Hidden Roles of Students and Digital Health Applications in the Field of Mental Health: A Study Protocol for a Prospective Study on Hidden Social Roles with Focus on Informal Relatives, Mental Health, Sleep, and Digital Health Applications

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Abstract: Students take on various hidden roles in life - including as informal carers. Due to the multiple burdens, young carers often suffer from psychological problems that cannot be treated due to a lack of therapeutic resources. Germany was the first country worldwide to include digital health applications in its health insurance portfolio. In this research project, which is to be carried out as part of a doctorate, the aim is to use an online survey to record the level of knowledge and willingness to use digital health applications, to identify the social roles as well as the associated activities and their amount of time, and to identify the mental health status of students to query. A digital health application for insomnia should be tested, as insomnia is a common accompanying symptom of psychological problems. It is expected that the level of knowledge about digital health applications is low, but there is a willingness to use them. It is also expected that a significant proportion of students are young carers. The digital health application against insomnia is expected to improve the sleep of many students. This doctorate is intended to give the included elements more visibility. The study is registered retrospectively.

1 INTRODUCTION

The living conditions of the 21st century present people with new challenges. The digital age is leading to a change in user behaviour in society and its spheres of influence. Science and technology are shaped by digitalisation. Politics and business must deal with new issues. Demographic change is changing the structure of Germany. Society must adapt. The ever-increasing pressure to perform is characterising the younger generations - especially in terms of mental health.

The young generation is growing up in a volatile time. Events and circumstances such as the coronavirus pandemic, climate change, wars and inflation have a formative influence. Added to this are other factors such as high pressure to perform, financial worries, limiting illnesses, private conflicts, or responsibility towards others (Meyer et al., 2023). The latter particularly affects students who work as unpaid carers - so-called young carers. According to

the BARMER Care Report, around 6 million people in Germany will need care by 2030. The Federal Statistical Office of Germany forecasts similar figures. Half of these are expected to be cared for exclusively by family carers at home. The need for care is increasing. This is due not only to demographic ageing, but also to better access to healthcare and the range of services on offer (Rothgang & Müller, 2021; Federal Statistical Office, 2023).

In the 22nd Social Survey of Students in Germany, just under 12 per cent of the students surveyed stated that they were carers (Kroher et al., 2023). An online survey by the Hamburg University of Applied Sciences found that around 15 per cent of students are informal carers (Mindermann et al., 2021). An online survey conducted by Bremen University of Applied Sciences produced similar results. Here, it was also 15 per cent of the students surveyed. They were also involved in caring activities for an average of 19.86 hours per week (Dörmann et

al., 2023). This corresponds to almost the maximum number of hours per week permitted for students during the lecture period in Germany (Bundesagentur für Arbeit, 2023).

Time resources are severely limited due to the intensive care work and the multiple burdens mean that the course of study is discontinuous. Affected students are more likely to fail exams, social contacts are reduced, and many feel lonely and overwhelmed. They suffer from feelings of shame, financial problems, fear of the future and emotional stress (Dörmann et al., 2023; Haugland et al., 2022; Knobloch et al., 2022; Wazinski et al., 2022). Exhaustion, worries, and fears lead to chronic stress, which in turn can have far-reaching consequences for the person affected (Wazinski et al., 2022).

Stress results in physical and psychological symptoms that can develop into manifest illnesses. The stress leads to restrictions in daily life and quality of life. Not only the individual themselves, but also their environment is affected. This includes not only social contacts, family, and friends, but also the working environment and, more broadly, social structures. This becomes clear in the example of students who are also family carers. Conflicts within the family and challenging study situations favour the symptoms of stress. Young carers find it difficult to prioritise their tasks and obligations because they have a strong sense of obligation towards both their relatives and their studies. The consequence: tasks come to a standstill. The reasons are not visible to third parties. Young carers lead "hidden lives". Their obligatory social role remains hidden (Knobloch et al., 2022).

Many develop mental health problems as a result, but these are easily treatable, especially if they are recognised early and intervention is swift. Early treatment is crucial to the success of therapy (Klosterkötter & Maier, 2003). Symptoms are alleviated, quality of life improves, and the affected person can once again participate in social life. However, more and more resources will be needed in the coming years to cover the need for therapy, but these are limited (Jacobi et al., 2014; Mack et al., 2014). The number of people with mental health problems and sleep disorders is increasing. Students are also affected (Hildebrandt et al., 2023; Meyer et al., 2023).

The goals of classic somatic or psychotherapeutic treatment vary depending on the clinical picture, but they have the alleviation of symptoms in common. The service provider assumes the main responsibility and guides the patient through the treatment. However, to ensure long-term therapeutic success, it is essential to involve the patient and evaluate all possible measures. The combination of various interventions can be advantageous for complex disease patterns. A good doctor-patient relationship is essential for this (André Posenau, 2021).

In Germany, there are long waiting times for psychotherapeutic measures due to a lack of resources (Mack et al., 2014). In the long term, this can lead to a worsening of symptoms for those affected. One solution to this problem could be digital health applications. Digital health applications are prescription-only medical devices of a low-risk class that have a medical benefit and are tested by the Federal Institute for Drugs and Medical Devices for their positive proof of supply (Bundesinstitut für Arzneimittel und Medizinprodukte [BfArM], 2023). They are listed for various diseases according to the ICD classification in the digital health application directory and thus represent an additional supportive treatment method (Bundesinstitut für Arzneimittel und Medizinprodukte [BfArM], 2020). Digital health applications promote patient participation and strengthen the personal sense of responsibility for one's own health.

There is a change in awareness through active participation in treatment. Patients also have free access to their health data. Furthermore, the continuous generation of data makes it easier to understand, plan and adjust the course of illness as required. At the same time, emerging illnesses can be recognised and treated at an early stage. In addition, the doctor-patient relationship is improved by the reflective exchange between both parties (André Posenau, 2021; Gregor Hohenberg, 2021).

Various studies confirm the efficacy and thus the medical benefits of digital health applications in mental health and sleep (Berger et al, 2017; Heber et al, 2016; Klein et al, 2016; Lorenz et al, 2019; Meyer et al, 2015; Moritz et al, 2012; Twomey et al, 2020). However, service providers criticise the available evidence because of the rapid approval process. In addition, digital health applications are less well known among healthcare providers and patients than traditional treatment methods due to a lack of information (Dahlhausen et al., 2021; Radic et al., 2021; Stiftung Gesundheit, 2022).

Although the effectiveness of digital health applications has been proven, they are not well known among the population. Digital treatment approaches can support patient care in the future and contribute to better healthcare. The planned study therefore aims to record the level of knowledge and willingness to use digital health applications and at the same time the mental health status and sleep of students via an

online survey. The "hidden lives" of the students are also to be determined and quantified. In addition, a digital health application is to be tested via the Hamm Telemedicine Centre once the initial findings have been obtained. The digital health application is intended to improve sleep disorders. A good night's sleep has a positive effect on mental health (Roberts & Duong, 2014).

Students take on many social roles with different levels of performance. Young carers, who are active as family carers, play an important role here. In view of demographic change and social developments, it is necessary to pay more attention to the burdens and concerns of students and to categorise them socially. Research plays an important part in understanding and recognising the relevance of mental health and sleep in this context. The current study situation for these possible connections is limited. The aim of this research project is on the one hand to create more visibility in the form of quantitative and qualitative data for these topics and on the other hand to test digital health applications for their qualities.

The schematic illustration of the problem formulation is shown in Figure 1.
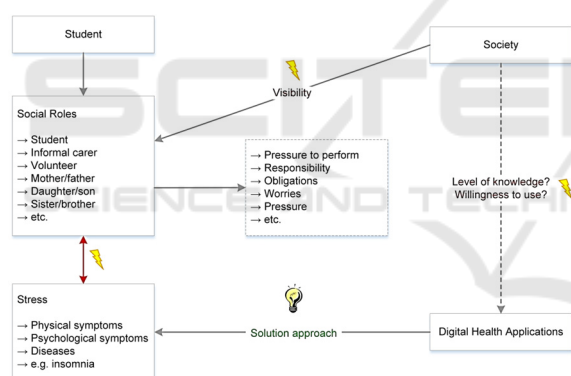

Figure 1: Schematic representation of the problem formulation.

This study protocol for a prospective study on the social roles of students and digital health applications in the field of mental health is to be conducted as part of a doctorate.

2 METHODS

The study design provides for an online survey as the data collection method. The data is collected via non-probability sampling at Hamm-Lippstadt University of Applied Sciences and Witten Herdecke University. All students are invited to participate. The online survey is anonymous and available in German and English. No prior knowledge or specific skills are required.

The data analysis provides for both quantitative and qualitative analyses and will work according to the mixed methods approach. The study includes questions in the areas of role theory and role distribution, digital health applications, mental health, sleep, and socio-demographics and is based on the Copenhagen Psychosocial Questionnaire to be able to adequately assess aspects such as emotional exhaustion. The aim of the survey is to record the level of knowledge about digital health applications and the willingness to use digital health applications. In addition, the mental health status and sleep of the students are to be documented. Furthermore, the social roles of the students are to be determined and quantified to draw conclusions about possible correlations. Multiple choice questions and Likert scales are used for this purpose. In optional free fields, participants can list further aspects if these are not given in the selection options.

Descriptive statistics are carried out on the individual topics. Subgroup analyses are then runned in relation to the socio-demographic characteristics of the participants. Finally, correlation calculations are carried out to show connections between the elements discussed. The qualitative data will be reviewed and analyzed. The study results are processed, evaluated, and visualized using the survey provider's online program and the statistical and analysis software IBM® SPSS Statistics from the technology company IBM. If required, the spreadsheet programme Excel 365 from Microsoft can also be used.

As this is a study protocol, the choice of method is not yet final and will be adapted to new circumstances if necessary.

3 DISCUSSION

Digital health applications represent an innovative, evidence-based intervention for various clinical pictures that can be used at different health levels. The low-threshold therapy offers many advantages, such as strengthening patient participation, saving time and financial resources, or closing gaps in care. Despite the various benefits, digital health applications have not yet been used much in practice because, on the one hand, awareness of them is too low and, on the other, service providers are not convinced of the effectiveness of these digital interventions.

Students are under immense stress for various reasons. Informal carers - the young carers - are particularly in focus due to the additional burden. The

social visibility of this problem is low. Statistics show that there is a great need for support services among students and that demand is increasing. Digital health applications are a possible solution to meet this need.

The study is intended to record the status quo of this topic in a defined sample and contribute new results to the study situation. No to little knowledge, but a positive willingness to use digital health applications is expected. This expectation is based on the novelty of digital interventions and the limited knowledge of service providers in this area. Service providers are essential for establishing new measures. It is also expected that many of the students will take on several social roles in their lives - many of them as young carers. Accordingly, it is assumed that the resulting stress and pressure has a negative impact on mental health and sleep and that there is a need for action in this area. This need is underpinned by various studies that address the rise in mental health problems.

Various stakeholders will benefit from this research. Students are encouraged in dealing with their own health and informed about additional treatment options. They also have the opportunity to draw attention to their mental health. In addition, the visibility of their social roles in society is increased. Many people are not aware of what other obligations and tasks students have outside of their studies. Hamm-Lippstadt University of Applied Sciences and Witten/Herdecke University can strive for health-promoting measures to improve the well-being of students in everyday university life. The provider of the digital health application receives information about the effectiveness of its application and direct feedback about the needs and opinions of users. The Federal Ministry of Health will also gain an impression of the spread and acceptance of digital health applications among the population. Based on the results, other measures for implementation in standard care can be considered if necessary. Furthermore, the expert association and economic players receive additional information and current evidence on the topic.

On the one hand, the results of the study contribute to important aspects in the research area of hidden lives and the associated mental health status and sleep and, on the other hand, provide findings in the research area of digital health applications regarding acceptance and willingness to use them. Based on the collected data, further research can aim to conduct comparative research - for example regarding socio-demographic characteristics. With regard to study programs, medical and psychology students could be asked about the educational

offerings in the field of digital medicine. Future healthcare providers are essential for establishing new measures, but they need to be sufficiently informed to do so. In terms of the acceptance and willingness to use digital health applications, it may be useful to ask for background information to draw attention to hurdles in the implementation of measures in standard care.

4 CONCLUSIONS

The data collected is intended to provide an overview of the topics of hidden lives, mental health, sleep, and digital health applications to increase visibility with both quantitative and qualitative data. Students are not only students, but are involved in many social structures, which creates a lot of pressure and stress that can be at the expense of mental health and sleep. The need for information on digital health applications and health measures in relation to mental health and sleep needs to be identified. Furthermore, the effectiveness of the digital health application should be clarified, and future interventions should be further developed with the feedback of the students.

Even if it is expected that digital health applications are largely unknown, it can be assumed that students are willing to use them. Due to the many social roles, it is assumed that the level of stress and pressure is very high and that there is a need for help. Mental problems are often accompanied by insomnia.

This work makes an important contribution to closing the research gap around hidden lives and their links as well as the research gap in the area of digital health applications in terms of acceptance and willingness to use.

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