement, confirming the fact that deadlines are not the most frequent stressor in the course of university studies in the case of the interviewed respondents. For extroverts, the most significant stressor is the expectations of their parents or partner, which may be due to their orientation to the external environment. On the contrary, for introverts, the most significant stressor is the fear of failure in the exam, which can to some extent be due to the fact that, according to Nakonečný (1997), introverts are more motivated by punishment, or by trying to avoid punishment as much as possible. Furthermore, it was investigated whether the students had ever taken, for example, a supporting drug or an addictive drug, such as alcohol, due to the stress of studying. To a certain extent, this determines whether the respondents needed to ventilate their stress in a certain way or to support and stimulate themselves in coping with it.

**Table 8: Use of an addictive substance due to stress from university studies**

|  |  |  |
| --- | --- | --- |
|  | **Yes** | **No** |
| **Introvert** | 0 % | 100 % |
| **Extrovert** | 40 % | 60 % |
| **Thinking** | 0 % | 100 % |
| **Feeling** | 40 % | 60 % |
| **Total** | 22 % | 78 % |

Source: own processing.

The results show that the vast majority of respondents (78%) never needed to take any supporting medicine or substance. But 40 % of extroverts had used a supportive substance, as had 40 % of feeling-dominant respondents. These are respondents who are open to new experiences, and at the same time emotionally based respondents, on whom stress can have greater effects. Specifically, these respondents used drugs to support attention and memorization during learning. It was also about smoking marijuana as a form of relief from a stressful situation. However, this is a prohibited substance that is considered a light drug, and experimenting with it can be dangerous not only for the respondents' health.

1. Discussion

Based on the conducted research, certain differences in the experience of stress according to personality type were found, as introverted students experience stress more intensely than extroverted students. The stated finding follows the results of Venkatesan et al. (2016), who states that the stress of management students is significantly influenced by introversion-extroversion as well as the thinking-feeling dimension. This is also confirmed by the results of the conducted survey, where types with a predominance of the feeling dimension felt stress more significantly. These result trends are followed by the results of the study by Bughi et al. (2017), when extroverted types feel greater mental well-being than introverted types. At the same time, it can be stated that, given the results, it would be possible to examine in more detail the frequency of experiencing so-called daily upheavals from the perspective of introversion - extraversion, because introverts experience them less often. (DeMeo, 2023) The results of the self-study also indicate that introverts and extroverts use different coping and relaxation strategies, which follows the results of the study by Das and Sharma (2015). However, the issue could be investigated in more detail and comprehensively in the next survey. Our own research indicates that introverted individuals ventilate stress mainly by going out into nature, while extroverts try to relax most often in the company of people.

1. Conclusion and future work

The main outputs of the work can be summarized by pointing out the differences between introverts and extroverts in experiencing stress among the students addressed. However, for half of the respondents, the experienced stress gradually decreases during their studies, which indicates the adaptation of the students to the given conditions and environment. Nevertheless, 22 % of respondents resorted to the use of supporting substances due to the stress of studying.

The main goal of this study is to find out how a student's personality type affects the level of stress experienced during university studies. The given goal can be considered fulfilled on the basis of the research carried out. A secondary goal of this study is to recognize what specifically causes stress in relation to their studies in the university students addressed. It can be stated that the secondary goal of the work is also fulfilled, which is evidenced by tables 3, 4 and 7, which are devoted not only to determining the effect of individual stressors, but also to their intensity of effect.

Although the results of the study point to relatively interesting result trends that follow the collected research studies, it is appropriate to discuss the limits of the study and the possible direction of further investigation. The survey itself focuses only on full-time bachelor students of the second year of a particular university, which could be extended to other groups of students in a possible follow-up survey. This is mainly a comparison of stressors and their intensity between students of bachelor's and master's programs, as the follow-up study usually places higher demands on students, even though students already have more experience with their studies. At the same time, it would be appropriate to work with a larger sample of respondents, although this study primarily tried to work with respondents individually (and there was no attempt to conduct representative research). However, the results indicate that it is appropriate to continue to address this issue in more detail.

Dedication

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Literature:

1. Adam, Z., Klimeš, J., Pour, L., Král, Z., Onderková, A., Čermák, A. & Vorlíček, J., 2019. *Maligní onemocnění, psychika a stres: příběhy pacientů s komentářem psychologa*. Praha: Grada Publishing. ISBN 978-80-271-2539-5.
2. Ahangar, R. G., 2010. A study of resilience in relation to personality, cognitive styles and decision making style of management students. In: *African journal of business management*, *4*(6), 953-961.
3. Bughi, S. A., Lie, D. A., Zia, S. K., & Rosenthal, J., 2017. Using a personality inventory to identify risk of distress and burnout among early stage medical students. In: *Education for Health*, *30*(1), 26. DOI: 10.4103/1357-6283.210499.
4. Cakirpaloglu, P., 2012. *Úvod do psychologie osobnosti*. Praha: Grada. Psyché (Grada). ISBN 978-80-247-4033-1.
5. Coates, R., de Visser, R., & Ayers, S., 2015. Not identifying with postnatal depression: a qualitative study of women’s postnatal symptoms of distress and need for support. In: *Journal of Psychosomatic Obstetrics & Gynecology*, *36*(3), 114-121. doi.org/10.3109/0167482X.2015.1059418.
6. Das, I., & Sharma, P., 2015. Relation between Myers Briggs psychological types and stress among university students. In: *Indian Journal Of Health & Wellbeing*, *6*(1).
7. DeMeo, N. N., Smyth, J. M., Scott, S. B., Almeida, D. M., Sliwinski, M. J., & Graham‐Engeland, J. E., 2023. Introversion and the frequency and intensity of daily uplifts and hassles. In: *Journal of Personality*, *91*(2), 354-368. doi.org/10.1111/jopy.12731.
8. Gavora, P., 2010. Elektronická učebnica pedagogického výskumu. Online. Bratislava, Univerzita Komenského. ISBN 978–80–223–2951–4. Dostupné na: http://www.e-metodologia.fedu.uniba.sk/. [2024-05-16].
9. Helus, Z., 2018. *Úvod do psychologie* 2., přepracované a doplněné vydání., Praha: Grada. ISBN 978-80-247-4675-3.
10. Jochmannová, L. & Kimplová, T., 2021. *Psychologie zdraví: biologické, psychosociální, digitální a spirituální aspekty*. Praha: Grada. Psyché (Grada). ISBN 978-80-271-2569-2.
11. Kučera, D., 2013. *Moderní psychologie: hlavní obory a témata současné psychologické vědy*. Praha: Grada. Psyché (Grada). ISBN 978-80-247-4621-0.
12. Meira Jr, C. D. M., Moraes, R., Moura, M., Ávila, L. T. G., Tosini, L., & Magalhães, F. H. (2018). Extraversion/introversion and age-related differences in speed-accuracy tradeoff. *Revista Brasileira de Medicina do Esporte*, 24(3), 225-229. doi: 10.1590/1517.
13. Muknšnáblová, M., 2015. *Prevence nemocí: Nejčastější problémy na cestě k obnovení nebo udržení zdraví*. Praha: Muknšnáblová. ISBN 978-80-60-8028-2.
14. Nakonečný, M., 1997. *Psychologie osobnosti* Vyd. 2., Praha: Academia. ISBN 80-200-1289-3.
15. Paulík, K., 2017. *Psychologie lidské odolnosti.* 2., přepracované a doplněné vydání., Praha: Grada. ISBN 978-80-247-5646-2.
16. Plamínek, J., 2008. *Sebepoznání, sebeřízení a stres: praktický atlas sebezvládání.* 2. aktualiz. a dopl. vyd., Praha: Grada. ISBN 978-80-247-2593-2.
17. Plamínek, J., 2020. *Džungle v nás: praktická psychologie pro každého*. Praha: Grada. ISBN 978-80-271-1691-1.
18. Price, S., Price, C. & Mckenry, P., 2010. *Families & Change: Coping With Stressful Events and Transitions*. 4. vyd. London: Sage Publications. ISBN 978-1-4129-6851-5.
19. Pugnerová, M. & Kvintová, J., 2016. *Přehled poruch psychického vývoje*. Praha: Grada. Psyché (Grada). ISBN 978-80-247-5452-9.
20. Seaward, B., 2006. *Managing Stress: Principles and Strategies for Health and Wellbeing*. 5. vyd. Sudbury: Jones and Barlett Publishers. ISBN 0-7637-3532-9.
21. Smith, K. and R. Lovgren, 2018. Empirický důkaz hlubokého učení ve vzdělávacích komunitách. In: *Journal of Applied Research in Higher Education*. ISSN 2050-7003. 1. června 2018. DOI: 10.1108/JARHE-11-2017-0141.
22. Srivastava, S., Angelo, K. M., & Vallereux, S. R., 2008. Extraversion and positive affect: A day reconstruction study of person–environment transactions. In: *Journal of Research in Personality*, 42(6), 1613–1618. doi: 10.1016/j.jrp.2008.05.002.
23. Švamberk Šauerová, M., 2018. *Techniky osobnostního rozvoje a duševní hygieny učitele*. Praha: Grada. Pedagogika (Grada). ISBN 978-80-271-0470-3.
24. Trenoweth, S. & Moone, N., 2017. *Psychosocial Assessment in Mental Health*. London: Sage Publications. ISBN 987-1-4739-1284-7.
25. Zacharová, E., 2017. *Zdravotnická psychologie: teorie a praktická cvičení*. 2., aktualizované a doplněné vydání. Praha: Grada Publishing. Sestra (Grada). ISBN 978-80-271-0155-9.

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