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Investigations on the determinants of mental health and options for health promotion among medical students

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1. INTRODUCTION

The mental health of medical students tends to be poorer compared to their non-medical peers. Anxiety, depression and burnout worsen academic performance, leading to increased cynicism, substance abuse problems and even a higher risk of suicide. A 2016 meta-analysis by Rotenstein and colleagues included 195 studies with more than 120,000 medical students in 43 countries. According to the results, 27.2% of students showed depressive symptoms, and one in ten students reported suicidal thoughts during their years at university. Medical students also had higher suicide rates than the general population of the same age, which remained elevated after graduating from medical school.

Hungarian studies published in the early 2000s also gave accounts of the problem. Nearly 30% of medical students at Semmelweis University reported high levels of distress. About one in five medical students were found to have pathological levels of psychological distress at the University of Debrecen in 2010. Surveys of medical students at Semmelweis University and the University of Szeged found that approximately 20% of students experienced high levels of emotional distress, and around 60% experienced moderate levels. In a 2013 study

conducted on a mixed sample of the Semmelweis University and the University of Debrecen a quarter of medical students reported frequent fatigue and cynicism, while more than half felt a significant drop in their productivity. The prevalence of smoking was 17.6%, alcohol consumption of any kind was 79.6% in a 2015 study of medical students at Semmelweis University indicating negative ways of coping with challenges. 83% of medical students consumed alcohol, 29% smoked daily or occasionally, 14% tried marijuana, and 8% used sedatives or sleeping pills without a doctor's recommendation according to previous surveys conducted at the University of Debrecen.

An important feature of mental health is motivation to perform tasks and, in the case of university students, to learn. Motivation, according to Ryan and Deci's theory of self-determination, ranges along a spectrum from internally driven intrinsic motivation for self-actualisation via extrinsic motivation influenced by external expectations and considerations, to amotivation indicating lack of intention. However, the widely used methodology for examining academic motivation needed improvement to clarify its relationship with mental health among students.

A further problem with improving the mental health of university students has been that less than a fifth of students in need of help tend to use adequate mental health care for a host

of reasons. However, to avoid the potentially negative life trajectory that can follow formative years of student lives spent with mental health problems, it is important to increase use of care among students so that future doctors enter their careers not only professionally but also mentally prepared.

However, mental health interventions are not only used by a limited number of medical students but there has been no information on their effectiveness. Interventions are usually implemented through top-down initiatives while the Ottawa Charter for Health Promotion guidelines state that participants should be involved in the planning, implementation and evaluation of interventions. This is particularly true for young professionals who will themselves use health promotion interventions in their future work.

In view of the above, the overall aim of our research was to uncover the most significant sources of distress in medical education at the University of Debrecen including types of academic motivation, and to identify appropriate organisational-level interventions, among them online psychological interventions that would be most relevant to the needs of most students. We aimed at investigating all the above using a person-centred approach which was applied in both our qualitative and quantitative research.

2. AIMS

1. We aimed at identifying the sources of distress considered most important by medical students.

2. We also wanted to identify the organizational options for prevention and intervention that can be extended to a wide range of students and that best reflect their needs.

2.1 One of our specific objectives was to get a comprehensive picture of the stressors and possibilities to reduce them from the students' perspective.

2.2 Our second specific objective was to identify deterrents that hinder the use of university mental health services among medical students; and options to overcome or mitigate these factors at the organizational level.

3. A further aim was to develop and test a new method of evaluating the Academic Motivation Scale in order to identify distinct motivational profiles that are associated with mental health among first-year medical students.

4. The last aim was to investigate the patterns of uptake of interventions provided through a complex mental health service adapted to an online platform.

3. MATERIALS AND METHODS

3.1. Factors negatively affecting the mental health of medical students and possible points for interventions

Sample

Participants were recruited from medical students at years I-VI of the Faculty of General Medicine of the University of Debrecen, from both the Hungarian and the English-language program. We planned two Hungarian and two English focus groups, i.e. 4 groups in total, with a minimum of 6 and a maximum of 10 participants. In order to widen access to participants, a snowball sampling method was used. Ethics approval number of the study: DE RKEB/IKEB 5821-2021.

Structure of the interviews

Semi-structured focus group interviews were planned to identify the stressors experienced by students and possible solutions to address them. The interviews aimed at exploring two main themes: (1) stressors contributing to the poor mental health of medical students, and potential interventions to address them; and (2) barriers to accessing psychological

counselling available at the university, and potential interventions to overcome these barriers. The methodology and results related to the second set of questions are discussed in separate chapters.

Topics for the first set of questions were defined at two levels: university (organizational) and individual level stressors and interventions. Within these, main themes and sub-themes were identified and associated with thematic opening questions. The interviews started with an introduction and general information about the procedure, followed by a total of 4 main themes and 16 sub-themes within the first set of questions at two levels (university level: 1. academic problems 2. problems with organizational communication 3. problems related to peer relationships; individual level: 4. difficulties related to individual characteristics).

Data collection

Participation in the focus groups was voluntary and anonymous. The interviews took place in November and December 2020 in an online audio-recorded format due to restrictions on personal contact because of the coronavirus outbreak. The personal identities of the participants were not recorded. Neither the moderator of the focus group (the author of the thesis) nor the moderator's assistant (a health psychology MSc student) had

any formal or informal contact with the participants before and after the interviews.

Data analysis

360 minutes of audio files were transcribed verbatim resulting in a total of 46,874 words of text.

Qualitative content analysis from coding to deductive analysis was carried out by the focus group moderator and his assistant independently, both manually and using NVivo content analysis software, following Mayring's content analysis method. Coding was performed separately for each focus group per analyst using deductive-inductive qualitative content analysis. The main themes of the interview were transformed into main categories and the sub-themes identified as sources of stress were transformed into sub-categories (deductive category building). After comparing the independent systems of the two analysts and discussing differences, the final consensus-based category system was developed.

3.2. Barriers to psychological help-seeking and possible interventions to reduce them among medical students

Structure of the interviews

The second aim of the qualitative study was to explore the views of medical students on the barriers and their possible elimination to the mental health services available at the University of Debrecen.

Data analysis

The interviews related to the first and second main topics were separated in the audio recordings that was described under „Data collection" in chapter 3.1. A word-by-word transcription of the second theme's audio recordings, 120 minutes in total, resulted in a text of 15,625 words which was subjected to content analysis by the two independent coders using the same method described in „Data analysis" in chapter 3.1. The research questions on barriers to help-seeking and suggestions to overcome them were deductively transformed into main categories. The research questions on openness to and acceptance of different formats of online counselling and preference for online or face-to-face counselling were translated

into 8 main categories. The content analysis units were then grouped into major categories using deductive coding, and the number of units per category was summed.

3.3. Academic motivational profiles and their association with mental health among first-year medical students

Sampling and data collection

A cross-sectional study to investigate the relationship between school motivation and mental health was designed. All first-year medical students of the University of Debrecen were invited to participate by email through the administrative system of the university in the first two weeks of the first examination period following semester 1 of the academic year 2021/22, with a total of three reminders. The invitation included information about the survey and a link to the online questionnaire available at a university server.

Measures

Academic Motivation Scale (AMS-28)

The Academic Motivation Scale has been widely used to assess the three main types of motivation with 28 items on a 7-point

Likert scale, divided into seven subscales (intrinsic motivation to (1) know, (2) accomplish, (3) to experience stimulation, as well as extrinsic motivation: (4) externally controlled, (5) introjected, (6) identified; and (7) amotivation). The standard scoring of the questionnaire produces averages of the subscales and the sum of the items describing the main types of motivation, but does not allow the allocation of respondents into the three main categories of motivation.

General Health Questionnaire (GHQ-12)

The 12-item version of the "General Health Questionnaire" (GHQ-12) estimates the risk of psychological morbidity due to psychological distress. Items in the questionnaire are answered on a 4-point Likert scale. The methodology for assessing the questionnaire was adapted from the report of the National Population Health Survey (OLEF) which results in respondents being classified as at low or high risk for psychological distress.

Satisfaction with life

Respondents were asked "Overall, how satisfied are you with your life in general?" on a scale from 0 ("Not at all") to 10 ("Totally").

Statistical analysis

After descriptive statistical analysis of the data, correlations of the categorical variables were tested using Fischer's exact test in case of a 2x2 design, and Pearson's chi-square test in other cases. Regarding continuous variables, the Kolmogorov-Smirnov test was used for the analysis of distribution. Gender differences in the AMS-28 subscales, GHQ-12 total score and life satisfaction were tested using Mann-Whitney test. Pearson correlation was used for correlation analyses. Cronbach's alpha coefficients were calculated to examine the internal consistency of the questionnaires. In order to define motivational profiles corresponding to the three main types of academic motivation, a two-step cluster analysis was performed and, after creating quantile variables, these were analysed as binary variables.

3.4. Transfer of mental health services to cyberspace: service use and student preferences for psychological self-help techniques

Our department had provided for many years a mental health service for students in the form of face-to-face counselling called "Ariadne's Thread". Following the introduction of restrictions due to the COVID-19 pandemic in March 2020, we

adapted this service in 3 weeks into a virtual (online) format enlarging it with a wide range of self-help content available in both English and Hungarian. The complex service package was hosted on the distance learning portal of the university.

Sampling and data collection

All Hungarian and international medical students of the university were notified of the availability of the online service in April 2020 via the university's administration system, followed by two further reminders. Data on the access to the service on the distance learning portal and use of its content were retrieved from the database generated by the distance learning system based on the automatic logging of online activities. The name and the type of course (English or Hungarian) of the students could directly be identified through their university ID along with information whether the student was following a recommended study plan or an individual study plan due to unsuccessful exams. Data on use of the service was analysed for a period of 1 year, from the launch of the service (15 April 2020) until 15 April 2021.

Statistical analysis

Besides descriptive statistics, the relationship between categorical variables was tested using Pearson's chi-square test.

Continuous variables did not follow a normal distribution so their correlations were analysed using the Mann-Whitney test.

4. RESULTS

4.1. Factors negatively affecting the mental health of medical students and possible points for intervention

1. Description of the sample

A total of 26 students (13 Hungarian and 13 foreign) participated in the four focus groups. Foreign students in the English language course came from 10 different countries. The groups consisted of 6-7 students. We had participants from all six years of the general medical training: 4 students from year 1, 6 from year 2, 3 from year 3, 5 from year 4, 7 from year 5 and one from year 6. The mean age of the participants was 21.8 years (SD = 1.88). In terms of gender, males were in the majority (n = 16, 73%). The sample was not representative of the medical student population in terms of gender and year of study. The interviews lasted on average of one and a half hours, with a total duration of 360 minutes. The recordings of the interviews provided 46,874 words after word-for-word

transcription. Content analysis resulted in the identification of 4 main categories, 24 subcategories and 80 codes.

2. Studies (organisational level)

The stressors related to education were: the excessive amount of required course material, the insufficient transfer of information, low motivation of some teachers, the quality and quantity of teaching aids, the lack of practical training, the strict absence policy, the difficulty of preparing the thesis, and, for Hungarian students, the inconsistencies in the course material and problems with the syllabus.

Among the suggestions for solutions were shortening the required curriculum (only in Hungarian), providing more resources and aids (only in English), introducing training to improve individual learning techniques, publishing and standardising institute materials and notes, more practice-oriented teaching, small group case discussions, a more understanding attitude towards absences due to illness, more help and information for thesis preparation, and making anatomy part of the curriculum from the first semester.

Students also identified stressors related to the examinations: Hungarian students highlighted that they felt that the examination periods were overcrowded, especially from the third year onwards, and that long waiting times for exams were

also a problem. International students expressed concern that their knowledge is assessed only on the basis of their performance in examinations, and mid-semester presentations, reports and submissions do not count. For Hungarians, the expectation of achieving the minimum required grade point average was a particular source of stress, averting the risk of being transferred to self-financing.

As regards to reducing these stressors, in addition to changes in the way assessments are organised, the introduction of mid-semester submissions and presentations and their inclusion in the final grade were suggested. Hungarian students felt that those have to follow individual study plan due to an unsuccessful exam may need increased mental health support.

3. Communication at the University (organisational level)

Among the stressors associated with organisational communication, students mentioned late information, insufficient information, and sometimes negative perceived organisational treatment.

In this regard, they suggested improving the university information network and reducing the overload of lecturers; internationals also suggested the development of a group mentoring programme and intercultural sensitisation.

4. Student relations (organisational level)

In the area of social relations, internationals had difficulties with integration at the beginning of their studies, and bridging cultural differences. Among Hungarian students, perceived contempt for students who have failed exams resulting in individual study plan is a source of social stress.

They suggested more involvement of group leaders in solving peer problems and more community programmes for internationals.

5. Individual characteristics (individual level)

Stressors at this level generally included time management difficulties, inadequate learning techniques, insufficient stress management skills, individual career prospects, gender differences, and certain personality traits (e.g. perfectionism, introversion).

To address these, suggestions were made for skills training, better timing of assessments (only by Hungarians), reduction of requirements (only by Hungarians), individual psychological counselling, self-help groups, psychoeducation (only by Hungarians), screening for psychological readiness to study medicine (only by Hungarians), more effective career counselling, and the introduction of organisational risk management interventions.

4.2. Barriers to psychological help-seeking and possible interventions for their reduction among medical students

1. Description of the sample

Discussion of the second main topic of the focus group interviews took 120 minutes out of the total of 480 minutes, about 30-30 minutes per group. The audio material amounted to 15,625 words after transcription. The sample was identical to the one described in Section 4.1 of the Results chapter. A total of 11 different barriers were identified that was allocated to 3 levels according to Llewellyn-Thomas' theoretical framework: intrapersonal, interpersonal and extrapersonal factors. Eight different suggestions were made to mitigate or remove these barriers.

2. Intrapersonal factors

The following were identified as intrapersonal barriers to help-seeking: low risk-assessment skills, excessive self-reliance, lack of belief in the effectiveness of the service and a general lack of openness to psychological help. To address these, interventions such as psychoeducation, wider promotion of the service and provision of online counselling have been proposed.

3. Interpersonal factors

The interpersonal barriers were: lack of information about services, fear of exposure and unfamiliarity with the counsellors and the process. To mitigate these, online counselling, psychoeducation, routine screening for psychological readiness and improvement of the information flow were also suggested.

4. Extrapersonal factors

Extrapersonal deterrents included: lack of insurance for mental health care (international students), limited counselling sessions, unfavourable sociocultural attitudes, and fear of stigmatisation. Respondents suggested that consideration should be given to extending insurance, increasing the number of counselling sessions, introducing routine screening and organising stigma reduction campaigns.

5. Attitudes towards online counselling

In total, 13 units of content analysis expressed positive attitudes towards online counselling among medical students while five reflected a negative attitude.

Students were of the opinion that text-based counselling can be effective in some cases and, if combined with anonymity, can increase the willingness to seek help. However, they consistently preferred video counselling to text-based

counselling. 10 units of content analysis argued in favour of video-based counselling, while 4 argued against it, in three of which lack of anonymity was the reason for rejection. The preference for text-based counselling was expressed in 4 units, mainly because of anonymity, while 8 units were in favour of rejection due to lack of non-verbal information and perceived lower effectiveness.

There were 13 content units showing a preference for online advice while a similar 13 units showed a preference for face-to-face advice.

4.3. Academic motivational profiles and their association with mental health among first-year medical students

1. Description of the sample

The sample consisted of 189 (response rate 29.9%) first-year medical students studying in Hungarian and English (mean age = 19.38 ± 2.03 years, 72% female. 59.3% of the students were Caucasian, 22.2% Asian, and 18.5% African.

2. Identifying academic motivational profiles using cluster analysis

We performed a two-step cluster analysis along the three main types of motivation for learning (intrinsic motivation, extrinsic motivation, amotivation), which resulted in three distinct clusters (motivational profiles). Cluster 1 ("High" self-determination", n=59 [31,2%]) had the highest mean level of extrinsic motivation (M=6.07, SD=0.41), followed by intrinsic motivation, also classified as high (M=5.48, SD=0.60) and low levels of amotivation (M=1.57, SD=0.95). For members of cluster 2 ("Moderate" self-determination, n=111 [58,7%]), the mean of intrinsic (M=4.50, SD=1.06) and extrinsic motivation (M=4.41, SD=0.87) showed similar and moderate levels, while the level of amotivation was low (M=1.25, SD=0.36). Cluster 3 ("Low" self-determination, n=19 [10,1%]) consisted of those with the highest factor mean of moderate levels of amotivation (M=4.22, SD=1.02), followed by moderate levels of extrinsic motivation (M=4.03, SD=1.16) and low intrinsic motivation (M=3.07, SD=1.30). There were no significant differences in the gender distribution of school motivation cluster profiles (Pearson's chi-square test, $\chi 2$ =3.72; p=0.156). One-sample t-test was used to compare the means of the factors within clusters, with the reference value of the test always being the higher factor value of the pair to be compared. Except for two

factor pairs, the means of all factors within each of the three clusters were significantly different from each other. The levels of intrinsic (M=4.5, SD=1.06) and extrinsic motivation (M=4.41, SD=0.87) were not significantly different (t[110]=0.964; p=0.337) in the "Moderately" self-determined cluster; similarly, the means for extrinsic motivation (M=4.03 SD=1.16) and amotivation (M=4.22, SD=1.02) were not different (t[18]=0.726, p=0.477) in the "Low" self-determined cluster. To clarify these results, we examined differences between subscales of extrinsic motivation. We found that the extrinsic motivation factor in the "Highly" and "Moderately" self-determined profiles was significantly dominated by the "Identified Regulation" subfactor, which is the closest extrinsic motivation subtype to intrinsic motivation on the SDT continuum. In the "Low" self-determined profile, the extrinsic motivation subscales show a medium level, with a non-significant dominance of the "external regulation" subscale, which is the extrinsic motivation subtype closest to amotivation. In terms of between-group differences, the means of all factors were significantly different across the three clusters, except for the level of extrinsic motivation between the "Low" and "Moderately" self-determined clusters.

3. Identifying academic motivational profiles using quantile computation

First, we created terciles, which were not appropriate for creating well-defined groups. Next we created deciles, first comparing the top 2 categories (deciles 9 and 10) with all others (deciles 1-8), which resulted in three (1.59%) students being both amotivated and intrinsically motivated, and 24.3% being both explicitly extrinsically and intrinsically motivated. Subsequently, only those in decile 10 were compared to those in deciles 1-9, resulting in none of the most amotivated students (those in decile 10 of amotivation) being included in the most intrinsically motivated (decile 10 of intrinsic motivation), and 14.3% of students being included in both extrinsically and intrinsically motivated. In the latter calculation, 9.5% of students were considered amotivated. There were no gender differences in any of the motivational types.

4. The relationship between academic motivational profiles and mental health

While the proportion at high risk of psychological morbidity (GHQ score >4) was similar in the "High" and "Moderate" self-determination" clusters (57.6% vs 59.5%), the proportion was significantly higher in the "Low" self-determination" cluster (94.7%).

The median of the psychological distress indicator was also significantly higher in the "Low" self-determination cluster compared to the "High" and "Moderate" self-determination clusters, but no significant difference was found between the latter two clusters.

Being in the "Low" self-determined profile was associated with significantly lower levels of life satisfaction compared to the "High" and "Moderately self-determined" profiles.

We also examined the relationship between mental health indicators and the types of motivation generated by quantile computation. Compared to students in deciles 1-9, the proportion of students with abnormal levels of psychological distress was not significantly higher for students in the intrinsically motivated and extrinsically motivated 10^{th} deciles. However, the proportion of students at high risk of pathological distress was significantly higher for those in the 10^{th} decile of amotivation compared to those in the 1^{st}-9^{th} deciles. There was also a significant difference in the medians of life satisfaction between the motivational types created by quantile analysis. Within this, those with the most intrinsic or most extrinsic types showed no difference in life satisfaction, but those with amotivated had significantly lower life satisfaction compared to the former. When comparing life satisfaction between those in the highest decile of the three motivational types and the rest of

the participants, no significant difference was found for intrinsic ($p=0.629$) and extrinsic ($p=0.321$) motivation, but for amotivation, those in the highest decile reported significantly lower life satisfaction compared to those in deciles 1-9 ($p<0.001$).

A significant negative correlation was found between intrinsic motivation and psychological distress ($p=0.006$), that is, higher levels of intrinsic motivation were associated with lower levels of distress. Significant positive correlation was found between levels of amotivation and pathological distress ($p<0.001$). No significant correlation was observed between levels of extrinsic motivation and levels of distress ($p=0.758$). Significant positive correlation was found between intrinsic motivation and standardised total score of life satisfaction ($p<0.001$). In contrast, significant negative correlation was found between amotivation and standardised total score of life satisfaction ($p<0.001$). No significant correlation was found between standardised total score of extrinsic motivation and life satisfaction ($p=0.080$).

4.4. Patterns of use of online psychological services

1. Pattern of visitors to the portal and use of self-help materials

Altogether 14.3% (n=183, 71.6% women) of the students the Hungarian-language medical course of the university and 16.1% (n=275, 58.9% women) of the students of the English-language course visited the website during one year (15 April 2020 - 15 April 2021). Among them, 53.6% of Hungarian students (n=98) and 50.5% of foreign students (n=139) did not show any further activity on the site, i.e. did not view any of the self-help materials. Most Hungarian students were from the first (18.6%) and fifth year (27.3%). 17.5% (n=32) were in slips due to one or more failed subjects. The majority of foreign students were from the first (24.4%) and third (20.7%) year groups. Of the international students, 19.3% (n=53) followed an individual study plan. There was no significant difference in the proportion of students following an individual curriculum between Hungarian and English courses (p=0.836). A significantly higher proportion of women entered the portal (p=0.006). A marginally significant difference was found between Hungarian and international students in terms of year group, with a higher proportion of international students from the first year group than Hungarian students (p=0.05).

28% fewer international students (37.7%, n=20) of those following an individual curriculum viewed at least one self-help content compared to those following the sample curriculum (52.3%, n=116) ($p = 0.058$). The number of materials viewed per visitor was also lower among them (Mdn=0, Q25-75: 0-1; recommended study plan: Mdn=1, Q25-Q75: 0-1.25; Mann-Whitney U=4900.50, $p=0.041$).

Preferences for self-help materials

36.6% of Hungarian medical students (n=67) and 40.4% of international medical students (n=111) viewed content aimed at improving learning skills ($p=0.614$), while 29% of Hungarians (n=53) and 23.4% of international students (n=64) viewed content related to stress management techniques, showing no significant difference between the two student populations ($p=0.491$). Significant group differences were already found in terms of access to COVID-19 related information materials ($p<0.001$). 24% of Hungarian students (n=44) opened at least one such content, compared to 9.5% of international students (n=26). In terms of the use of materials to improve learning skills, in both groups the presentation on effective learning techniques was the most popular, followed by materials on time management and note-taking and organising mobile apps. There was no significant difference between Hungarian and

international students in terms of viewing materials aimed at improving learning skills, and neither grade nor study plan (individual or sample curriculum) showed any correlation with interest in different content. However, in terms of gender, Hungarian females (11.5%, n=15) showed significantly more interest in note-taking and organisation aids than Hungarian males (1.9%, n=1) (p=0.040). This relationship was reversed in favour of males in the international group (13.3%, n=15; 4.9% females [n=8]; p=0.014).

In terms of the types of stress management materials, audio materials on relaxation were the most frequently opened. The highest interest among Hungarian students was shown towards very short (less than 2 minutes) relaxation audio materials (16.4%, n=30). The highest rate of viewing among the international student population was related to medium-length relaxation materials of the same content as the Hungarian materials, ranging from 5-15 minutes (13.5%, n=37), followed by video materials on deep breathing (6.2%, n=17). Neither grade nor type of study plan (individual or recommended study plan) was associated with preference for stress management materials in either group.

5. NOVEL FINDINGS

5.1. Factors negatively affecting the mental health of medical students and options for interventions

To our knowledge, this research is the first detailed qualitative study on the perspectives of students about the stressors associated with medical education along with potential interventions to address these stressors. One set of sources of stress identified by students can be defined as those that the university has the means to reduce or eliminate. These include specific features of the system of assessments that does not help or even hinder preparation, including unclear requirements, perceived subjectivity of examiners, perceived unfair assessments, shortcomings in study aids and practical training, and problems with the flow of information within the university. In terms of key interventions, students suggested more help for studying, and interventions aimed at improving learning techniques and time management skills to better deal with the large amount of material to be learned.

5.2. Barriers to psychological help-seeking among medical students and possible interventions to reduce them

A novel finding is the identification of difficulties in accessing mental health services for students from their perspective, and the hierarchical classification of barriers at the intrapersonal, interpersonal and extrapersonal levels as follows. Intrapersonal barriers included inadequate skills for risk assessment, excessive tendency on self-reliance, scepticism about the effectiveness of services, and lack of openness towards external help. Interpersonal factors included concern about long waiting lists, lack of information about available services, fear of exposure, and lack of knowledge about counsellors and the counselling process. Extrapersonal barriers included lack of health insurance (for foreign students), limited number of consultations, unfavourable socio-cultural attitudes, and fear of stigmatisation. We consider it a novel finding that medical students identified lack of knowledge about the process, effectiveness and availability of mental health services as the most important barrier to using services besides fear of stigma as a known limiting factor. Students highlighted a number of factors that could be addressed by the university such as

improving the dissemination of information about helping services, providing online video counselling in addition to face-to-face psychological counselling, and improvement of psychoeducation, the latter in the context of compulsory courses in order to be more effective. Consideration should be given to the routine compulsory screening of mental health.

5.3. Academic motivational profiles and their association with mental health among first-year medical students

A new result of this study was the development of two statistical methods for creating academic motivation profiles that cannot be found in the literature. One of the methods used two-step cluster analysis to estimate academic motivation as a construct based on self-determination theory that identified three distinct motivation profiles. 1. The "High" self-determination" profile indicates high levels of intrinsic and extrinsic motivation and low levels of amotivation; 2. Those belonging to the "Moderate" self-determination profile are characterized by moderate levels of intrinsic and extrinsic motivation and low levels of amotivation. 3. The „Low" self-determination group is characterised by relatively high levels of amotivation,

significantly higher than the other two clusters; and moderate levels of extrinsic and reduced intrinsic motivation. The other method applied quantiles to clearly separate the categories of intrinsically motivated and amotivated students. Using cluster analysis, 10% of the students were found to have low intrinsic motivation while 9.5% were found to be amotivated according to the quantile methodology, supporting the reliability of both methods.

The strong correlation between academic motivation profiles created by the new methods and indicators of mental health is also a novel finding. Low levels of amotivation or self-determination are associated with an increased risk of psychological distress and reduced levels of life satisfaction.

5.4. Patterns of use of online psychological services

We expanded our existing mental health service provided to students („Ariadne's thread") with self-help materials and adapted it entirely for online use at the beginning of the coronavirus epidemic. The patterns of use of the online services during one year revealed that even in the middle of the pandemic, students preferred materials helping them in their studies rather than self-help methods aimed at stress reduction

and professional interventions. Among self-help stress management techniques, medical students preferred the shortest, most conveniently usable relaxation materials. Contrary to the expected results, international students following an individual study plan due to one or more failed exams showed limited interest in using either self-help learning or stress management materials compared to students following a recommended study plan.

6. CONCLUSIONS

Our findings support the notion that the need of medical students for mental health support could be satisfied by a range of measures that can be implemented at the organisational level by the university. Priority should be given to providing greater systemic support to fulfil academic requirements by improving the quality of teaching and improving the flow of information. This would affect the largest number of students and, although such changes require considerable work, these would be the most effective. Widening the range of mental health services and improving access to them could also be implemented at the organisational level.

Our results provide a comprehensive picture of the barriers to the use of mental health services among medical students at the University of Debrecen along with a range of interventions that could be used to remove them from the students' perspective. Intrapersonal, interpersonal and extrapersonal factors play a significant role in the help-seeking behaviour of students that can be supported by several means implementable by the university as an organization since many of the barriers are extrapersonal originating at the institutional level. In addition to known factors such as fear of stigmatisation and difficulty in accepting problems, excessive self-reliance, insufficient skills for mental health risk assessment, and difficulties of applying appropriate coping mechanisms are all barriers to help-seeking among medical students. Lack of knowledge in the effectiveness of counselling and unfamiliarity with the service provider and the process of accessing service also hinder the uptake of mental help services.

Medical students are more receptive to counselling in video format, which can act as a gateway to subsequent face-to-face encounters and access to care. Thus, online counselling can help to reduce the gap between need and uptake of services. The results provide a basis for improving and redesigning mental health services.

Academic motivation, especially those types that reflect higher levels of autonomy are positively correlated with good academic outcomes. Therefore, the identification of motivational profiles of students is particularly important since it can provide estimates not only for psychological adjustment but also for self-efficacy, academic achievement and the risk of dropping out. Assessing academic motivation should optimally be carried out among teenagers – before they enter university – preferably in the context of career counselling that would help them identify the most appropriate career options.

Considering the wide range of online mental health interventions that we offered to medical students during the pandemic, it is worth noting that even with the adverse mental effects caused by the pandemic, students overwhelmingly selected interventions to improve learning techniques; and they preferred short audio-format relaxation techniques for stress management. The preference for help to improve study skills reflects the dominant impact of medical studies on students' mental health and the fact that desire to meet academic expectations is a primary source of stress. It follows that the provision of effective interventions to support learning should be a primary means to reduce stress among medical students. Further research is needed to establish evidence for this association that requires the implementation, monitoring and

evaluation of well-designed interventions for students that would individually assess the before-after mental state and academic performance of participants. However, such research should be carried out as randomised controlled trials with individual identification of participants which is difficult given the preference of anonymity among students.

Peer mentoring programmes operated by senior students as volunteers could also be designed to improve the study skills of students that would also facilitate the development of peer relations and integration into the community of medical students. However, the profile of self-determination (motivation) of the target population should be taken into account when designing services for students.

Any health promotion intervention is effective only if the target group considers it useful and is willing to get involved. Therefore, when designing, implementing and evaluating health promotion interventions for students, it is essential to take into account their perceptions of the factors affecting their mental health along with their preferred solutions. Of these, systemic changes are the most effective way of delivering health promotion interventions reaching the widest range of students but these are the most difficult to implement.

There is also a need for initiatives to target smaller groups of students that may take into account and develop their individual

characteristics and stress management skills. Preference should be given to initiatives that integrate skills development into the curriculum.

There is also a potential to identify the motivational profile and feed it back to individual students. However, this should be carried out before they make career choices and set their higher education goals. Further research would be needed to establish the usefulness of motivational profiles in predicting individual academic risks and in talent management programmes. Our newly developed method to assess academic motivation enables the use of the AMS scale in descriptive research, in development studies or in the evaluation of interventions.

The self-determination theory of motivation has become an eminently important concept in the field of positive psychology. The fathers of SDT, Ryan and Deci consider the theory as part of a „Copernican turn" in psychology which – in contrast to behaviouristic approaches – places the emphasis on people's inherent motivational propensities for learning and growing. Such propensities are indispensable for future doctors, along with their profound understanding that in addition to their professional competences, their mental health will be the greatest resource that must be continuously developed.

7. SUMMARY

We aimed to identify major sources of distress in medical education at University of Debrecen, including types of motivation for learning, and to identify appropriate organisational measures, including online psychological interventions, that would be most relevant to the needs of most students. First, we conducted focus group interviews and carried out qualitative content analyses. Second, academic motivation and mental health were assessed using a survey method and profiles of academic motivation were statistically constructed. The analysis of patterns of access to a collection of online mental help resources was based on the log data of the learning management system where a collection of self-help materials was available. A number of organisational and individual factors affecting the mental health were identified and can be addressed through systemic changes and interventions to be implemented by the university. Our results on academic motivation profiles provide a practical method for positioning medical students on the self-

determination continuum as being 'low', 'moderate' or 'high' and offer means to identify students struggling with motivation. The analysis of access to our expanded online mental health platform during one year of the pandemic highlighted the students' strong preference for study skills support over stress reduction interventions. These findings can be used either for the remodeling of existing or for the development of new interventions tailored to medical students.

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9. LIST OF PUBLICATIONS

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List of publications related to the dissertation

1. **Oláh, B.**, Münnich, Á., Kósa, K.: Identifying academic motivation profiles and their association with mental health in medical school.
   Medical Education Online. 28 (1), 1-13, 2023.
   DOI: http://dx.doi.org/10.1080/10872981.2023.2242597
   IF: 4.6 (2022)
2. **Oláh, B.**, Rádi, B. M., Kósa, K.: Barriers to Seeking Mental Help and Interventions to Remove Them in Medical School during the COVID-19 Pandemic: perspectives of Students.
   Int. J. Environ. Res. Public Health. 19 (13), 1-18, 2022.
   DOI: http://dx.doi.org/10.3390/ijerph19137662
   IF: 4.614 (2021)*
3. **Oláh, B.**, Kuritárné Szabó, I., Kósa, K.: Transfer of Mental Health Services for Medical Students to Cyberspace during the COVID-19 Pandemic: Service Use and Students' Preferences for Psychological Self-Help Techniques.
   Int. J. Environ. Res. Public Health. 19 (20), 1-10, 2022.
   DOI: http://dx.doi.org/10.3390/ijerph192013338
   IF: 4.614 (2021)*

List of other publications

4. Kovács-Tóth, B., **Oláh, B.**, Kuritárné Szabó, I., Fekete, Z.: Psychometric properties of the Adverse Childhood Experiences Questionnaire 10 item version (ACE-10) among Hungarian adolescents.
   Front. Psychol. 14, 1-11, 2023.
   DOI: http://dx.doi.org/10.3389/fpsyg.2023.1161620
   IF: 3.8 (2022)

* In the year of acceptance (2021) the journal has impact factor: 4,614.

5. **Oláh, B.**, Bíró, É., Kósa, K.: Residence in segregated settlements (colonies) rather than Roma identity increases the risk of unfavourable mental health in Hungarian adults.
Front. Public Health. 11, 1-9, 2023.
DOI: http://dx.doi.org/10.3389/fpubh.2023.1205504
IF: 5.2 (2022)

6. **Oláh, B.**, Fekete, Z., Kuritárné Szabó, I., Kovács-Tóth, B.: Validity and Reliability of the 10-Item Adverse Childhood Experiences Questionnaire (ACE-10) Among Adolescents in the Child Welfare System.
Front. Public Health. 11, 1-10, 2023.
DOI: http://dx.doi.org/10.3389/fpubh.2023.1258798
IF: 5.2 (2022)

7. Kovács-Tóth, B., **Oláh, B.**, Kuritárné Szabó, I., Túry, F.: Adverse childhood experiences increase the risk for eating disorders among adolescents.
Front. Psychol. 13, 1-10, 2022.
DOI: http://dx.doi.org/10.3389/fpsyg.2022.1063693
IF: 3.8

8. **Oláh, B.**, Rádi, B. M., Kósa, K.: Az orvostanhallgatók mentális egészségét kedvezőtlenül befolyásoló tényezők és a beavatkozások lehetséges pontjai hallgatói szemszögből.
Mentálhigiéné és Pszichoszomatika. 23 (3), 286-315, 2022.
DOI: http://dx.doi.org/10.1556/0406.23.2022.011

9. Fekete, Z., Vass, E., Balajthy, R., Tana, Ü., Nagy, A. C., **Oláh, B.**, Domján, N., Kuritárné Szabó, I.: Efficacy of metacognitive training on symptom severity, neurocognition and social cognition in patients with schizophrenia: a randomized controlled trial.
Scand. J. Psychol. 63 (4), 321-333, 2022.
DOI: http://dx.doi.org/10.1111/sjop.12811
IF: 2.1

10. Kovács-Tóth, B., **Oláh, B.**, Papp, G., Kuritárné Szabó, I.: Assessing adverse childhood experiences, social, emotional, and behavioral symptoms, and subjective health complaints among Hungarian adolescents.
Child Adolesc Psychiatry Ment Health. 15 (1), 1-12, 2021.
DOI: http://dx.doi.org/10.1186/s13034-021-00365-7
IF: 7.494

11. Kaszás, B., **Oláh, B.**, Kovács-Tóth, B.: Az izomdiszmorfia összefüggése a testképpel és a korai maladaptív sémákat kialakító szülői magatartással.
Psychiatr Hung. 36 (2), 113-123, 2021.

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12. Fekete, Z., Vass, E., Balajthy, R., Tana, Ü., Nagy, A. C., **Oláh, B.**, Kuritárné Szabó, I.: Basic demographic outcomes: additional findings of a single-blind, randomised, controlled trial on metacognitive training for psychosis.
Psychosis. 2021, 1-11, 2021.
DOI: http://dx.doi.org/10.1080/17522439.2021.1952296

13. Kovács-Tóth, B., **Oláh, B.**, Kuritárné Szabó, I.: Can the Cumulative Adverse Childhood Experiences (ACE) Score Actually Identify the Victims of Intrafamilial Childhood Maltreatment? Findings from a Study in the Child Welfare System.
Int. J. Environ. Res. Public Health. 18 (13), 1-13, 2021.
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