SINDROM SAGORIJEVANJA KOD STUDENATA NASTAVNIČKIH STUDIJA U STEM PODRUČJIMA

BURNOUT LEVELS AMONG STUDENT TEACHERS IN STEM FIELDS

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Sažetak: *Cilj je istraživanja ispitati pojavu sindroma sagorijevanja kod studenata nastavničkih studija u STEM područjima na Prirodoslovno-matematičkom fakultetu (PMF) u Splitu. U istraživanju je sudjelovalo 85 studenata različitih nastavničkih studija, od toga 59 žena i 26 muškaraca. Kao instrument istraživanja primjenjivao se upitnik koji je uključivao skalu Maslach Burnout Inventory – Student Survey (MBI-SS) koja kroz 16 čestica ispituje pojavu sindroma sagorijevanja kod studenata. Visoka razina sagorijevanja s obzirom na podskalu Emocionalna iscrpljenost zabilježena je kod 25% ispitanika, za podskalu Cinizam kod 19% ispitanika, a za podskalu Akademska samoefikasnost kod njih 27%. Statistička analiza pokazala je da nema značajnih razlika u pojavi sagorijevanja s obzirom na spol i vrstu studija, dok je za određene čestice postojala statistički značajna razlika s obzirom na upisanu godinu studija. Statistički značajne razlike utvrđene su za podskalu Akademska samoefikasnost između studija Biologija i kemija i Informatika te Biologija i kemija i Informatika i tehnika. Istraživanjem je utvrđeno da studenti nastavničkih studija na PMF-u u Splitu imaju umjerenu razinu sagorijevanja što može ukazati na potrebu za uvođenjem preventivnih programa sa svrhom poboljšanja psihološke dobrobiti ovih studenata, kako bi se kvalitetnije pripremili za buduće nastavničko zanimanje.*

Ključne riječi: *nastavnički studij, Maslach, sagorijevanje, STEM, studenti*

Abstract: *The aim of the study was to investigate the occurrence of burnout syndrome in student teachers in STEM subjects at the Faculty of Science in Split. The study sample consisted of 85 students from different teacher education programmes, of which 59 were female and 26 male. The research instrument used was a questionnaire containing the Maslach Burnout Inventory - Student Survey (MBI-SS) scale, which uses 16 items to examine the occurrence of burnout syndrome in students. A high level of burnout was observed in 25% of the respondents on the Emotional Exhaustion subscale, as well as in 19% of the respondents on the Cynicism subscale and in 27% of the respondents on the Academic Self-Efficacy subscale. Statistical analysis showed that there were no significant differences in the occurrence of burnout in relation to gender and type of study, while for certain items, there was a statistically significant difference in relation to the year of study. Considering the Academic Self-Efficacy subscale, statistically significant differences were observed between the biology-chemistry and computer science, as well as biology-chemistry and computer science-technics degree programmes. The study found that student teachers at the Faculty of Science in Split have a moderate level of burnout, indicating the need to introduce preventive programmes to improve the psychological well-being of these students to better equip them for their future careers in the teaching profession.*

Keywords*: burnout, Maslach, teacher study programmes, STEM, students*

UVOD

Prva istraživanja o sindromu sagorijevanja uglavnom su se vezala za zdravstvene radnike, da bi se naknadno proširila i na ostala zanimanja, pa je često generalizirano da se sindrom sagorijevanja pojavljuje samo na poslu (Chang i sur., 2000; Lei-

INTRODUCTION

Early research on burnout syndrome was mainly related to healthcare workers, and it was later extended to other professions: therefore, it was often concluded that burnout syndrome only occurs in the workplace (Chang et al., 2000; Leiter

ter & Schaufeli, 1996; Shirom, 1989). Na temelju rezultata različitih istraživanja Svjetska zdravstvena organizacija uvrstila je sagorijevanje na poslu u 11. Reviziju međunarodne klasifikacije bolesti kao sindrom koji se razvija kao posljedica kroničnog stresa na radnom mjestu kojim se nije uspješno upravljalo (WHO, 2019). Istraživanja o sindromu sagorijevanja poslije su se proširila i na obrazovanje (Reis i sur., 2015), gdje su bila usmjerena na ispitivanje pojave specifičnih simptoma koji se razvijaju zbog stresa povezanog s učenjem i ostvarivanjem obrazovnih obaveza među studentima u visokom obrazovanju (D'Aurora & Fimian, 1988; Fimian & Cross, 1986; Garden, 1991; Meier & Schmeck, 1985). S obzirom na to da aktivnosti u koje su studenti uključeni kao i karakteristike zadataka koje moraju ispuniti uvelike nalikuju onima iz brojnih zanimanja (pr. redovno pohađanje nastave, polaganje ispita i sl.) (Schaufeli i sur., 2002), sigurno je da se i kod studenata pojavljuju osjećaji iscrpljenosti i smanjene predanosti prema obavezama koje moraju ispuniti (Schaufeli & Taris, 2005). Prijašnja istraživanja pokazala su da su simptomi sagorijevanja uobičajeni kod svih studenata bez obzira na vrstu studija koji pohađaju (Reis i sur., 2015). Tako je, primjerice, sagorijevanje zabilježeno i kod studenata medicine (Boudreau i sur., 2004; Dyrbye i sur., 2006; Galán i sur., 2011; Bogdan Ilić Živojinović i sur., 2019; Worly i sur., 2019; Bolatov i sur., 2022), studenata iz područja tehničkih znanosti (Yang & Farn, 2005), studenata primaljstva (López-Alegría i sur., 2020) studenata arhitekture (Celik & Oral, 2013), i kod studenata različitih studijskih programa za obrazovanje učitelja i odgajatelja (Engin, 2019). Unatoč činjenici da postoje brojna istraživanja o sagorijevanju kod studenata, neke skupine studenata još su uvijek nedovoljno istražene. Tu se ubrajaju i studenti nastavničkih studija u područjima znanosti, tehnologije, inženjerstva i matematike (STEM) kod kojih zbog specifičnih zahtjeva studija postoji velika mogućnost za razvijanje sindroma sagorijevanja. U ovom radu će se stoga ispitati pojava sindroma sagorijevanja kod navedene skupine studenata kako bi se dobio uvid u njihovo emocionalno stanje, opterećenost i učinkovitost na studiju. Uzimajući u obzir vrijeme potrebno za povlačenje

& Schaufeli, 1996; Shirom, 1989). Based on the results of various studies, the World Health Organization has included workplace burnout in the 11th revision of the International Classification of Diseases as a syndrome that develops as a result of chronic stress that has not been successfully managed in the workplace (WHO, 2019). Research on burnout syndrome was later extended to the field of education (Reis et al., 2015), where it aimed to investigate the occurrence of specific symptoms that develop due to stress that is associated with learning and the fulfilment of educational obligations in students in higher education (D'Aurora & Fimian, 1988; Fimian & Cross, 1986; Garden, 1991; Meier & Schmeck, 1985). Considering that the activities that students are involved in and the characteristics of the tasks they have to perform are very similar to those of many professions (e.g., regularly attending classes, taking exams, and so on; Schaufeli et al., 2002), it is certain that feelings of exhaustion and reduced commitment to the duties they have to perform are also seen in students (Schaufeli & Taris, 2005). Previous research has shown that burnout symptoms occur in all students, regardless of the type of study they are undertaking (Reis et al., 2015). Burnout has also been reported in medical students (Boudreau et al., 2004; Dyrbye et al., 2006; Galán et al., 2011; Bogdan Ilić Živojinović et al., 2019; Worly et al., 2019; Bolatov et al., 2022), students from the field of technical sciences (Yang & Farn, 2005), midwifery students (López-Alegría et al., 2020), architecture students (Celik & Oral, 2013), and students of various education study programmes for teachers and educators (Engin, 2019). Despite the fact that there is a lot of research on student burnout, some groups of students are still under-researched. This includes student teachers in Science, Technology, Engineering, and Math fields (STEM), who are highly likely to develop burnout syndrome due to the specific demands of their studies. This paper, therefore, examines the occurrence of burnout syndrome in this group of students in order to gain an insight into their emotional state, workload, and effectiveness during their studies. Considering the time it takes for the symptoms of burnout syndrome to resolve (Taris

simptoma sagorijevanja (Taris i sur., 2005), postoji vjerojatnost da će simptomi opstati i nakon što studenti započnu svoju karijeru kao mladi stručnjaci. Zbog toga je važno istraživati fenomen sagorijevanja kod studenata jer postoje dokazi koji upućuju na to da sagorijevanje na poslu slijedi razvojni proces koji je započeo možda već tijekom studiranja (Dyrbye i sur., 2006).

Sindrom sagorijevanja

Pojam sagorijevanja (engl. *burnout*) u sedamdesetim godinama 20. stoljeća uvodi američki psihijatar Freudenberger (1974), a prepoznaje ga kod ljudi koji su zbog česte izloženosti dugotrajnom stresu izgubili motivaciju i posvećenost prema poslu koji obavljaju (Martinko, 2010). Maslach (1981) definira sagorijevanje kao sindrom emocionalne iscrpljenosti, depersonalizacije i smanjenja osobnih postignuća, koji se najčešće pojavljuje kod osoba koje se bave pomoćnim profesijama, u poslovima vezanim za neposredan rad s ljudima. Brojna istraživanja o pojavi sagorijevanja provedena su upravo među socijalnim radnicima, učiteljima, liječnicima, odvjetnicima i medicinskim sestrama (Backović & Jevtić, 2012; Freudenberger, 1974; Bianchi i sur., 2015). Tijekom godina, empirijska istraživanja pokazala su da se sagorijevanje može pojaviti kod bilo kojeg zaposlenika bez obzira na posao koji obavlja (Leiter & Schaufeli, 1996; Maslach i sur., 2008), u uvjetima kada se suočava s neravnotežom između zahtjeva posla i raspoloživih resursa (Demerouti i sur., 2001; Karasek, 1979).

Prema Maslach i sur. (2001), sindrom sagorijevanja ima trodimenzionalnu strukturu. Kao najvažnija dimenzija često se ističe emocionalna iscrpljenost, koja se odnosi na doživljaje pojedinca da su njegove emotivne snage iscrpljene više nego što može podnijeti (Maslach i sur., 2001). U nekim slučajevima, ova dimenzija izgaranja smatrala se presudnom u određivanju prisutnosti izgaranja (Kristensen i sur., 2005; Shirom & Melamed, 2005). Uz iscrpljenost je usko vezana i depersonalizacija koja se odnosi na razvoj ciničnog odnosa prema radu i gubitak osjećaja vlastitog identiteta. Ove dvije dimenzije smatraju se glavnim elementima za procjenu pojave sagorijevanja (Green i sur., 1991). Kao treća dimenzija sagorije-

et al., 2005), it is likely that the symptoms persist even after the students enter the workplace as young professionals. For this reason, it is important to study the phenomenon of burnout in students, since there is evidence that burnout in the workplace follows a developmental process that may have already begun during their studies (Dyrbye et al., 2006).

Burnout syndrome

The term ‘burnout’ was introduced in the 1970s by the American psychiatrist, Freudenberger (1974), who recognised the syndrome in individuals who had lost their motivation and commitment to work due to frequent and constant stress (Martinko, 2010). Maslach (1981) defined burnout as a syndrome of emotional exhaustion, depersonalisation, and diminished personal accomplishment that occurs most frequently in individuals who work in support professions, i.e., occupations that involve working directly with other individuals. Numerous studies have been conducted on the occurrence of burnout in social workers, teachers, doctors, lawyers, and nurses (Backović & Jevtić, 2012; Freudenberger, 1974; Bianchi et al., 2015). Over the years, empirical research has shown that burnout can occur in any employee, regardless of the job they perform (Leiter & Schaufeli, 1996; Maslach et al., 2008), especially when there is an imbalance between job demands and available resources (Demerouti et al., 2001; Karasek, 1979).

According to Maslach et al. (2001), burnout syndrome has a three-dimensional structure. The most important dimension often emphasised is emotional exhaustion, which refers to a person’s experience of being more emotionally exhausted than they can bear (Maslach et al., 2001). In some cases, this dimension of burnout has been considered crucial to the presence of burnout (Kristensen et al., 2005; Shirom & Melamed, 2005). Closely related to exhaustion is depersonalisation, which refers to the development of a cynical attitude towards work and the loss of a sense of personal identity. These two dimensions are considered to be the most important elements in assessing the occurrence of burnout (Green et al., 1991). The

vanja, naknadno je uključena smanjena efikasnost koja se opisuje kao negativna samoprocjena kompetencija i postignuća na radnom mjestu, a razvija se neovisno o iscrpljenosti i depersonalizaciji (Maslach i sur., 2001).

Akademsko sagorijevanje studenata

Iako studenti formalno nisu radnici, sa psihološkog stajališta većina studentskih aktivnosti vezanih za studij usporediva je s formalnim poslom. Studenti imaju određene uloge i obavljaju aktivnosti koje zahtijevaju napor, kao i obični radnici. Moraju pohađati redovitu nastavu i izvršavati određene zadatke pod kontrolom svojih nadređenih, a njihova izvedba redovito se ocjenjuje (Esteve, 2003). U skladu s izvornom definicijom sagorijevanja, Schaufeli i sur. (2002) definiraju sagorijevanje studenata kao trodimenzionalni sindrom koji karakteriziraju osjećaji iscrpljenosti zbog zahtjeva učenja, ciničan stav i ravnodušnost prema obavezama te smanjena učinkovitost u pogledu akademskih zahtjeva. Sukladno definiciji, iscrpljenost se definira kao osjećaj naprezanja i kroničnog umora koji je posljedica preopterećenosti poslom. Cinizam se očituje u ravnodušnom odnosu prema studiju, gubitku interesa za studij i neshvaćanju njegovog smisla. Smanjena profesionalna učinkovitost odnosi se na smanjeni osjećaj kompetentnosti, kao i na manje uspješna postignuća ili nedostatak postignuća na studiju.

Studentsko sagorijevanje povezano je s nekoliko negativnih procesa. Visoke razine sagorijevanja vežu se za smanjeni angažman na studiju (Ciliers i sur., 2017; Fiorilli i sur., 2017; Shih, 2015) i promjenama u motivaciji. Dokazano je i da studenti koji pate od sindroma sagorijevanja imaju sklonost razvijanju strategija izbjegavanja cilja umjesto orijentacije na savladavanje cilja (Jagodics i sur., 2021; Chang i sur., 2016; Tuominen-Soini i sur., 2012), postižu lošiji akademski uspjeh (Herrmann i sur., 2019; Seibert i sur., 2016) i skloniji su izostancima (Seibert i sur., 2016).

S obzirom na visoku zastupljenost problema mentalnog zdravlja kod studenata, istraživanje studentskog sagorijevanja iznimno je važno jer izravno procjenjuje njihovu psihološku dobrobit

third dimension of burnout is included as reduced performance, which is described as a negative self-assessment of competence and performance at work, which develops independently of exhaustion and depersonalisation (Maslach et al., 2001).

Academic burnout among students

Although students are not formally considered as employees, from a psychological point of view, most student activities related to their studies can be compared to formal work. Students have certain roles and perform activities that require effort, similar to normal employees. They must regularly attend classes and perform certain tasks under the supervision of their supervisors, and their performance is regularly evaluated (Esteve, 2003). Consistent with the original definition of burnout, Schaufeli et al. (2002) defined student burnout as a three-dimensional syndrome characterised by feelings of exhaustion due to the demands of learning, a cynical attitude and indifference to obligations, and diminished effectiveness in relation to academic demands. According to their definition, exhaustion is defined as a feeling of tension and chronic fatigue resulting from overwork. Cynicism manifests itself in an indifferent attitude towards studying, a loss of interest in studying, and a misunderstanding of its importance. Reduced professional effectiveness refers to a reduced sense of competence and less successful or absent academic performance.

Student burnout is associated with several negative processes. High levels of burnout have been associated with decreased student engagement (Ciliers et al., 2017; Fiorilli et al., 2017; Shih, 2015) and altered motivation. It has also been shown that students suffering from burnout syndrome tend to develop goal avoidance, instead of a goal accomplishment strategies (Jagodics et al., 2021; Chang et al., 2016; Tuominen-Soini et al., 2012), achieve poorer academic success (Herrmann et al., 2019; Seibert et al., 2016), and are more prone to absenteeism (Seibert et al., 2016).

Given the high prevalence of mental health problems among students, research on student burnout is extremely important as it directly as-

u odnosu na uložene akademske napore (Wickramasinghe i sur., 2018). Treba uzeti u obzir da sagorijevanje ne ovisi samo o pojedinačnim osobnim čimbenicima poput emocionalnog izražavanja ili neprikladnih strategija suočavanja sa stresom (de la Fuente i sur., 2020), već je povezano i s vanjskim čimbenicima poput obrazovnog sustava (Durán i sur., 2006). Zbog toga se tijekom obrazovnog procesa trebaju stvarati uvjeti u kojima će se studenti osjećati željnima učenja i spremnima na smisleno ispunjavanje obaveza kako bi se uspješno nosili sa svim akademskim izazovima. Iz tog razloga važno je kontinuirano pružanje podrške studentima kako bi im se pomoglo smanjiti razinu sagorijevanja i izbjeći situacije koje im izazivaju dodatan stres (Çam i sur., 2014).

Stoga je cilj ovog istraživanja rasvijetliti razmjere sagorijevanja među budućim STEM nastavnicima i ispitati postoje li razlike u razinama sagorijevanja s obzirom na spol, vrstu studija i godinu studija. Rezultati istraživanja mogu potencijalno doprinijeti razvoju prilagođenih obrazovnih programa usmjerenih na poučavanje studenata koji se obrazuju za posao nastavnika učinkovitim strategijama suočavanja i tehnikama izgradnje otpornosti. Istraživanjem će se također istaknuti potreba za daljnjim istraživanjima sustavnih pitanja u obrazovanju nastavnika STEM-a koja doprinose sagorijevanju i potaknuti šira rasprava o dizajnu kurikuluma i radnom opterećenju studenata tijekom studija.

METODOLOGIJA

Hipoteze

U skladu s ciljem istraživanja formulirane su sljedeće hipoteze:

H1: Studenti nastavničkih usmjerenja u STEM područjima na PMF-u u Splitu doživljaju sindrom sagorijevanja.

H2: Ne postoji statistički značajna razlika u emocionalnoj iscrpljenosti, cinizmu i akademskoj samoefikasnosti s obzirom na spol.

H3: Ne postoji statistički značajna razlika u emocionalnoj iscrpljenosti, cinizmu i akademskoj samoefikasnosti s obzirom na vrstu studija.

sesses their mental well-being in relation to their academic endeavours (Wickramasinghe et al., 2018). It should be considered that burnout is not only dependent on individual personal factors such as emotional expression or inappropriate stress-related coping strategies (de la Fuente et al., 2020), but is also related to external factors such as the educational system (Durán et al., 2006). Therefore, during the educational process, conditions should be created in which students feel eager to learn and willing to fulfil their obligations in a meaningful way in order to successfully master all academic challenges. For this reason, it is important to provide continuous support to students to help them reduce their burnout levels and avoid situations that cause them additional stress (Çam et al., 2014).

Therefore, the aim of this study was to shed light on the extent of burnout among future STEM teachers and to investigate whether there are differences in burnout levels based on gender, type of study programme, and year of study. The results of this study can potentially contribute to the development of tailored educational programmes aimed at equipping student teachers with effective coping strategies and resilience-building techniques. The study will also highlight the need for further research on systemic issues in STEM teacher education that contribute to burnout and stimulate a broader discussion on curriculum design and student workload during their studies.

METHODS

Research hypotheses

In accordance with the research objective, the following research hypotheses were formulated:

H1: Student teachers in STEM fields at the Faculty of Science in Split experience burnout syndrome.

H2: There is no statistically significant difference in terms of emotional exhaustion, cynicism, and academic self-efficacy in relation to gender.

H3: There is no statistically significant difference in emotional exhaustion, cynicism, and academic self-efficacy in relation to type of study.

H4: Ne postoji statistički značajna razlika u emocionalnoj iscrpljenosti, cinizmu i akademskoj samoefikasnosti s obzirom na godinu studija.

Sudionici

Svi studenti prve i druge godine diplomskih studija različitih nastavničkih studija na Prirodoslovno-matematičkom fakultetu u Splitu bili su pozvani na sudjelovanje u istraživanju. Prikupljen je neslučajan ciljni uzorak koji su činili studenti upisani u STEM obrazovne programe. Odabir se temeljio na dostupnosti i spremnosti studenata za sudjelovanje, čime je osigurana raznolikost iskustava relevantnih za ciljeve istraživanja. U istraživanju je sudjelovalo ukupno 85 studenata koji se obrazuju za zanimanje nastavnika STEM predmeta. S obzirom na spolnu zastupljenost, sudjelovalo je 59 žena i 26 muškaraca. Upitnik je ispunilo 59 % studenata prve godine diplomskog studija i 41% studenata druge godine diplomskog studija. Najzastupljeniji su odgovori studenata diplomskih studija informatike (36.5%), biologije i kemije (30.6 %) i informatike i tehnike (20 %). Mnogo manje zastupljeni su studenti fizike (4.7%), matematike i fizike (3.5%) i matematike i informatike (2.4%), a najmanje studenti fizike i informatike (1.2%) i matematike (1.2%).

Instrument istraživanja

Za potrebe istraživanja pripremljen je anketni upitnik koji se sastoji od dvaju dijelova. Prvi dio upitnika sadrži tri čestice koje ispituju spol, vrstu upisanog diplomskog studija i godinu studija. Drugi dio upitnika čini skala *Maslach Burnout Inventory – Student Survey* (Maslach & Jackson, 1981) prilagođena prema Schaufeli i sur. (2002a) i Ukić (2017). Skala se sastoji od 16 čestica, odnosno tri subskale, od kojih je pet čestica usmjereno na ispitivanje emocionalne iscrpljenosti (EI) (pr. *Na kraju dana se osjećam potrošeno*), pet čestica koje se odnose na cinizam (CI) (pr. *Sve sam ciničniji oko toga doprinosi li moj studij ičemu*) i šest čestica koje ispituju akademsku samoefikasnost (AS)(pr. *Mogu učinkovito rješavati probleme koji se pojavljuju tijekom studija*). Ispitanici su na Likertovoj ljestvici od sedam stupnjeva izra-

H4: There is no statistically significant difference in emotional exhaustion, cynicism, and academic self-efficacy in relation to year of study.

Participants

All first- and second-year students in various graduate programmes at the Faculty of Science in Split were invited to participate in the survey. A non-probability purposive sampling method was employed, focusing on student teachers enrolled in STEM education programmes. The selection focused on the students' availability and willingness to participate, ensuring a diverse range of experiences relevant to the study's objectives. The final sample consisted of 85 students preparing to become teachers of STEM subjects. In terms of gender representation, 59 of the respondents were women and 26 were men. Among the respondents who completed the questionnaire, 59% were first-year students and 41% were second-year graduate students. A larger proportion of the respondents included students of computer science (36.5%), biology and chemistry (30.6%), and computer science and technics (20%). Students of physics (4.7 %), mathematics and physics (3.5 %), and mathematics and computer science (2.4 %) were significantly less represented, and students of physics and computer science (1.2 %) and mathematics (1.2 %) were the least represented.

Research instrument

A questionnaire consisting of two parts was created for the purpose of the present study. The first part of the questionnaire consisted of three items related to gender, the type of study enrolled in, and the year of study. The second part of the questionnaire consisted of the *Maslach Burnout Inventory - Student Survey scale* (Maslach & Jackson, 1981), which was adapted by Schaufeli et al. (2002) and Ukić (2017). The scale consists of 16 items, i.e., 3 subscales, of which 5 items aimed to understand emotional exhaustion (EE) (e.g., 'At the end of the day, I feel exhausted'), 5 items related to cynicism (CY) (e.g., 'I am increasingly cynical about whether my studies are contributing to anything'), as well as 6 items examining academ-

žavali učestalost slaganja s pojedinom tvrdnjom u rasponu od 0 (nikad) do 6 (svaki dan). Visoki rezultati na podskalama emocionalne iscrpljenosti i cinizma te niski rezultati na podskali akademske samoefikasnosti tumače se kao pokazatelji prisutnosti sindroma izgaranja kod ispitanika (Maslach i sur., 1996). Rezultati podskala smatraju se visokim ako se nalaze u gornjoj trećini distribucije odgovora, prosječnim ako se nalaze u srednjoj trećini i niskim ako su u donjoj trećini distribucije (Maslach i sur., 1996, Schaufeli i sur., 1996). Tako su definirani pragovi za razinu sagorijevanja, koji su prikazani u Tablici 1. Ukupna pouzdanost skale (Cronbach Alpha, N=85) je zadovoljavajuća (α=.738), kao i svake od triju podskala (α (EI) = .884; α (CI)=.793; α (AS)= .794).

Prikupljanje i analiza podataka

Istraživanje je provedeno tijekom svibnja i lipnja 2023. godine na Prirodoslovno-matematičkom fakultetu u Splitu. Ispitanici su dobili informaciju da se istraživanje provodi u svrhu prikupljanja podataka o pojavi sindroma sagorijevanja kod studenata nastavničkih usmjerenja i zamoljeni su za suradnju. Prije početka prikupljanja podataka istraživanje je odobrilo Etičko povjerenstvo Prirodoslovno-matematičkog fakulteta u Splitu. Sudjelovanje je bilo dobrovoljno, a svi prikupljeni odgovori u potpunosti anonimni. Sudionicima je u prosjeku trebalo 10 minuta za ispunjavanje upitnika. Upitnici su u papirnatom obliku podijeljeni studentima za vrijeme redovne nastave, u dva kruga. Ovako su prikupljena 62 odgovora. Kako bi se pokušao dobiti što veći broj odgovora, upitnik je pripremljen i u digitalnom obliku pomoću Google obrazaca i putem e-maila, proslijeđen svim studentima iz ciljanog uzorka sa zamolbom da ga ispune svi oni koji dotad nisu. Tako su prikupljena još 23 odgovora. Svi prikupljeni podaci objedinjeni su u Excel tablici i obrađeni u programskom paketu SPSS (*Statistical Package for Social Science*; SPSS 23, IBM). Statistička analiza uključivala je svih 85 studenata koji su sudjelovali u istraživanju i nije bilo podataka koji nedostaju. Primjenjivale su se mjere deskriptivne statistike, uključujući frekvencije i postotak i mjere središnje tendencije (srednja vrijednost i

ic self-efficacy (AS) (e.g., 'I can effectively solve problems that arise during my studies'). Respondents were asked to indicate the frequency of their agreement with a particular statement on a 7-point Likert scale ranging from 0 (never) to 6 (every day). High scores on the Emotional Exhaustion and Cynicism subscales and low scores on the Academic Self-Efficacy subscale are interpreted as indicators of the presence of burnout syndrome in the respondents (Maslach et al., 1996). The subscale scores are considered high if they are in the upper third of the response distribution, average if they are in the middle third, and low if they are in the lower third of the distribution (Maslach et al., 1996, Schaufeli et al., 1996). In this way, the cut-off points for burnout levels have been defined, as shown in Table 1. The overall reliability of the scale (Cronbach's alpha, N = 85) is satisfactory (α = 0.738), as is that of each of the three subscales (α(EE) = 0.884, α(CY) = 0.793, α(AS) = 0.794).

Procedure and data analysis

The survey was conducted between May and July 2023 at the Faculty of Science in Split. Respondents were informed that the survey was being conducted with the aim of collecting data on the occurrence of burnout syndrome in student teachers and were asked to cooperate. Prior to data collection, the study was approved by the Ethics Committee of the Faculty of Science in Split. Participation in the study was voluntary and all responses collected were completely anonymous. Participants took an average of 10 minutes to complete the questionnaire. The questionnaires were distributed in paper form to the students in two rounds during regular classes. In this way, 62 responses were collected. In order to obtain as many responses as possible, a digital version of the questionnaire was also prepared using Google Forms and sent by e-mail to all students in the target sample who had not yet responded. In this way, a further 23 responses were collected. All the data collected was summarised in an Excel spreadsheet and processed using SPSS (Statistical Package for Social Science; SPSS 23, IBM). All 85 students who participated in the study were included in the statistical analysis, and there was

medijan). Za testiranje normalnosti distribucije primjenjivao se Kolmogorov-Smirnov test, kojim je utvrđeno da pretpostavka normalne raspodjele varijabli nije ispunjena. Iz tog razloga, u statističkoj analizi upotrebljavali su se neparametrijski testovi, Mann-Whitney U test i Kruskal-Wallis test.

REZULTATI

Deskriptivnom analizom odgovora za čestice u podskali Emocionalna iscrpljenost utvrđeno je da studenti obično pokazuju osjećaj iscrpljenosti na studiju. Među tvrdnjama u podskali ističe se čestica vezana za napor koji izaziva cjelodnevno pohađanje nastave (M= 3,72), koji studenti često doživljavaju. Prema rezultatima iz podskale Cinizam, vidljivo je da se kod studenata ponekad pojavljuje manjak entuzijazma za fakultet i ciničan odnos prema studiju, a ističe se najniža srednja vrijednost za česticu sumnje u važnost studija (M=1,88). Srednje vrijednosti (M~4) vezane za čestice u podskali Akademska samoefikasnost pokazuju da se studenti često osjećaju učinkovito u savladavanju akademskih obveza.

Analizom ukupnog rezultata na odgovore iz upitnika utvrđeno je da visoku razinu sagorijevanja s obzirom na podskalu EI prijavljuje 25% ispitanika, a u podskali cinizam njih 19%. Za podskalu akademska efikasnost 27% ispitanika prijavljuje nisku akademsku samoefikasnost koja se tumači kao visoka razina sagorijevanja (Tablica 1). U Tablici 1 su prikazane i srednje vrijednosti odgovora, s rasponima razine sagorijevanja za podskale. Kao skupina, sudionici su prijavili umjereno izgaranje na svim trima podskalama.

no missing data. Descriptive statistics were used, including count measures (frequency and percentage) and measures of central tendency (mean and median). To test the normality of the distribution, the Kolmogorov-Smirnov test was used, which showed that the assumption of a normal distribution of the variables was not met. For this reason, non-parametric tests such as the Mann-Whitney U test and the Kruskal-Wallis test were used for the statistical analysis.

RESULTS

The descriptive analysis of the responses to the items of the emotional exhaustion subscale revealed that students generally show a feeling of exhaustion during their studies. Among the statements of the subscale, the item related to the strain of attending lectures all day (M = 3.72) stood out, and the respondents admitted to experiencing this strain frequently. The results of the cynicism subscale showed that students sometimes display a lack of enthusiasm for college and experience a cynical attitude towards their studies, with the lowest mean value associated with the item ‘doubts about the importance of studying’ (M = 1.88). The mean values (M~4) obtained for the items of the Academic self-efficacy subscale show that students often feel effective in coping with academic obligations. When analysing the overall results of the responses to the questionnaire, it was found that 25% of the respondents reported a high level of burnout on the EE subscale and 19% on the CY subscale. In the AS subscale, 27% of the respondents reported low academic self-efficacy, which is interpreted as a high level of burnout (Table 1). Table 1 also shows the mean values of the responses with ranges of the burnout level for each subscale. As a group, the participants reported moderate burnout on all three subscales.

Tablica 1. *Razina prisutnosti emocionalne iscrpljenosti, cinizma i akademske samoefikasnosti /* **Table 1.** *Extent of emotional exhaustion, cynicism, and academic self-efficacy among student teachers in STEM fields*

Subscale (M)	Burnout level	N of participants (%)
Emotional Exhaustion (16.3)	Low (0-10)	23 (27%)
	Moderate (11-22)	41 (48%)
	High (≥ 23)	21 (25%)
Cynicism (11.5)	Low (0-6.5)	21 (25%)
	Moderate (7-17)	48 (56%)
	High (≥ 18)	16 (19%)
Academic Self-Efficacy (23.7)	Low (0-19)	23 (27%)
	Moderate (20-28)	47 (55%)
	High (≥29)	15(18%)

M*, Mean*; N, *number of participants* N, broj sudionika; M*, srednja vrijednost*

Kako bi se ispitale razlike u pojavi osjećaja sagorijevanja za sve čestice u skali u odnosu na spol studenata, proveden je test Mann-Whitney U za nezavisne uzorke. Rezultati pokazuju da se statistički značajna razlika pojavljuje samo kod tvrdnje „Želim samo učiti I da mi ne smetaju“ (U=540, z = -2.213, p = .027). Analiza deskriptivne statistike za navedenu česticu pokazuje da tudent češće prijavljuju navedenu česticu od studentica (Tablica 2). Međutim, nije bilo statistički značajne razlike u usporedbi cijelih podskala u odnosu na spol (p > .05).

The Mann-Whitney U test was used to examine the differences in the occurrence of the feeling of burnout for all items of the scale in relation to the gender of the students. The results showed that there is a statistically significant difference only in relation to the following statement “I just want to study and not be disturbed” (U = 540, z = -2.213, p = 0.027). The analysis of the descriptive statistics for this item showed that male students agree with this statement more often than female students (Table 2). However, there was no statistically significant differences when comparing the entire subscales in relation to gender (p > 0.05).

Tablica 2. *Deskriptivna statistika za česticu* „Želim samo učiti I da mi ne smetaju“ *u odnosu na spol /* **Table 2.** *Descriptive statistics for item* “I just want to study and not be disturbed” *in relation to gender*

Item	Gender	N	M	Mdn	Mo	Min	Max
13) I just want to study and not be disturbed.	Male	26	3.38	4.00	4	0	5
	Female	59	2.68	2.00	2	0	6

M*, Mean;* Mdn*, Median;* Mo*, Mode;* Max, *maximum*; Min, *minimum*; N, *number of participants*.

Proveden je Kruskal-Wallisov test kako bi se utvrdile razlike u pojavi osjećaja sagorijevanja ovisno o vrsti studijskog programa koji se pohađa. Rezultati pokazuju da nema statistički značajne razlike (p>0,05) u emocionalnoj iscrpljenosti, cinizmu i akademskoj samoefikasnosti. Kako odgovori studenata iz različitih studijskih grupa nisu ravnomjerno zastupljeni, provedena je analiza studijskih grupa s većim brojem odgovora. Test Mann-Whitney, koji se upotrebljavao za utvrđivanje razlike u trima subskalama (EE, CY i AS)

The Kruskal-Wallis test was carried out to determine the differences in the occurrence of feelings of burnout depending on the type of degree or study programme the respondent was enrolled in. There were no statistically significant differences (p > 0.05) in the subscales EE, CY, and AS. Since the responses of the students from the different study groups were unevenly represented, further analysis was conducted focusing on study groups with a larger number of respondents. The Mann-Whitney U-test, which was used to determine the differences

između studijskih grupa Biologije i kemije i Informatike, pokazao je statistički značajnu razliku između navedenih studijskih grupa u podskali akademske samoefikasnosti (U= 271, z = -2,141, p = ,032) (Tablica 3). Deskriptivna analiza srednjih vrijednosti pokazuje da studenti biologije i kemije imaju veću akademsku samoefikasnost od studenata informatike (Tablica 4).

in the three subscales (EE, CY, and AS) between respondents from the biology and chemistry and computer science study groups, showed a statistically significant difference between the aforementioned study groups in the AS subscale (U = 271, z = - 2.141, p = 0.032; Table 3). The descriptive analysis of the mean values showed that biology and chemistry students have higher academic self-efficacy than computer science students (Table 4).

Tablica 3. *Rezultati testa Mann-Whitney U za studije Biologija i kemija i Informatika /* **Table 3.** *Results of the Mann-Whitney U-test for the biology and chemistry and the computer science study groups*

	Emotional Exhaustion	**Cynicism**	**Academic Self-Efficacy**
Mann-Whitney U	376.500	393.000	271.000
Wilcoxon W	872.500	744.000	767.000
Z	- 0.432	- 0.165	- 2.141
p	0.666	0.869	**0.032**

Tablica 4. *Deskriptivna statistika za podskalu AS za studije Biologije i kemije i Informatike /* **Table 4.** *Descriptive statistics for the AS subscale for the biology and chemistry and the computer science study groups*

Subscale	**Graduate study**	**N**	**M**	**Mdn**
Academic Self-Efficacy	Biology and Chemistry	26	**4.28**	4.25
	Computer Science	31	**3.74**	3.50

M*, Mean;* Mdn*, Median*; N, *number of participants*.

Testom Mann-Whitney U uspoređene su razlike u navedenim podskalama i između studijskih grupa Biologije i kemije i Informatike i tehnike. Rezultati pokazuju da postoji statistički značajna razlika u podskali Akademska samoefikasnost (U = 142, z = -1.998, p = .046) (Tablica 5). Srednje vrijednosti u Tablici 6 pokazuju da studenti biologije i kemije imaju veću akademsku samoefikasnost od studenata informatike i tehnike. Rezultati testa Mann-Whitney U testa koji se primjenivao za usporedbu studijskih grupa Informatike i Informatike i tehnike nisu pokazali statistički značajnu razliku (p > .05).

The Mann-Whitney test was also used to compare the differences in the above subscales between the biology and chemistry and the computer science and technics study groups. The results show a statistically significant difference in the AS subscale (U = 142, z = - 1.998, p = 0.046; Table 5). The mean values in Table 6 show that biology and chemistry students have higher academic self-efficacy than computer science and technics students. The results of the comparison of the computer science and the computer science and technics study groups show no statistically significant differences (p > 0.05).

Tablica 5. *Rezultati testa Mann-Whitney U za studije Biologija i kemija i Informatika i tehnika /* **Table 5.** *Results of the Mann-Whitney U-test for the biology and chemistry and the computer science and technics study groups*

	Emotional Exhaustion	Cynicism	Academic Self-Efficacy
Mann-Whitney U	195.500	196.500	142.000
Wilcoxon W	348.500	547.500	295.000
Z	- 0.648	- 0.630	- 1.998
p	0.517	0.529	**0.046**

Tablica 6. *Deskriptivna analiza odgovora AS podskale za studije Biologije i kemije i Informatike i tehnike /* **Table 6.** *Descriptive statistics of AS subscale for the biology and chemistry and the computer science and technics study groups*

Subscale	Graduate study	N	M	Mdn
Academic self-efficacy	Biology and Chemistry	26	**4.28**	4.25
	Computer Science and Technics	17	**3.81**	3.67

N, number of participants; M*, Mean;* Mdn*, Median*

Za utvrđivanje razlika u pojavi osjećaja sagorijevanja u odnosu na upisanu godinu studija proveden je test Mann-Whitney U za nezavisne uzorke. Rezultati pokazuju da postoji statistički značajna razlika kod čestica 13, 14 i 15 u odnosu na godinu studija (Tablica 7). Analiza srednjih vrijednosti pokazuje da studenti druge godine diplomskog studija češće izražavaju sumnju u važnost svog studija i imaju ciničan pogled na doprinos studija. Također su skloniji češćem izražavanju želje da se posvete samo učenju bez ometanja (Tablica 8). Međutim, kada se usporede cijele podskale u odnosu na godinu studija, rezultati testa Mann-Whitney U- ne pokazuju statistički značajnu razliku ($p > .05$).

Next, the Mann-Whitney U test was conducted to determine the differences in the occurrence of feelings of burnout for each item depending on the year of study. The results showed that there is a statistically significant difference in items 13, 14, and 15 (Table 7). The analysis of the mean values shows that students in their second year of study express doubts about the importance of their studies more frequently and evaluate the contribution of their studies cynically. They are also more likely to express the desire to devote themselves exclusively to their studies without distractions (Table 8). However, when comparing the entire set of subscales in relation to the year of study, the results of the Mann-Whitney U-test show no statistically significant differences ($p > 0.05$).

Tablica 7. *Rezultati testa Mann-Whitney U za čestice br. 13, 14 i 15 s obzirom na godinu studija /* **Table 7.** *Results of the Mann-Whitney U-test for items 13, 14, and 15 in relation to the year of study*

Item	Mann-Whitney U	Wilcoxon W	Z	p
13) I just want to study and not be disturbed.	642.500	1917.500	- 2.122	**0.034**
14) I am increasingly cynical when it comes to whether my studies contribute to anything.	565.500	1840.500	- 2.812	**0.005**
15) I doubt the importance of my studies.	638.500	1913.500	- 2.160	**0.031**

Tablica 8. *Pregled deskriptivne statistike za čestice 13, 14 i 15 prema upisanoj godini studija /* **Table 8.** *Overview of the descriptive statistics for items 13, 14, and 15 in terms of the year of study*

Item	Year of study	N	M	Mdn	Mo
13) I just want to study and not be disturbed.	Year 1	50	2.60	2.00	2
	Year 2	35	3.31	4.00	5
14) I am increasingly cynical when it comes to whether my studies contribute to anything.	Year 1	50	1.86	1.50	1
	Year 2	35	3.14	3.00	1
15) I doubt the importance of my studies.	Year 1	50	1.56	1.00	0
	Year 2	35	2.34	2.00	2

M*, Mean;* Mdn*, Median;* Mo*, Mode;* N, *number of participants*.

RASPRAVA

Ovim istraživanjem ispitana je pojava sindroma sagorijevanja kod studenata nastavničkih studija u STEM područjima na Prirodoslovno-matematičkom fakultetu u Splitu. Dodatno, ispitano je i postojanje razlika u sagorijevanju s obzirom na spol, vrstu studija i upisanu godinu studija. U obzir treba uzeti da usporedba rezultata sagorijevanja s drugima objavljenima u literaturi nije jednostavna, zbog različitih instrumenata i graničnih točaka koje su se primjenjivale za mjerenje sagorijevanja, različitih kriterija za definiranje sagorijevanja i, naposljetku, razlika u nastavnim planovima i programima između različitih fakulteta (Galàn i sur., 2011).

Kako bi se testirala prva hipoteza, provedena je deskriptivna analiza srednjih vrijednosti odgovora na čestice iz upitnika. Na temelju rezultata može se zaključiti da se Hipoteza 1 prihvaća. Ispitani studenti pokazuju umjerenu razinu sagorijevanja na studiju. Ovakvi rezultati u skladu su s istraživanjem koje su proveli Galàn i sur. (2011) nad studentima medicine (N=270) u Španjolskoj, a koji su iz rezultata s triju podskala sagorijevanja, iscrpljenosti, cinizmu i učinkovitosti, utvrdili umjerenu razinu sagorijevanja. Slične rezultate zabilježio je i Engin (2019), koji je kod studenata (N=265) završnih godina sedam različitih studijskih programa za obrazovanje nastavnika utvrdio umjerenu razinu sagorijevanja, koja se razlikovala s obzirom na program koji su pohađali. Suprotno tome, Celik & Oral (2013) odredili su nisku razinu sagorijevanja kod studenata arhitekture (N=208), s niskim rezultatima na podskalama cinizma i iscrpljenosti, a visokim na podskali efikasnosti.

DISCUSSION

This study investigated the occurrence of burnout syndrome in student teachers in STEM fields at the Faculty of Science in Split. In addition, the presence of differences in burnout in relation to gender, type of study, and year of study was investigated. It should be taken into account that it is not straightforward to compare the burnout results from the present study to those reported in the literature, given that research in this field has used different instruments and cut-off points to measure burnout, as well as different criteria to define burnout. Finally, there are distinct differences in the curricula of different faculties that could potentially have an effect on feelings of burnout among students (Galàn et al., 2011).

In order to test the first hypothesis, a descriptive analysis of the mean values of the responses to the questionnaire was carried out. From the results, it can be concluded that hypothesis 1 is accepted. The students who participated in the present study reported a moderate level of burnout . These results are consistent with the study conducted by Galàn et al. (2011) on medical students (N = 270) in Spain, who found a moderate level of burnout based on the results of the three subscales of burnout - exhaustion, cynicism, and efficiency. Similar results were reported in Engin (2019): moderate levels of burnout were observed in students (N = 265) from seven different teacher education programmes in recent years and these burnout levels varied depending on the programme that the student was enrolled in. In contrast, Celik & Oral (2013) found low levels of burnout among architecture students (N = 208), with low scores

Za testiranje druge hipoteze proveden je neparametrijski test Mann-Whitney U za nezavisne uzorke. Analizom razlika u odgovorima na sve čestice u skali u odnosu na spol, zabilježena je statistički značajna razlika za česticu "Želim samo učiti i da me ne smetaju". Odstupanja kod navedene čestice zabilježili su i Schaufeli i sur., (2002a), Schutte i sur., (2000), Campos i sur. (2012) i Wickramasinghe i sur. (2018) koji su česticu izbacili iz upitnika, zbog mogućnosti dvojnog tumačenja i remećenja valjanosti upitnika. I u ovom istraživanju neki su od ispitanika prilikom ispunjavanja upitnika prijavljivali nejasnoće vezane upravo za navedenu česticu, što može objasniti utvrđenu razliku.

Iz rezultata analize razlike u trima podskalama u odnosu na spol može se zaključiti da se Hipoteza 2 prihvaća. Ovakvi rezultati u skladu su s istraživanjem koje su proveli March-Amengual i sur., (2022) nad 506 studenata prve godine različitih zdravstvenih i nezdravstvenih studija. Među 37 sudionika (7,3%) kod kojih je utvrđena prisutnost sindroma sagorijevanja, utvrdili su da ne postoji statistički značajna razlika u sagorijevanju između muškaraca i žena. Istražujući pojavu sagorijevanja kod 270 studenata medicine u Španjolskoj, Galàn i sur. (2011) također nisu utvrdili postojanje značajne razlike u odnosu na spol ni za jednu od podskala sagorijevanja. Worly i sur. (2019) na uzorku od 654 studenta medicine utvrdili su da žene pokazuju značajno višu razinu emocionalne iscrpljenosti i profesionalne efikasnosti od muškaraca, dok su imale nižu razinu cinizma koja se nije statistički značajno razlikovala od muškaraca.

Prema Hipotezi 3 očekivano je da ne postoji statistički značajna razlika u podskalama emocionalne iscrpljenosti, cinizma i akademske samoefikasnosti s obzirom na vrstu studija. Kako bi se ispitala hipoteza, proveden je neparametrijski test Kruskal-Wallis za nezavisne uzorke. Rezultati su pokazali da ne postoji značajna razlika u podskalama u odnosu na vrstu studija. Zbog nejednake zastupljenosti broja odgovora studenata iz različitih studijskih grupa, uspoređeni su studiji s većim brojem odgovora (Biologija i kemija, Informatika, Informatika i tehnika) te je utvrđeno postojanje značajne razlike u podskali Akademon the cynicism and exhaustion subscales, as well as high scores on the efficiency subscale.

To test the second hypothesis, the non-parametric Mann-Whitney U test for independent samples was performed. When analysing the differences in the responses to all items of the scale in relation to gender, a statistically significant difference was found for item no. 13 "I only want to learn and not be disturbed". Deviations in the mentioned item were found by Schaufeli et al. (2002), Schutte et al. (2000), Campos & Maroco (2012), and Wickramasinghe et al. (2018): these authors chose to remove the item from the questionnaire due to the possibility of double interpretation and impairment of the validity of the questionnaire. In the present study, some of the respondents indicated ambiguity regarding the specified item when completing the questionnaire, which could explain the observed difference.

Hypothesis 2 was accepted based on the results of the analysis of the differences in the three subscales in relation to gender. These results are consistent with the study conducted by March-Amengual et al. (2022) with 506 first-year students from different health and non-health programmes. Among the 37 participants (7.3%) who were diagnosed with burnout syndrome, they found no statistically significant difference between men and women. Galàn et al. (2011), who investigated the occurrence of burnout in 270 medical students in Spain, also found no significant gender-specific differences for any of the burnout subscales. In a sample of 654 medical students, Worley et al. (2019) found that women had significantly higher levels of emotional exhaustion and professional efficiency than men, and they had lower levels of cynicism, but it was not significantly different from those of men.

According to hypothesis 3, it is expected that there is no statistically significant difference in the subscales of emotional exhaustion, cynicism, and academic self-efficacy in relation to the type of study. To test this hypothesis, a non-parametric Kruskal-Wallis test was conducted for independent samples. The results showed that there is no significant difference in the subscales in relation to the type of study. Due to the unequal representation of

ska samoefikasnost, koja je bila najizraženija kod studijske grupe Biologija i kemija. Na temelju ovih rezultata može se zaključiti da se Hipoteza 3 samo djelomično prihvaća, jer bi za precizniju usporedbu trebalo ispitati otprilike podjednak broj studenata sa svih studija koji se ispituju.

Iako su studenti čije se sagorijevanje uspoređuje u ovom istraživanju specifični, i istraživanja na takvom uzorku po trenutačnim nalazima nezabilježena u literaturi, postoje neka istraživanja u kojima se na sličan princip uspoređivalo sagorijevanje između različitih studija. March-Amengual i sur. (2022) proveli su istraživanje o pojavi sagorijevanja kod dvije kohorte studenata koje su uključivale studente zdravstvenih studija (medicina, sestrinstvo, fizioterapija, psihologija) i studente nezdravstvenih studija (društveno obrazovanje, biologija, biotehnologija, poslovni menadžment, novinarstvo, automobilizam i mehatronika). Nisu pronašli značajne razlike između studenata zdravstvenih i nezdravstvenih studija u akademskom sagorijevanju. Engin (2019) je također proveo istraživanje o sagorijevanju studenata sedam različitih studijskih programa (Usmjeravanje i psihološko savjetovanje, Obrazovanje društvenih znanosti, Osnovno obrazovanje, Predškolski odgoj, Obrazovanje turskog jezika, Obrazovanje prirodnih znanosti i Informacijske tehnologije) i utvrdio da među njima postoje razlike u sagorijevanju. Kao potencijalne razloge razlika navodi razinu afiniteta koji student ima prema studiju, različite nastavnike koji drže nastavu i različita opterećenja kolegija.

Kako bi se provjerila Hipoteza 4, proveden je test Mann-Whitney U za nezavisne uzorke. Rezultati pokazuju da nema značajne razlike za tri podskale u odnosu na godinu studija, što upućuje na prihvaćanje Hipoteze 4. Ipak, naknadno proveden test Mann-Whitney U za sve čestice u skali u odnosu na godinu studija pokazao je postojanje značajne razlike za tri čestice (br. 13, 14 i 15). Za česticu br. 13 *"Želim samo učiti i da mi ne smetaju"* razlika se može objasniti spomenutim neprikladnim oblikovanjem čestica koje rezultira dvojnim tumačenjem. Čestice br. 14 *"Sve sam ciničniji/a oko toga doprinosi li moj studij ičemu"* i br. 15 *"Sumnjam u važnost svojeg studi-*

the number of responses from students in different study groups, only the study groups with a higher number of responses (biology and chemistry, computer science, computer science and technics) were compared and a significant difference was found in the Academic Self-Efficacy subscale, which was most pronounced in the biology and chemistry study group. From these results, it can be concluded that hypothesis 3 was only partially confirmed. For a more precise comparison, an approximately equal number of students from all study groups examined should be investigated.

The present study examined burnout levels in a specific group of students based on their field of study. Although there is not much research on such a sample in the existing literature, there are a few studies in which burnout was compared between different study groups based on a similar principle. March-Amengual et al. (2022) investigated the prevalence of burnout in two cohorts of students from healthcare (medicine, nursing, physiotherapy, psychology) and non-healthcare (social pedagogy, biology, biotechnology, business administration, journalism, automotive engineering, and mechatronics) degree programmes. They found no significant differences between healthcare and non-healthcare majors in terms of academic burnout. Engin (2019) also reported differences in burnout levels of students in seven different degree programmes (counselling and psychological support, social science education, elementary education, preschool education, Turkish language teaching, science education, and information technology). As possible reasons for these differences, The author mentioned a few potential reasons for these differences in burnout levels, including the degree of affinity of the students to their studies, the methods used by their teachers to teach in classes, as well as dissimilarities in course loads.

To test hypothesis 4, the Mann-Whitney U test was performed for independent samples. The results showed that there was no significant difference for the three subscales in relation to the year of study, which indicates the acceptance of hypothesis 4. However, the subsequent Mann-Whitney U test for all items of the scale in relation to the year

ja.", studenti druge godine studija prijavljuju češće od studenata prve godine studija. Ovi rezultati u skladu su s istraživanjem koje su proveli Galàn i sur. (2011) nad studentima medicine (N=270) i utvrdili da studenti šeste godine studija pokazuju povećanje iscrpljenosti i cinizma, a značajno smanjenje samoefikasnosti u odnosu na studente treće godine studija. Štoviše, prevalencija rizika od sagorijevanja bila je značajno veća kod studenata viših godina u odnosu na studente nižih godina studija. Ovi zaključci slažu se i s istraživanjima koje su proveli Dyrbye i sur. (2006) i Elkins i sur. (2017) koji su za studente medicine utvrdili da napredovanjem u godinama studija imaju veći rizik od pojave sagorijevanja. López-Alegría i sur. (2020) uspoređujući studente primaljstva (N=140) utvrdili su da razina sindroma sagorijevanja raste s treće na četvrtu godinu studija od umjerene do visoke. Suprotne rezultate za studente medicine (N=769) dobili su Bogdan Ilić Živojinović i sur. (2019) koji su utvrdili da je postotak studenata s niskim rezultatima na MBI podskalama bio veći među studentima šeste godine u odnosu na studente druge godine.

OGRANIČENJA ISTRAŽIVANJA

Provedeno istraživanje ima nekoliko ograničenja. Podaci su prikupljani pred kraj nastavnog perioda u akademskoj godini, što je moglo utjecati na smanjenu motivaciju ispitanika da uopće ispune upitnik, kao i na povećanu razinu sagorijevanja zbog približavanja ispitnih rokova. Također, moguće je i da su upitnik radije ispunili oni studenti koji su već imali visoku razinu sagorijevanja pa im je ispunjavanje upitnika pomoglo u izražavanju izazova s kojima se suočavaju. Unutarnja dosljednost prevedene skale potvrđena je zadovoljavajućom vrijednošću Cronbachove alfe. Međutim, buduća istraživanja trebala bi validirati prevedenu MBI-SS skalu na većem i reprezentativnijem uzorku studenata učitelja u Hrvatskoj. Ova validacija osigurala bi prikladnost i pouzdanost skale u lokalnom kontekstu, čime bi se povećale vjerodostojnost nalaza i mogućnost njihove generalizacije. Dodatno je ograničenje istraživanja nedostatak dodatnih socio-demografskih podataka poput bračnog i financijskog statusa,

of study showed the existence of a significant difference for 3 items (No. 13, 14 and 15). For item no. 13 "I just want to study and not be disturbed", the difference can be explained by the inappropriate formation of the items mentioned above, which leads to ambiguity. Item no. 14 "I am increasingly cynical about whether my studies are worth anything" and no. 15 "I doubt the importance of my studies" were chosen more frequently by second-year students than by first-year students. These findings are consistent with the research conducted by Galàn et al. (2011) on medical students (N = 270), who found that sixth-year students showed an increase in exhaustion and cynicism and a significant decrease in self-efficacy compared to third-year students. In addition, the prevalence of burnout risk was significantly higher among students who had been studying longer than those with fewer years of study. These conclusions are also consistent with the research of Dyrbye et al. (2006) and Elkins et al. (2017), who found that medical students have a higher risk of burnout as the year of study progresses. López-Alegría et al. (2020) studied midwifery students (N = 140) and found that the level of burnout syndrome increased from moderate to high from the third to the fourth year of study. Bogdan Ilić Živojinović et al. (2019) came to the opposite conclusion in medical students (N = 769) and found that the percentage of students with low scores on the MBI subscales was higher in sixth-year students than in second-year students.

RESEARCH LIMITATIONS

The present study has several limitations. The data was collected towards the end of the academic year, which may have contributed to the respondents' low motivation level to complete the questionnaire, as well as to the increased level of burnout due to the approaching obligations related to exam deadlines. It is also possible that those students who already exhibited high levels of burnout preferred to complete the questionnaire, since completing the questionnaire helped them to express the challenges they were facing. While the internal consistency of the translated scale was supported by a satisfactory Cronbach's alpha, future research should validate the translated MBI-SS scale on a

akademskog uspjeha i prethodnog obrazovanja, koji bi također mogli utjecati na razinu sagorijevanja. Ovi podaci izostavljeni su kako bi upitnik bio što jednostavniji. Osim toga, uzorak ispitanika sastoji se samo od studenata nastavničkih studija u STEM-u s jednog fakulteta, što ograničava mogućnost generalizacije rezultata. Kako bi se ovo prevladalo, buduća istraživanja trebala bi uključivati ispitanike s istih ili sličnih studija na drugim sveučilištima u Hrvatskoj ili šire.

ZAKLJUČAK

Iako je opsegom ograničeno, ovo istraživanje pruža doprinos saznanjima o pojavi sindroma sagorijevanja u studentskoj populaciji. Studenti nastavničkih studija u STEM područjima imaju visoke zahtjeve studija koji uključuju razvoj različitih pedagoških kompetencija kao i stjecanje specijaliziranih znanja i vještina u području uže struke. Prisutnost umjerene razine sagorijevanja izravan je pokazatelj opterećenosti studenata studijem, što u konačnici smanjuje kvalitetu obrazovnog procesa, a time i mogućnost postizanja svih planiranih ishoda učenja. U vremenu kada se nastavnički posao sve manje cijeni, a potreba za kvalitetnim obrazovnim kadrom raste, potrebno je kod studenata povećati svijest o važnosti nastavničkog zanimanja, ali i provoditi smislene reevaluacije i usavršavanja studijskih programa kako bi se unaprijedilo njihovo akademsko obrazovanje. Nalazi iz ovog istraživanja mogu ukazati i na potrebu za aktivnim razvojem i provedbom programa intervencije za smanjivanje sagorijevanja među studentima koji se obrazuju za posao nastavnika. Uzimajući sve navedeno u obzir, potrebno je kontinuirano provoditi daljnja istraživanja kako bi se ispitali svi aspekti sagorijevanja koji se mogu pojaviti kod budućih nastavnika.

larger and more representative sample of student teachers in Croatia. This validation would ensure the scale's appropriateness and reliability in the local context, thereby strengthening the support for the findings and enhancing their generalisability. Another limitation of the study is the lack of additional socio-demographic data such as marital status, financial status, academic success, and previous education, which could also affect the level of burnout: these questions were not addressed in this research in order to simplify the questionnaire as much as possible. Additionally, the sample was limited to student teachers in STEM subjects from a single faculty, which restricts the generalisability of the findings. To overcome this, further research on this topic should include respondents from the same or similar study programmes at other universities in Croatia or beyond.

CONCLUSION

Although the scope of this study is limited, it contributes to the knowledge about the occurrence of burnout syndrome in the student population. Student teachers in STEM subjects are confronted with demanding study requirements that include the development of various pedagogical competencies, as well as the acquisition of specialised knowledge and skills in their chosen field. The presence of moderate levels of burnout is a direct indicator of student workload, which ultimately reduces the quality of the educational process and thus, the possibility of achieving the intended learning outcomes. At a time when the teaching profession is becoming less valued and the need for qualified teaching staff is increasing, it is necessary to raise students' awareness of the importance of the teaching profession, but also to make meaningful re-evaluations and improvements to study programmes in order to improve their academic education. The results of this study may also indicate the need to actively develop and implement intervention programmes to reduce burnout among student teachers. Taking these factors into consideration, it is necessary to conduct further research to investigate all aspects of burnout that may occur in future teachers.

REFERENCES

Backović, D. & Jevtić, M. (2012). Burnout sindrom kao problem mentalnog zdravlja studenata medicine [Burnout syndrome as a mental health problem of medical students]. *Medicinski Pregled, 3-4*, 129-132. https://doi.org/10.2298/MPNS1204129B

Bianchi, R., Schonfeld, I. S., & Laurent, E. (2015). Burnout-depression overlap: a review. *Clinical Psychology Review, 36*, 28-41. https://doi.org/10.1016/j.cpr.2015.01.004

Bogdan Ilić Živojinović, J., Backović, D., Soldatović, I. & Belojević, G. (2019). Correlates of Burnout Syndrome among Belgrade Medical Students – A Cross-Sectional Study. *Croatian Journal of Education*, 21 (4), 1213-1230. https://doi.org/10.15516/cje.v21i4.3352

Bolatov, A.K., Seisembekov, T.Z., Askarova, A.Z., Igenbayeva, B., Smailova, D.S. & Hosseini, H. (2021). Psychometric properties of the copenhagen burnout inventory in a sample of medical students in Kazakhstan. *Psych Rus State Art*, 14(2):15–24. https:// doi. org/ 10. 11621/ pir. 2021. 0202.

Boudreau, D., Santen, S.A., Hemphill, R.R., & Dobson, J. (2004). Burnout in medical students: Examining the prevalence and predisposing factors during the four years of medical school. *Annals of Emergency Medicine*, 44(4), S75–S76. http://dx.doi.org/10.1016/j.annemergmed.2004.07.248

Brenninkmeijer, V., Van Yperen, N. (2003). How to conduct research on burnout: advantages and disadvantages of a unidimensional approach in burnout research. *Occup Environ Med* 60:16–20.

Çam, Z. & Deniz, K. & Kurnaz, A. (2014). School Burnout: Testing a Structural Equation Model Based on Percieved Social Support, Perfectionism and Stress Variables. *Egitim ve Bilim*. 39. 312-327.

Campos, J.A. & Maroco, J. (2012). Maslach Burnout Inventory - Student Survey: Portugal-Brazil cross-cultural adaptation]. *Rev Saude Publica*. 46(5):816-24. Portuguese. doi: 10.1590/s0034-89102012000500008. PMID: 23128258.

Celik, G. T. & Oral, E. L. (2013). Burnout Levels and Personality Traits—The Case of Turkish Architectural Students, *Creative Education*, Vol.4, No.2, 124-131

Chang, E. C., Rand, K. L., & Strunk, D. R. (2000). Optimism and risk for job burnout among working college students: Stress as a mediator. *Personality and Individual Differences*, 29(2), 255–263.

Chang, E., Lee, A., Byeon, E., Seong, H., & Lee, S. M. (2016). The mediating effect of motivational types in the relationship between perfectionism and academic burnout. *Personality and Individual Differences*, 89, 202–210. https:// doi. org/ 10. 1016/j. paid. 2015. 10. 010

Cilliers, J. R., Mostert, K., & Nel, J. A. (2017). Study demands, study resources and the role of personality characteristics in predicting the engagement of fist-year university students. *South African Journal of Higher Education*, 32(1). https:// doi. org/ 10. 20853/ 32-1- 1575

D'Aurora, D. L., & Fimian, M. J. (1988). Dimensions of life and school stress experienced by young people. *Psychology in the Schools*, 25(1), 44–53.

de la Fuente, J., La Hortiga-Ramos, F., Laspra-Solís, C., Maestro-Martín, C., Alustiza, I., Aubá, E. & Martín-Lanas, R. A (2020). Structural Equation Model of Achievement Emotions, Coping Strategies and Engagement-Burnout in Undergraduate Students: A Possible Underlying Mechanism in Facets of Perfectionism. *Int. J. Environ. Res. Public Health*, 17, 2106.

Demerouti, E., & Nachreiner, F. (1998). Zur Spezifität von Burnout für Dienstleis-tungsberufe: Fakt oder Artefakt [The specificity of burnout for human services:Fact or artefact]. *Zeitschrift für Arbeitswissenschaft*, 52, 82–89.

Demerouti, E., Bakker, A. B., Nachreiner, F., & Schaufeli, W. B. (2001). The job demands-resources model of burnout. *Journal of Applied Psychology*, 86(3),499–512. http://dx.doi.org/10.1037/0021-9010.86.3.499

Demerouti, E., Bakker, A. B., Vardakou, I., & Kantas, A. (2003). The convergent validity of two burnout instruments. *European Journal of Psychological Assessment*, 19(1),12–23. http://dx.doi.org/10.1027//1015-5759.19.1.12

Durán, A., Extremera, N., Rey, L., Fernández-Berrocal, P. & Montalbán, F.M. (2006). Predicting Academic Burnout and Engagement in Educational Settings: Assessing the Incremental Validity of Perceived Emotional Intelligence beyond Perceived Stress and General Self-Efficacy. *Psicothema*, 18, 158–164.

Dyrbye, L. N., Thomas, M. R., Huntington, J. L., Lawson, K. L., Novotny, P. J., Sloan, J. A. & Shanafelt, T.D. (2006). Personal life events and medical student burnout: A multicenter study. *Academic Medicine*, 81(4), 374–384. http://dx.doi.org/10.1097/00001888-200604000-00010

Elkins, C., Plante, K. P., Germain, L. J., & Morley, C. P. (2017). Burnout and depression in MS1 and MS3 years: A comparison of cohorts at one medical school. *Family Medicine*, 49(6), 456–459. http://www.stfm.org/Portals/49/Documents/FMPDF/FamilyMedicineVol49Issue6Elkins456.pdf

Engin, G. (2019). Determine Pre-Service Teachers' Burnout Levels and Anxiety of Not to be Appointed to Teacher Profession. *Educational Policy Analysis and Strategic Research*, 14(2), 29-44. doi: 10.29329/epasr.2019.201.2

Esteve, E. B. (2003). Well-being and performance in academic settings: The predicting role of self-efficacy (Doctoral dissertation). Jaume University, Spain.

Fiorilli, C., De Stasio, S., Di Chiacchio, C., Pepe, A., & Salmela-Aro, K. (2017). School burnout, depressive symptoms and engagement: Their combined effect on student achievement. *International Journal of Educational Research*, 84, 1–12. https:// doi. org/ 10. 1016/j. ijer. 2017. 04. 001

Fimian, M. J., & Cross, A. H. (1986). Stress and burnout amoung preadolescent and early adolescent gifted students: A preliminary investigation. *The Journal of Early Adolescence*, 6(3), 247–267. https:// doi. org/ 10. 1177/ 02724 31686 063004

Freudenberger, H., J. (1974). Staff burnout, *Journal of Social Issues*, 30, 159-165

Galán, F., Sanmartín, A., Polo, J., Giner, L. (2011). Burnout risk in medical students in Spain using the Maslach Burnout Inventory-Student Survey. *Int Arch Occup Environ Health*, 84(4):453-9. doi: 10.1007/s00420-011-0623-x. Epub 2011 Mar 4. PMID: 21373879.

Garden, A.M. (1991). Relationship between burnout and performance. *Psychological Reports*, 68(3), 963–977. https:// doi. org/ 10. 2466/ pr0. 1991. 68.3. 963

Green, D. E., Walkey, F. H. & Taylor, A. J. W. (1991). The three factor structure of the Maslach Burnout Inventory. *Journal of Social Behavior and Personality*, 6, 453–472.

Guthrie, E., Black, D., Shaw, C., Hamilton, J., Creed, F., Tomenson, B. (1997). Psychological stress in medical students: a comparison of two very different courses. *Stress Med* 13:179–184.

Halbesleben, J. R. B., & Demerouti, E. (2005). The construct validity of an alternativemeasure of burnout: Investigating the English translation of the Oldenburg Burnout Inventory. *Work and Stress*, 19(3), 208–220. http://dx.doi.org/10.1080/02678370500340728

Herrmann, J., Koeppen, K., & Kessels, U. (2019). Do girls take school too seriously? Investigating gender differences in school burnout from a self-worth perspective. *Learning and Individual Differences*, 69, 150–161. https:// doi. org/ 10. 1016/j. lindif. 2018. 11. 011

Huibers, M. J. H., Beurskens, A. J. H. M., Prins, J. B., Kant, I. J., Bazelmans, E.,Van Schayck, C. P., et al. (2003). Fatigue, burnout, and chronic fatigue syndrome among employees on sick leave: Do attributions make the difference? *Occupational and Environmental Medicine*, 60(Suppl. 1), i26–i31. http://dx.doi.org/10.1136/oem.60.suppl 1.i26

Jagodics, B., Kóródi, K., & Szabó, É. (2021). A Diák Kiégés Kérdőív szerkezetének vizsgálata magyar mintán [Examining the structure of the Student Burnout Questionnaire on the Hungarian sample]. *Magyar Pszichológiai Szemle*, 76(1), 1–22. https:// doi. org/ 10. 1556/ 0016. 2021. 00020

Jagodics, B. & Szabó, É. (2022). Student Burnout in Higher Education: A Demand-Resource Model Approach. *Trends in Psychology*. 10.1007/s43076-021-00137-4.

Karasek, R. A. (1979). Job demands, job decision latitude, and mental strain: Implications for job redesign. *Administrative Science Quarterly*, 24(2), 285–308. http://dx.doi.org/10.2307/2392498

Kristensen, T. S., Borritz, M., Villadsen, E. & Christensen, K. B. (2005). The Copenhagen Burnout Inventory: A new tool for the assessment of burnout. *Work & Stress*, 19, 192–207.

Leiter, M. P., & Schaufeli, W. B. (1996). Consistency of the burnout construct across occupations. *Anxiety, Stress, and Coping*, 9(3), 229–243. http://dx.doi.org/10.1080/10615809608249404

Leone, S. S., Huibers, M. J., Knottnerus, J. A., & Kant, I. (2008). The prognosis of burnout and prolonged fatigue in the working population: A comparison. *Journal of Occupational and Environmental Medicine*, 50(10), 1195–1202.

López-Alegría, F., Oyanedel, J. C., & Rivera-López, G. (2020). Burnout Syndrome in Chilean Midwifery Students. *SAGE Open*, 10(1). https://doi.org/10.1177/2158244020902090

March-Amengual, J.-M., Cambra Badii, I., Casas-Baroy, J.-C., Altarriba, C., Comella Company, A., Pujol-Farriols, R., Baños, J.-E., Galbany-Estragués, P., Comella Cayuela, A. (2022). Psychological Distress, Burnout, and Academic Performance in First Year College Students. *Int. J. Environ. Res. Public Health* 19, 3356. https://doi.org/10.3390/ijerph19063356

Martinko, J. (2010): Profesionalno sagorijevanje na poslu nastavnika u obrazovanju odraslih [Professional burnout on the job of teachers in adult education]. *Andragoški glasnik* Vol. 14, br. 2, 2010, str. 99-110.

Maslach, C., Jackson, S., E. (1981). The measurement of experienced burnout. *Journal of Occupational Behaviour*, 2 , 99–113.

Maslach, C., Jackson, S. E., & Leiter, M. P. (1996). Maslach Burnout Inventory: Manual (3 ed.). Palo Alto, CA: Consulting Psychologists Press.

Maslach, C., Schaufeli, W. B. & Leiter, M. P. (2001). Job burnout. Annual Review of Psychology, 52, 397–422.

Maslach, C., Leiter, M. P., & Schaufeli, W. B. (2008). Measuring burnout. In C. L.Cooper, & S. Cartwright (Eds.), *The Oxford handbook of organizational well-being* (pp. 86–108). Oxford: Oxford University Press.

Meier, S. T., & Schmeck, R. R. (1985). The burned-out college student: A descriptive profile. *Journal of College Student Personnel*, 26(1), 63–69.

Prins, J.T., Gazendam-Donofrio, S.M., Tubben, B.J., Van der Heijden, F.M., Van de Wiel, H.B., Hoekstra-Weebers, J.E. (2007). Burnout in medical residents: a review. *Med Educ* 41:788–800.

Reis, D., Xanthopoulou, D., Tsaousis, I. (2015). Measuring job and academic burnout with the Oldenburg Burnout Inventory (OLBI): Factorial invariance across samples and countries, Burnout Research, 2(1), 2015, 8-18. https://doi.org/10.1016/j.burn.2014.11.001.

Santen, S.A., Holt, D.B., Kemp, J.D., Hemphill, R.R. (2010). Burnout in medical students: examining the prevalence and associated factors. *South Med J* 103:758–763

Schaufeli, W. B., Leiter, M. P., Maslach, C., & Jackson, S. E. (1996). Maslach burnout inventory – General survey. In C. Maslach, S. E. Jackson, & M. P. Leiter (Eds.), The Maslach Burnout Inventory-Test Manual (pp. 19–26). Palo Alto, CA: Consulting Psychologists Press.

Schaufeli, W. B., & Taris, T. W. (2005). The conceptualization and measurement of burnout: Common ground and worlds apart. *Work and Stress*, 19(3), 256–262. http://dx.doi.org/10.1080/02678370500385913

Schaufeli, W. B., Leiter, M. P., & Maslach, C. (2009). Burnout: 35 years of research and practice. *Career Development International*, 14(3), 204–220. http://dx.doi.org/10.1108/13620430910966406

Schaufeli, W. B., Martínez, I. M., Pinto, A. M., Salanova, M., & Bakker, A. B. (2002). Burnout and engagement in university students. A cross-national study. *Journal of Cross-Cultural Psychology*, 33(5), 464. http://dx.doi.org/10.1177/0022022102033005003

Schutte, N., Toppinen, S., Kalimo, R., Schaufeli, W.B. (2000). The factorial validity of the Maslach Burnout Inventory-General Survey (MBI-GS) across occupational groups and nations. *J Occup Organ Psychol* 73:53–66.

Seibert, G. S., May, R. W., Fitzgerald, M. C., & Fincham, F. D. (2016). Understanding school burnout: Does self-control matter? *Learning and Individual Differences*, 49, 120–127. https:// doi. org/ 10.1016/j. lindif. 2016. 05. 024

Shih, S.-S. (2015). An investigation into academic burnout among Taiwanese adolescents from the self-determination theory perspective. *Social Psychology of Education*, 18(1), 201–219. https:// doi. org/10. 1007/ s11218- 013-9214-x

Shirom, A. & Melamed, S. (2005). Does burnout affect physical health? A review of the evidence. In A. Antoniou & C. Cooper (Eds.), Research companion to organizational health psychology (pp. 599–622).

Shirom, A., & Melamed, S. (2006). A comparison of the construct validity oftwo burnout measures in two groups of professionals. *International Journal of Stress Management*, 13(2), 176–200. http://dx.doi.org/10.1037/1072-5245.13.2.176

Shirom, A. (1989). Burnout in work organizations. In *International Review of Industrial and Organizational Psychology*. Wiley.

Taris, T. W., Le Blanc, P. M., Schaufeli, W. B., & Schreurs, P. J. G. (2005). Are there causal relationships between the dimensions of the Maslach Burnout Inventory? A review and two longitudinal tests. *Work and Stress*, 19(3), 238–255.

Tuominen-Soini, H., Salmela-Aro, K., & Niemivirta, M. (2012). Achievement goal orientations and academic well-being across the transition to upper secondary education. *Learning and Individual Differences*, 22(3), 290–305. https:// doi. org/ 10. 1016/j. lindif. 2012. 01. 002

Wickramasinghe, N.D., Dissanayake, D.S. & Abeywardena, G.S. (2018). Validity and reliability of the Maslach Burnout Inventory-Student Survey in Sri Lanka. *BMC Psychol*., 6(1):52. doi: 10.1186/s40359-018-0267-7. PMID: 30419960; PMCID: PMC6233560.

World Health Organization. (2019). International statistical classification of diseases and related health problems (11th revision). https:// icd. who. int/ brows e11/l- m/ en.

Worly, B., Verbeck, N., Walker, C., Clinchot, D.M. (2019). Burnout, perceived stress, and empathic concern: differences in female and male Millennial medical students. *Psychol Health Med.,* 4:429-438. doi: 10.1080/13548506.2018.1529329. Epub 2018 Oct 7. PMID: 30295048.

Yang, H.-J., & Farn, C. K. (2005). An investigation the factors affecting MIS student burnout in technical–vocational college. *Computers in Human Behavior*, 21(6),917–932. http://dx.doi.org/10.1016/j.chb.2004.03.001