The psychosocial wellbeing among veterinary students: an international perspective

A survey-based comparative study

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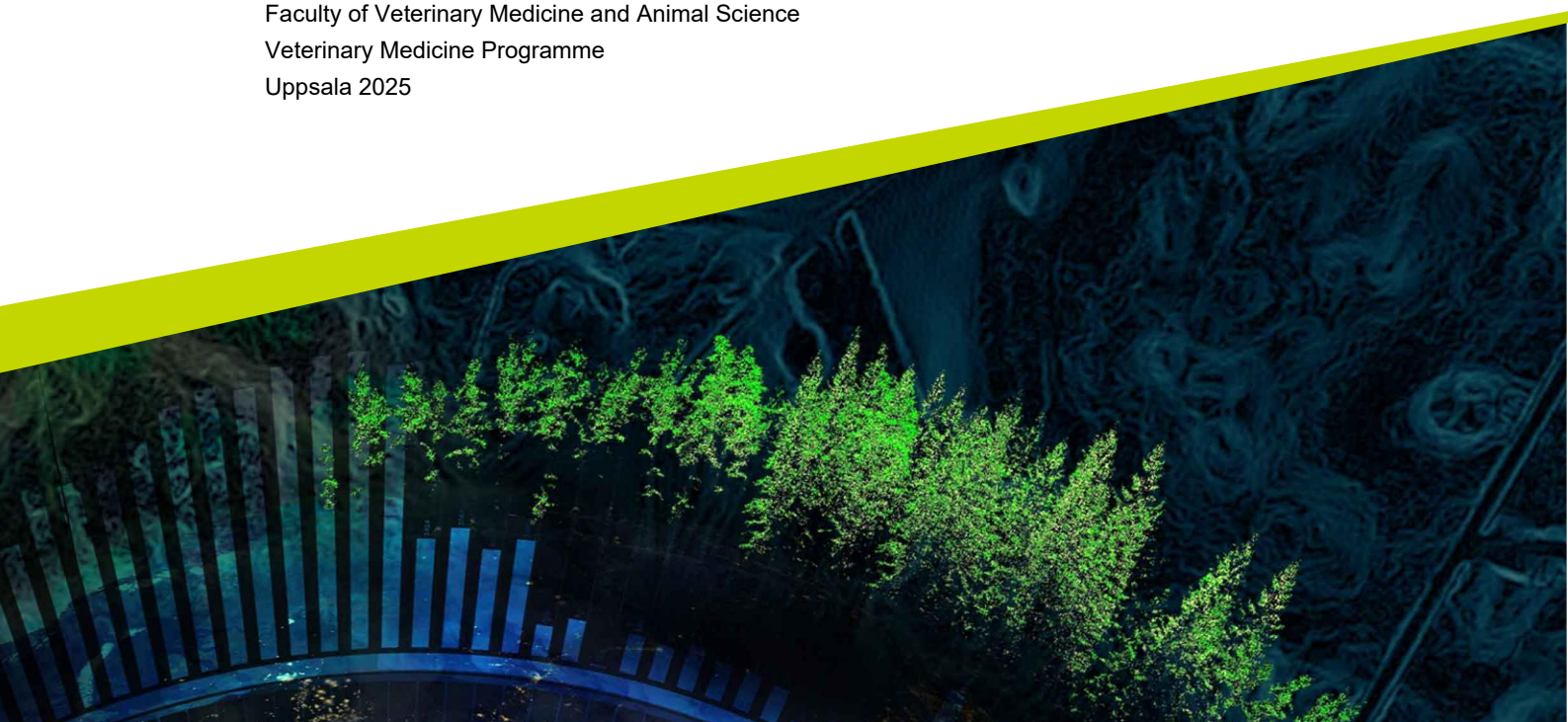

The psychosocial wellbeing among veterinary students: an international perspective - A survey-based comparative study

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Abstract

There is widespread research regarding the mental health struggles of veterinary professionals, which has been shown to be more severe than within other occupations. In recent years, the focus has moved to include veterinary students who also report higher levels of low psychosocial wellbeing than the general population. This descriptive and analytical study aims to investigate two questions: What is the current psychosocial wellbeing of veterinary medicine students in Sweden, Norway, Finland, Denmark, the UK and Australia? And how do these selected countries differ in their students' mental health status? A multiple choice survey based around eleven dimensions was distributed to third-sixth year students, and the results were compared in two different ways. The responses from 239 veterinary medicine students from five countries were analysed. Firstly, to answer the first aim, the average across all participants dimension scores were compared to reference values for the general Australian working population. Secondly, the individual countries' average dimension scores were compared to the average across countries score, and to each other within the same dimension.

The results of the survey were in line with the existing literature regarding the subject. As one group, the participating veterinary students reported scores less desirable than the reference in eight of the eleven dimensions. Only one dimension had a more desirable than reference score for the survey participants, this was sleeping trouble, and two dimension scores were comparable to the references. The dimension with the least desirable result, indicating the lowest level of psychosocial wellbeing, was cognitive stress. When comparing the average across all participants to reference scores for the Swedish occupational group "other healthcare professionals", burnout was the dimension with the most troubling result.

When comparing the respective countries dimension scores, differences were observed in the level of psychosocial wellbeing. The country with the greatest number of dimensions scored more desirable than the average across countries was Finland, followed by Norway. Thirdly was Australia, followed by Sweden. The least number of dimension scores more desirable than the average and the greatest number of dimension scores less desirable than average was found among the UK participants. Academic factors were most frequently reported as having a negative effect on the responder's current mental wellbeing in all countries except for Finland, where transitional factors were reported as having a more profound effect.

Keywords: psychosocial wellbeing, mental health, stress, veterinary medicine students, COPSOQ III

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Abbreviations

Abbreviation:	*Description:*
COPSOQ III	Copenhagen Psychosocial Questionnaire III
IVSA	International Veterinary Student Association

1. Introduction

The mental health and wellbeing of veterinarians has been a point of concern for many years. Compared to the general population, the rates of depression and suicide risk has been reported as higher amongst veterinarians in multiple countries (Nett et al. 2015; Fink-Miller & Nestler 2018; Schwerdtfeger et al. 2020). The risk has also been described as higher among veterinary professionals compared to medical practitioners and dentists (Bartram & Baldwin 2010). Research has additionally investigated the significance of age and gender in veterinarians in relation to these struggles, and many studies suggest that younger females are at greater risk of developing suicidal thoughts, mental health difficulties and job dissatisfaction (Platt et al. 2012). A Norwegian study however indicated that the highest suicide rates amongst veterinarians were found among male veterinarians (Dalum et al. 2024).

While much of the literature regarding mental health in veterinary medicine focus on the wellbeing of veterinary professionals, some studies have indicated that mental health problems may be pronounced already in veterinary students. For example, Wells et al. (2021) showed an alarming prevalence of depression, stress, anxiety and burnout not only amongst veterinarians, but also veterinary students. Many other studies have also indicated that the psychosocial wellbeing of veterinary students is alarmingly low (eg. Reisbig et al. 2012; Killinger et al. 2017; Nahar et al. 2019).

When it comes to the potential underlying causes for the alarming trend of poor mental health among veterinary students, several stressors have been found to be common for veterinary students. Liu & van Gelderen (2020) composed four main areas of stressors for Australian veterinary students: Academic (e.g., large workload, difficult content, faculty expectations, competition), transitional (e.g., moving from secondary education/to clinical years, transport, financial difficulties, social interactions), external relationships (e.g. family illness/death, partner/marriage relationship difficulties) and veterinary-related (e.g., long working hours, ethical dilemmas, difficult animal–client interactions, euthanasia).

Naturally, the mental health of any person is a complex matter with many factors integrating to result in the person's current mental wellbeing. While there is currently some literature describing the mental health of veterinary students in different countries, it is not known how recent data compare between countries. Thus, this study aims to investigate two main aspects of the mental wellbeing of veterinary students. Firstly - what is the current psychosocial wellbeing of veterinary students from Sweden, Denmark, Finland, Norway, the UK and Australia as a group compared to the general population? Secondly, how do the results from this survey compare not only to existing data but also between the participating countries?

The results of this study are intended to shed light on the current psychosocial wellbeing of veterinary students from an international perspective. This information may be used as an inspiration for potential revisions of the contents and structure of the veterinary program in the studied countries Sweden, Norway, Finland, Denmark, the UK and Australia.

2. Literature review

2.1 Veterinarians

To understand the mental health and wellbeing of veterinary students, it is important to also understand the environment of the profession they are heading towards. Working as a veterinarian can mean many different things, as it is a very broad profession. As described by the American Veterinary Medical Association (n.d.):

> "Today's veterinarians are the only doctors educated to protect the health of both animals and people. They work hard to address the health and welfare needs of every species of animal. Veterinarians also play critical roles in environmental protection, research, food safety, and public health."

Physical risks that are relevant to most veterinarians include anaesthesia and waste gases, X-rays / ionizing radiation, medications, cleaning agents and other chemicals, accidents (bites, falls, needle sticks), infections from bites or scratches, animal-transmitted diseases and parasites, heavy lifting and physical strain (OTIS 2023).

While these physical risks can cause injury and harm to veterinarians, it is more so the mental health of veterinarians in many countries which has been a growing area of concern. Several studies have been done on the prevalence and potential causes for increased depression, anxiety and suicide rates amongst veterinarians compared to other occupational groups and the general population (Bartram & Baldwin 2010; Platt et al. 2010; Hatch et al. 2011; Nett et al. 2015).

It is however important to note that despite the previously mentioned worrying trends in veterinary medicine, it has in the literature been recognised that many veterinarians are flourishing in their work. Many veterinary professionals are resilient people who thrive in their profession despite heavy physical and emotional demands, and long hours (Bartram & Boniwell 2007; Mastenbroek 2017). Work related well-being in the veterinary medicine field is an area not as explored as the negative sides of the profession (Wallace 2019). The majority of the "mental health" research focuses on the "mental distress", with one study showing that problem oriented mental health terms are used twice as often compared to well-being-oriented terms. The study also found that there were roughly twice as many articles regarding the negative aspects of the mental health amongst veterinarians compared to the positive aspects (Cake et al. 2017). This focus on the challenges of the veterinary profession might incorrectly disregard the wellbeing also noted for many veterinarians.

The question of what is causing the high prevalence of depression, anxiety and suicide risk within the veterinary occupation is complex. There are some known

risks for suicide which relate to the general population, such as mental disorders, substance abuse and experiencing negative life events (Dalum et al. 2024). When looking at additional risk factors for the veterinary profession, several risk factors have been described. They include job stressors such as long working hours and high work pace, specific personality traits common in veterinarians such as perfectionism, access to lethal medications and unique and challenging work experiences such as euthanasia (Fink-Miller & Nestler 2018). One article by Rohlf et al. (2022) mentions potential causes of compassion fatigue, which in turn can lead to burnout and/or depression. Compassion fatigue is defined by the charity Not One More Vet (n.d.), based on Bos (2022):

> "Compassion fatigue is a state of mental and physical distress that occurs when caregivers are chronically exposed to the suffering of others. Symptoms of compassion fatigue vary and might include exhaustion, frustration, depression, apathy, headaches, gastrointestinal distress, sleep disturbances, intrusive imagery, and fear. These negative effects worsen over time if the underlying cause is not addressed."

The causes mentioned by Rohlf et al. (2022) are exposure to animal suffering, participation in euthanasia, emotionally charged interactions with clients, long work hours and high workloads. Compassion fatigue is also a central part of a study by Dow et al. (2019), who investigated the impact of dealing with bereaved clients on the psychological wellbeing of veterinarians. In this study many of the participants were experiencing high to very high levels of compassion fatigue, especially the younger and female veterinarians. None of the 105 participating Australian veterinarians reported having sought out professional mental health or psychological help, neither for themselves nor as a referral for a grieving client. Almost 40% of the veterinarians reported that dealing with clients grieving the loss of a companion animal was directly affecting their own mental health (Dow et al. 2019). Rohlf et al. (2022) highlights an interesting fact regarding the veterinarian's reaction to participating in euthanasia. The author describes how the direct exposure to euthanasia (for example by giving injections or restraining the animal) was not associated with an increased risk of secondary traumatic stress (STS), however the indirect exposure to the process of euthanasia did predict this outcome. This is discussed and suggestions include that the participation in a euthanasia could give the veterinarian a form of closure which alongside talking to the pet owner and colleagues acts like a protective factor against STS. On the other hand, a veterinarian who is simply made aware that a euthanasia is taking place in their proximity but not participating is not subjected to these protective factors.

A key aspect behind the increasing demands on veterinary professionals is the evolution of the role of companion animals in society (Hart 2014). The affectionate bonds between human and animal and advancement of medicine has led to an increased demand from owners on the veterinarian. The expectation is for the

veterinarian to be dedicated and compassionate, while being both capable and responsible for the animal by alleviating pain and suffering. High demands like these are not unlikely to put pressure on the veterinarian and thereby have a negative effect on their mental wellbeing.

The link between mental health and empathy has also been described by Laura et al. (2024). The specific nature of the veterinary profession often includes stressors such as dealing with negative outcomes and communicating these to the owners, heavy workloads, long working hours and euthanasia. When these stressors come together, they can lead to a psychological stress for the veterinary professional, including but not limited to depression, anxiety, burnout and - in severe cases - suicide.

Another highly relevant factor potentially causing stress for both client and veterinarian, is the financial aspect of the profession. In an article from 2023 by Rhizoxin, many pet owners reported a stress regarding paying for veterinary care and an unpreparedness for a potential medical emergency for their pet. In addition, financially stressed people are reported as angrier than financially sound individuals. This anger is often taken out on the veterinary professional providing the care, which can result in a decline in mental health for the veterinarian.

The finance aspect from the veterinarian's perspective was explored in a survey from 2017 with 1,122 small animal veterinarians in the US and Canada (Kipperman et al. 2017). The survey reported that 57% or veterinarians felt that economic limitations affected their ability to provide the desired care to their patients, on a daily basis. 49% of participants reported experiencing moderate to severe levels of burnout, and many of them listed client financial limitations as a substantial contributing factor to their burnout. Most of the participants agreed that improved client awareness of pet insurance and veterinary costs would positively affect patient care as well as both client and veterinarian satisfaction.

The significance of gender and age in the discussion about mental health and risk for suicide and depression has been discussed in the literature. In a British study (Bartram & Baldwin 2010), the following was reported: Male veterinarians aged 45-64 years had a relative risk (RR) of 5.6 for committing suicide compared to the general population. This RR is also higher than that of male medical practitioners (RR=2.22), pharmacists (RR= 4.15), and dentists (RR 5.19). However, it was the female veterinarians who reported having the highest relative risk of committing suicide, with an RR of 7.62 compared to the general population. This is also significantly higher than that of female medical practitioners, who report a RR of 4.54. The claim that young female veterinarians experience poorer mental health than their older male colleagues is supported by a study on US veterinarians in 2022 (Volk 2022). A Norwegian study by Dalum et al. (2024) also investigated the connection between gender and suicide rate within health care professionals. While this study did not have enough participating female

veterinarians to estimate a suicide rate over time, the suicide rates among male veterinarians could be estimated and was reported as increased between the years 1980 and 2021. These results are supported by an Austrian study from 2023 which reports elevated rates of suicide for veterinarians of both genders (Zimmermann et al. 2023).

While discussing the risk factors for poor mental health among veterinarians, it is of relevance to also discuss protecting factors and coping methods. In a 2016 article by Hartnack et al., veterinary coping methods regarding performing euthanasia was explored. As with mental health in general, a strong social support system is proven to have a positive influence on mental health when used as a coping method by veterinarians dealing with workplace stress such as euthanasia. Most participants in the study reported debriefing with colleagues as their primary coping strategy, followed by talking to friends and family. Focusing on the benefit of euthanasia for the animal and accepting and expressing the grief instead of fighting against it were other strategies mentioned. On the other hand, some participants reported detachment and disengagement from the experience, animal and/or client as a coping strategy.

Coping strategies among veterinarians was also discussed in a qualitative Australian article from 2021 (Whitnall & Simmonds 2021). The author mentioned the following coping strategies to workplace stress among the 12 participating small animal veterinarians: practicing mindfulness by bringing awareness to everyday activities and positive self-talk when doubting oneself. However, the most commonly described coping method by the participants was either transitioning part of their working life to non-clinical work or reducing the number of working hours in a clinical setting. Many reported that working full time as a clinician while managing work stress was not possible for them.

The observation that veterinarians had a proportionally higher mortality rate for suicide compared to that of the general population was made as early as 1980 in the USA (Blair & Hayes Jr. 1980). Since then, studies have proven this to be consistent until present time. This includes studies and articles from many Western countries such as Sweden (Hagevi et al. 2024), Australia (Jones-Fairnie et al. 2008; Hatch et al. 2011), Norway (Hem et al. 2005; Dalum et al. 2024), Canada (Champagne 2018) and the UK (Mellanby 2005; Bartram & Baldwin 2010). However, Denmark (Hawton et al. 2011) and New Zealand (Skegg et al. 2010) have had contradicting results.

In Denmark 2011, Hawton et al. used data from national registers between the years 1981-2006, to examine the risk for suicide within medical occupation compared to teaching and the general population. The study found a significantly elevated suicide risk for nurses (Suicide rate ratio= 1.90), physicians (Suicide rate ratio= 1.87), dentists (Suicide rate ratio= 2.10) and pharmacists (Suicide rate ratio= 1.91) compared to teachers, but no elevated risk for veterinary surgeons

during the years examined. To put these numbers in perspective, the suicide rate ratio for teachers was set to 1 and for the rest of the population 1.25 (Hawton et al. 2011). In New Zealand, Skegg et al. (2010) examined suicide by identified occupational groups over the years 1973-2004. Veterinarians along with doctors and farmers were found to have similar suicide rates as the general national population. Male veterinarians were reported having a lower suicide rate compared to the general public. The authors do however mention that the veterinary sample was low in this study, with a low significance and wide confidence interval encouraging readers taking caution when interpreting the data.

A recent study by Hagevi et al. (2024) investigated the psychological wellbeing within the veterinary profession in Sweden. The main cause of the development of poor wellbeing was found to be the effects of negative experiences from client interactions. It was however noted that poor wellbeing may increase the risk of the veterinarian perceiving client interactions as negative or difficult. Thus, the author suggest that more research should be encouraged in this area to discover the causality for developing and maintaining poor wellbeing.

Looking at Australia, one study (Jones-Fairnie et al. 2008) investigated the cause of death amongst Western Australian (WA) and Victorian veterinarians (VIC) respectively, between the years 1990 and 2002. The results were an estimated suicide rate of 4.0 and 3.8 times the standardised suicide rate for adults in the WA and VIC populations.

When interviewing 701 US veterinary professionals, one study (Skipper & Williams 2012) reported 66% of participating veterinarians as clinically depressed, and 24% reported that they had contemplated committing suicide since beginning their veterinary education.

In 2003, a questionnaire regarding work environment and occupational health was distributed to all working veterinarians under 65 years old in Finland (Reijula et al. 2003). The study reported an elevated risk of accidental physical harm especially for those working in with horses, production animals or mixed practice (both large and small animals). Regarding work related stress and fatigue, the prevalence was highest among those working in urban areas or in the field of education and research. Severe work-related exhaustion was reported most frequently by younger women and older men. Altogether, less than 5% of the 785 participants reported their health as poor.

While comparing statistics regarding veterinary professionals to those of the general population, it is also relevant to compare with similar occupational groups, such as medical practitioners and dentists. When investigating the mortality from suicide in male and female veterinarians, medical practitioners and dental practitioners aged 20-74 years in England and Wales in the periods 1979-1980, 1982-1990 and 1991-2000 the following was reported: Both male and female veterinarians had significantly higher proportional mortality ratio from

suicide compared to the other occupational groups (Mellanby 2005). Similarly, a more recent study regarding veterinary surgeons in the UK revealed that this group reported a suicide rate double that of other health care workers, and four times higher compared to the general population (Bartram & Baldwin 2010).

To summarize, the literature has for many years shown alarming rates of depression and suicide among veterinarians compared to the general population.

Several suggestions have been made in the literature regarding what should be done to improve the mental health and wellbeing of veterinarians. While some aspects of the issue at hand are the responsibility of the employers and directly linked to the professional work life and everyday life of a veterinarian, such as long working hours and the complex emotions related to euthanasia, it is important to emphasize the importance of the veterinary education and training as well as the transition between the role of student to veterinary professional. It goes without saying that the mental health of a veterinary student is something the individual carries with them into their professional life, and highly influences the mental health of the future veterinarian. Hence, the experiences from veterinary school and the wellbeing of the student are crucial components in the future veterinarian's wellbeing.

2.2 Veterinary students

Based on the previous chapter regarding veterinary professionals, it has naturally been relevant to also investigate the mental health of veterinary students. For example, two American studies have found the following alarming data:

- 22.6% of veterinary students screened positive for depression, and 52.3% for general anxiety (Nahar et al. 2019)
- 49-69% of veterinary students reported at or above clinical depression levels (Reisbig et al. 2012)

With the worrying above mentioned prevalence estimates in mind, the question of cause is natural to occur. The theme of belongingness was central in a study made by Cardwell & Lewis (2017) who explored "the UK's veterinary students' perceptions and expectations of university life", and considered "how these might affect well-being". Belongingness is a need to all humans, and the absence of it can severely affect health and wellbeing (Baumeister & Leary 1995), which features as an element in the Model of suicidal behaviour by O'Connor (2011). Cardwell & Lewis (2017) suggest that the need to find belongingness within the veterinary profession is acute among veterinary students, who have invested much of their time and efforts just to get accepted into veterinary school. Classmates will eventually turn into colleagues and professional peers, which means that an unsatisfactory experience of belongingness as a veterinary student may lead to long lasting effects of the veterinarian's mental health and wellbeing. The authors mean that the veterinary profession because of this has a responsibility to contri-

bute to the encouragement of a sense of belonging among students and trainees. The study clearly showed that the students who felt supported by their peers and welcomed into the profession, felt inspired and empowered in their work. On the other hand, there were also students who felt distanced from the profession by the attitude from their senior colleagues.

Work-life balance is another one of the expectations explored in the same study, which is not specific to only veterinary students yet still of heightened relevance (Cardwell & Lewis 2017). The participants of the study suggested that there might be a tendency among them to accept a pronounced lack of work-life balance. Having worked hard to secure a place in veterinary school and continuing to be successful in their education, the students are used to a high intensity of effort and are challenged to find a balance having already gotten into an unbalanced pattern of working behaviour.

In a 2024 survey distributed by the local student union representatives regarding the psychosocial wellbeing of Swedish veterinary medicine and veterinary nursing students, 16.6% of all responders reported bad general health and 40.5% reported bad general health part of the time (SLUSS 2024). 14.3% reported having good health throughout their education. 60.6% of the participants reported that their psychosocial wellbeing had worsened since starting their studies, and among those who had started their clinical part of their program 24% reported that the clinical part was the cause of their drastically declined health. When looking at stress, 48.2% of participants reported experiencing high or extremely high levels of stress. Only one person out of the 259 students reported experiencing no stress. When asked if the major cause of stress was the education itself, 61.8% answered yes and 28.6% answered a 50/50 cause between the education and other factors. The survey listed 32 specific potential causes of stress, and the following got the most votes (translated from Swedish to English):

1. To finish a course with an exam and starting a new course the day after - no recovery time (74.5% agreed)
2. That I don´t have the energy to spend time on other things I enjoy - like student union activity, exercise, friends, animals (63.3% agreed)
3. A worry that I won´t have the knowledge and skills which will be expected when the education finishes (62.5% agreed)

Other research has shown that when compared to the general population, UK veterinary students experience poorer mental health and lower levels of well-being (Cardwell et al. 2013).

When asked, Australian veterinary students have named stressors composed into four groups (Liu & van Gelderen 2020). As previously mentioned, these are Academic (e.g., large work-load, difficult content, faculty expectations, competition), transitional (e.g., moving from secondary education/to clinical years, transport, financial difficulties, social interactions), external relationships (e.g.

family illness/death, partner/ marriage relationship difficulties) and veterinary-related (e.g., long working hours, ethical dilemmas, difficult animal–client interactions, euthanasia).

When discussing the role of age and gender regarding veterinary student mental health, the current literature is mostly in agreement that female veterinary students report having poorer mental health than male veterinary students. For example, in a study by Reisberg et al. (2012), 304 US veterinary medicine students from the first three semesters of their education participated. The female students reported higher levels of anxiety and depression, as well as lower levels of life satisfaction and general health compared to the male students. The authors however advise caution when drawing gender-based conclusions from the study, as the proportion of female to male students was close to 4:1.

Cardwell & Lewis (2017) write that some suggest that there are underlying, personal reasons for the negative mental health trends amongst veterinary students as well as veterinarians. That is the characteristics of those successful enough to get admitted into and finish the veterinary education. It is often proposed that the type of person to become a veterinary student is someone with the characteristics of being a high achiever and a perfectionist, which leaves them vulnerable to poor mental health. The typical veterinary student is described by some as someone who chose their future profession based on their love for animals and poor "people skills". However, the authors emphasise that "there is no research evidence to support these claims".

Holden (2020) also describes the role of personality traits, and their importance for the mental health of veterinary students. Perfectionism is described as a common characteristic among veterinary students, which might be necessary to succeed in the meticulous and competitive veterinary medicine programs. The article describes both the positive and negative impact that perfectionism can have on the students' mental health and general well-being and suggests actions for veterinary medicine programs to take on. By teaching "strategies to manage perfectionism, promote resilience, and help students develop healthy ways to set and pursue goals in a high-pressure environment" the students' well-being will be positively impacted. In turn, this will also positively impact the future of veterinary medicine.

Protective factors and buffers against mental health problems are crucial in challenging environments. Examples of this is staying physically healthy and having a social support system (Thoits 2011). Hafen et al. (2013) studied the positive effect of satisfactory personal relationships on 240 US veterinary medicine students. The authors found results that linked students in higher-functioning and satisfactory relationships to fewer reports of depressive symptoms, lower stress associated with work-life balance, less relationship conflict, better physical health and an approved ability to cope with academic expectations.

The conclusion of the article is an encouragement to veterinary educations to implement "policies and programs which foster relationship-building for students".

The importance of healthy coping strategies was addressed in an article by McArthur et al. (2019). The study reported that female veterinary students used more emotional support and instrumental coping strategies, while the male veterinary students demonstrated more use of humour to cope with mental health problems. The role of self-stigma was also mentioned by the authors as harmful to the student's mental health, reducing both wellbeing and resilience.

When discussing the mental health of veterinary students, it is also relevant to compare the data with the research including other groups, such as medical and dentistry students. This is because these three areas of education are similar in many ways, such as having a heavy workload including extensive theoretical and practical/clinical education, and perhaps also in the mental health of their students. Qualitative studies have revealed that medical students feared that by disclosing mental ill-health they would face negative repercussions, and that they should be "invulnerable to illness" (Mckevitt & Morgan 1997; Chew-Graham et al. 2003; Fox et al. 2011).

A Norwegian study compared the mental distress among first-year medical students in Norway between the years 1993 and 2015 (Ruud et al. 2020). Over the 20 years, they found a promising increase in help-seeking activity among the students in need of treatment, but also a significant increase in mental distress among the female medical students. The authors indicated a strong link between mental distress and low social support from friends and family.

When comparing the three areas, multiple studies suggest that the prevalence of mental health issues among medical and dentistry students is lower than that among veterinary medicine students (Basudan et al. 2017; Silva et al. 2017; van Dijk et al. 2017; Zyl et al. 2017). However, one study has reported higher rates of depression in dentistry students compared to both veterinary medicine students and medical students (Ozkurt Kayahan et al. 2017). To conclude, it has been shown that many students in medicine related areas of education struggle with their mental health, and veterinary students are often found to be among those with the most alarming data.

While comparing the previously mentioned groups of students, it is also of importance to compare the data with the general population. However, the statistics regarding national mental health varies between countries and continents. Table 1. gives examples of some longitudinal studies regarding the development of depression rates in the population of different countries.

Table 1. Summary of six studies regarding the rates of depression in samples of the general national population over time.

Author & publication year	Country	Years compared	Prevalence (cases/sample size) first year	Prevalence (sample size) last year
(Baumeister et al. 2015)	Germany	1997 & 2008	28.81(1241/4308)	30.09(1330/4420)
(Economou et al. 2013)	Greece	2008-2011	3.32(73/2197)	8.20(185/2256)
(Goldney et al. 2010)	Australia	1998 & 2008	6.81(205/3010)	10.32(313/3034)
(Markkula et al. 2017)	Chile	2003 & 2010	18.57(672/3619)	16.61(839/5052)
(Patten et al. 2016)	Canada	2002 & 2012	4.70(1739/36984)	4.80(1205/25113)
(Park et al. 2015)	South Korea	2001 & 2011	2.87(36/1256)	3.94(42/1066)

In many countries, the belief that the rate of mental illness has increased is based on the increased psychiatric utilisation rates, antidepressant prescriptions which have doubled between 2000 and 2015(OECD 2017), and rates of disability pensions claimed due to mental illness. Examples of these countries are the UK, Australia and Switzerland (Viola & Moncrieff 2016; Harvey et al. 2017). In a systematic review by Richter et al. (2019), the authors challenge the view that mental illness rates have increased globally. Two Canadian studies suggest that while utilisation of psychiatric services and prescription of antidepressants may have increased because of an rising prevalence of mental health problems, it could also indicate a growing help-seeking and willingness to receive psychiatric treatment and overuse or off-label prescriptions (Wong et al. 2016, 2017). Regarding the increase of disability pension rates due to mental illness, it was suggested in 2006 to possibly be a consequence of "a changing labour market with fewer physically demanding workplaces"(Richter et al. 2019).

When looking at more specific data for people aged 16-84 from 2011 to 2021 in Sweden, women have consistently reported high levels of severe anxiety compared to men (Public Health Agency of Sweden 2022). The prevalence is especially high among young women aged 16-29. In the studied decade, the prevalence of severe anxiety have increased for both genders in the age group 16-29. For women the increase has gone from 9% in 2011 to 20% in 2021, and for men 5% in 2011 to 10% in 2021.

Exposure to the worldwide pandemic during 2020-2022 was a unique type of experience, which many reports suggest plays a part in the increasing rates of

mental health struggles. Some authors suggest that the COVID-19 pandemic with its extreme threat to the individual as well as the community triggered feelings of fear, worry and stress (Fullana & Littarelli 2021; Gonda & Tarazi 2021). Others however have reported the opposite, that the negative effect on public mental health actually decreased during lockdowns in France and the UK (Foa et al. 2020; Recchi et al. 2020).

To summarize, it is not only veterinary students who struggle with their mental health, but they seem to do so on to larger degree than the general population. Similarly to the existing literature regarding the mental health of veterinary professionals, there is also several studies showing that veterinary students in countries such as USA (eg. Reisbig et al. 2012; Killinger et al. 2017), the UK (eg. Cardwell et al. 2013; Cardwell & Lewis 2017) and Australia (eg. McArthur et al. 2019) exhibit patterns of lower mental wellbeing compared to the general population.

3. Material and methods

3.1 Survey administration

The survey questions were based on the “COPSOQ III Guidelines and questionnaire” (COPSOQ International Network n.d.). The Copenhagen Psychosocial Questionnaire (COPSOQ) is described as “A widely used research-based non-commercial tool for psychosocial workplace surveys” (Berthelsen et al. 2020). Eleven separate dimensions were selected based on their relevance for the project. All the questions included in these dimensions were subsequently included in the survey. The selected dimensions and their respective questions were as follow: Emotional demands (three questions ED1, EDX2 & ED3), Work engagement (three questions WE1-3), Work life conflict (six questions WF1-6), Self-related health (two questions GH1-2), Sleeping troubles (four questions SL1-4), Burnout (four questions BO1-4), Stress (three questions ST1-3), Somatic stress (four questions SO1-4), Cognitive stress (four questions CS1-4), Depressive symptoms (four questions DS1-4) and Self efficacy (six questions SE1-6). For some of these dimensions, COPSOQ III includes a short explanatory text, motivating their significance in the question-naire. These comments are shown in table 2. Because COPSOQ III is tailored to working professionals, the word "work" was explained to the participants to have a different meaning in this survey to make it applicable to university students. In this survey "work" referred to the student’s experience, responsibilities and expectations as a current veterinary student. It may also refer to the university where they are currently enrolled in the veterinary program. This interpretation was explained in the introductory text of the survey, as shown in appendix 1.

Table 2. COPSOQ III comments on the dimensions selected for the survey, quoted from Burr et al. (2019). Additional information on some of the dimensions is translated from Swedish to English by the author from COPSOQ Sweden.

Dimension	**COPSOQ III comment** (Burr et al. 2019)	**Additional comment from COPSOQ Sweden** (COPSOQ Sverige n.d.a)
Emotional demands (questions ED1, EDX2 & ED3)	*Emotional Demands occur when the worker has to deal with or is confronted with other people's feelings at work. Other people comprise both people who are not employed at the workplace, e.g., customers, clients, or pupils, and people employed at the workplace, such as colleagues, superiors, or subordinates.*	Emotional demands almost always occur when working with people. In situations with high emotional demands, it is important that the work is laid out so that the workers are given adequate conditions to handle these demands. High emotional demands generally lead to higher work absence and is strongly related to long time sick leave.
Work engagement (questions WE1-3)	*This dimension deals with the attachment you feel to the task independently of how you experience your workplace*	Work engagement can be defined as a positive, work-related state of mind. Workers with a strong work engagement feel energy in relation to their work assignments, view themselves as efficient and able to handle the different work demands. Work engagement is a so-called outcome measure, which can be influenced by changing factors in the organizational and social work environment.
Work life conflict (questions WF1-6)	*Work Life Conflict deals with the possible consequences of work on privacy or on personal and family life and includes conflict regarding energy (mental and physical energy) and conflict regarding time.*	These questions highlight the possible conflict between work and family/personal life. The questions mainly focus on two areas, conflict regarding energy (mental and physical energy) and conflict regarding time.
Self-related health (questions GH1-2)	*Self-rated/perceived health is the person's assessment of her or his own general health.*	Self-related health is the individual's evaluation of their own general state of health and has shown to be an independent risk factor for both illness and mortality. Hence, this scale is often included in population studies regarding health and illness.
Sleeping troubles (questions SL1-4)	*Sleeping Troubles deal with sleep length, determined by e.g., sleeping in, waking up and interruptions of sleep, and quality of sleep.*	No comment regarding this dimension.

Burnout (questions BO1-4)	*Burnout concerns the degree of physical and mental fatigue/ exhaustion of the employee.*	Within COPSOQ the focus regarding burnout is the component of the degree of physical and mental fatigue/exhaustion for the worker. An increased degree of burnout is connected to increased absence, work leave, sleeping troubles, depressive symptoms, risk of heart disease and increased mortality.
Stress (questions ST1-3)	*Stress here is defined as a reaction of the individual, and as a combination of tension and displeasure. As elevated stress levels over a longer period are detrimental to health, it is necessary to determine long-term states of stress.*	Stress is often defined as a combination of excitement and uneasiness. Short term stress can be healthy and good when one should perform on a slightly higher level than normally. However, a heightened level of stress during a longer period is harmful for both quality of life, work effort and health.
Somatic stress (questions SO1-4)	*Somatic Stress is here defined as a physical health indicator of a sustained stress reaction of the individual.*	No comment regarding this dimension.
Cognitive stress- (questions CS1-4)	*Cognitive Stress is here defined as cognitive indicators of a sustained stress reaction of the individual.*	No comment regarding this dimension.
Depressive symptoms (questions DS1-4)	*Depressive Symptoms cover aspects which together indicate depression.*	No comment regarding this dimension.
Self-efficacy (questions SE1-6)	*Self-Efficacy is the extent of one's belief in one's own ability to complete tasks and reach goals. Here self-efficacy is understood as global self-efficacy not distinguishing between specific domains of life.*	No comment regarding this dimension.

Thus, when interpreting the numerical results, it is important to note that a high score signifies different conclusions depending on the dimension. To simplify, a high score can indicate alternatively positive and negative mental health depending on the dimension as explained below (COPSOQ Sverige n.d.b). Within one dimension, all included question's scores are interpreted in the same way where a high score is either desirable or not desirable. The interpretation for the different dimensions is explained below.

Low desirable score: A high score indicates a high frequency of the negative dimension subject; hence a low score is desirable for the following dimensions:

- Emotional demands
- Work life conflict
- Sleeping troubles
- Burnout
- Stress
- Somatic stress
- Cognitive stress
- Depressive symptoms

High score desirable: A high score indicates a high frequency of the positive dimension subject; hence a high score is desirable for the following dimensions:

- Work engagement
- Self-related health
- Self-efficacy

COPSOQ III is a questionnaire designed to be applicable to working life experiences, so the previously mentioned dimensions were selected because they could also be applied to student education life experiences. The questionnaire is available in several languages, and has been validated in multiple countries such as Sweden (Berthelsen et al. 2020), Germany (Lincke et al. 2021) and Portugal (Rosário et al. 2017). An additional validation study is currently under review in Australia (Rahimi et al. 2025). In 2021 a literature review was written on the COPSOQ evolution (Kanazawa & Cotrim 2021).

Four basic initial questions regarding the responder's age, gender, country of education and current year of education were included in addition to the questions from COPSOQ III. A final question was also added regarding areas potentially related to mental health struggles in veterinary students (Liu & van Gelderen 2020). The survey was divided into three chapters: one initial chapter, one regarding the psychosocial work environment and one regarding the responder's health. The complete survey is shown in appendix 2.

To ensure that the project was kept at a manageable size for the time frame provided, only a handful of countries were selected to participate. Sweden, Norway, Denmark, Finland, the UK and Australia. These countries have a similar layout to their veterinary medicine programs (SLU 2022; NMBU n.d.; Copenhagen University n.d.; University of Helsinki n.d.; University of Bristol n.d.; Murdoch University n.d.) which benefit the data analysis and comparison of the results of the data between the respective countries.

IVSA, International Veterinary Students Association, is described as a student-run organization representing over 38 000 veterinary students from over 70

countries (IVSA n.d.). One of the main goals of the IVSA is to raise the overall standard of the veterinary education worldwide. To reach veterinary students in the selected countries, the author via email contacted the national IVSA (International Veterinary Student Association) member organizations of Sweden, Denmark, Norway, Finland, the UK and Australia. These member organizations have access to the email addresses of all their respective students, which is the main channel chosen to distribute the survey. The survey was also advertised to students in various Facebook groups by the author to increase participation rates.

Before the survey was distributed to these IVSA member organizations, contact and confirmation was established to assure that the students participating would have an equal amount of time to answer the survey before the deadline. Because the UK and Australia has multiple veterinary education establishments (VEEs) as opposed to the participating Scandinavian countries, a preliminary limit was set to a maximum of three participating universities per country. In the UK, contact was initiated with several separate VEEs. However, due to a lack of responses, contact was instead established with the national IVSA UK representative who was able to distribute the survey nationwide. Hence, responses were sent to more than three universities in the UK. In Australia, Murdoch University in Perth was selected. Due to no reply from IVSA Australia, contact was instead established with staff at the School of Veterinary Medicine at Murdoch University. The participants from the selected universities were limited to students in year three to six of their education, to include mainly students in their clinical years of the veterinary program.

The survey was sent to the students by the previously confirmed IVSA member organizations on October 1st 2024**,** and the deadline to fill out the survey was set to October 22nd 2024, three weeks later**.** A reminder to fill out the survey was sent out to the students on October 15th, one week before the deadline.

The participants were informed of the anonymity and data collection before initiating the survey.

3.2 Data analysis

To objectively compare the results from the survey, a numerical data analysis was done after converting the survey responses to their equivalent scores from the Google form to Google Sheets. All calculations were performed via Excel and Google Sheets. A scoring was made based on the survey answers according to the scales used in the selected COPSOQ III dimensions (COPSOQ International Network n.d.). Each response option throughout the COPSOQ III-based questions signifies a certain numerical score between 0-100. By converting all alphabetical responses to numerical scores, data such as average scores per dimension per country etc was obtained.

The scoring is explained in the following quote from the COPSOQ III guidelines and Questionnaire (COPSOQ International Network n.d.):

> *Response options explanation (and values for the scale - each scale is scored in the direction indicated by the scale name):
>
> 1. ED1, EDX2: Always (100); Often (75); Sometimes (50); Seldom (25); Never/hardly ever (0)
>
> 2. ED3: To a very large extent (100); To a large extent (75); Somewhat (50); To a small extent (25); To a very small extent (0)
>
> 3. WE1-3: Never (0), Seldom (25), Sometimes (50), Often (75), Always (100)
>
> (…)
>
> 7. GH1: Excellent (100), Very good (75), Good (50), Fair (25), Poor (0)
>
> 8. GH2: 0 (0- worst), 1 (10), 2 (20), 3 (30), 4 (40), 5 (50), 6 (60), 7 (70), 8 (80), 9 (90), 10 (100- best)
>
> 9. ST1-3, BO1-4, ST1-3), SO1-4, CS1-4, DS1-4: All the time (100); A large part of the time (75); Part of the time (50); A small part of the time (25); Not at all (0)
>
> 10. SE1-6: Fits perfectly (100); Fits quite well (67); Fits a little bit (33); Does not fit (0)

By converting the survey responses to the scores above, the data could be arranged and compared between countries, to reference values etc. As the final question in the survey regarding potential causes was not taken from COPSOQ III, but from the article by Liu & van Gelderen (2020), this question was not a part of the numerical scoring mentioned above but shown separate.

According to COPSOQ III, when comparing two sets of scores, only a difference of at least 5-10 points is considered as a significant difference (Berthelsen et al. 2020). The following colour coding for the comparisons made in tables 4 and 5 was created by the author in accordance with the COPSOQ significance level:

- Green (significant difference): indicates a score difference of ≥5 points more desirable
- Blue (not significant difference): indicates a score difference <5 points more or less desirable, making the two scores comparable to each other
- Orange (significant difference): indicates a score difference ≥5<10 points less desirable
- Red (significant difference): indicates a score difference ≥10 points less desirable

Calculation of confidence intervals (CI), standard deviation (SD) and average scores were performed using Excel formulas.

Two sets of average scores were calculated in the following manner:

- Average across all participants=
  $all\ scores\ added/number\ of\ total\ participants$
- Average across countries=
  $individual\ country\ scores\ added/number\ of\ participating\ countries$

When looking at the results from this survey, it is important to have a baseline to compare with to be able to interpret the results correctly. The COPSOQ net-work has developed reference scores based on the results from previous COPSOQ surveys in Sweden for some of the dimensions included in appendix 1. Along with reference scores for multiple occupational groups, COPSOQ has also published reference values regarding some of its dimensions for nine main occupational groups, each group containing subgroups of more specific professions within similar fields. Since there is no existing data regarding COPSOQ III and veterinary professionals, the occupational group most appropriate to compare this survey's result to is "other healthcare professionals", hence this group's reference value has been added to the comparison in table 4. The rest of the dimensions' reference scores are from a recent research validity article regarding the psychosocial wellbeing of an Australian working population sample containing 2,446 participants (Rahimi et al. 2025).

In accordance with the COPSOQ III guidelines (Berthelsen et al. 2020), the scores from those dimensions where a participant has chosen the option "Do not know/do not wish to answer" in more than 50% of that dimension's questions, has not been included in the scoring of that dimension. In those cases where a participant has chosen the option "Do not know/do not wish to answer" in more than 0% but equal to or less than 50% of that dimension's questions, the specific questions with that answer have been excluded from the scoring.

4. Results

4.1 Study population

As previously mentioned, the survey was open for three weeks in October 2024. According to the distributers in all selected countries except for Denmark, a link was sent out via email to all veterinary medicine students in year 3-6. The number of students who received the survey according to the distributors is displayed in table 3. In total, 249 people had responded to the survey at the time of closing. 100 from Sweden, 39 from Norway, 0 from Denmark, 41 from Finland, 31 from the UK and 38 from Australia. Despite receiving written confirmation from IVSA Denmark regarding distributing the survey to the veterinary students at the University of Copenhagen, no response was received from any Danish students. Despite the wide range of universities among the UK participants, the results were included in this study because of the similar participation frequency between the selected countries apart from Sweden, Denmark not included. Out of the participating 249 students, 10 participants stated as not being in year three, four, five or six. Because of this, the results were excluded from the following participants: three from Sweden, five from Finland, one from the UK and one from Australia. This leaves results to be interpreted from 239 participants distributed as follow:

- 97 from Sweden
- 39 from Norway
- 36 from Finland
- 30 from the UK
- 37 from Australia.

From this point, these participants will be described as "(all) participants" or "(all) responders". This is equivalent to the response rates shown in table 3.

Table 3. Total number of students, number of survey participants and response rates in percent per country, with one decimal. Student numbers as reported by local IVSA/university representative.

Country	Sweden	Norway	Denmark	Finland	UK	Australia
Total number of students in year 3-6	369	334	Approx. 610	Approx. 280	Information not provided by all participating universities.	310
Number of participants in the survey	97	39	0 *(the survey was never distributed to any Danish students)*	36	30 (participants from 9 different universities)	37
Equivalent response rate	26.3%	12.0%	0%	12.9%	-	11.9%

Sweden, Norway and Finland only offer the veterinary education at one university each. Therefore, all 97 participating Swedish veterinary students were studying at the Swedish University of Agricultural Sciences, all 39 participating Norwegian veterinary students were studying at the Norwegian University of Life Sciences and all 36 participating Finnish veterinary students were studying at the Helsinki University at the time of participation in the survey.

In the UK there are currently 11 universities which provide the veterinary education. Among the 30 participants from the UK, the following distribution was observed: 7 participants from Royal Veterinary Collage, University of London, 6 participants from University of Liverpool, 5 participants from University of Nottingham, 4 participants from University of Surrey, 3 participants from University of Bristol, 2 participants from University of Cambridge, 1 participant from The Royal (Dick) School of Veterinary Studies, University of Edinburgh, 1 participant from Harper & Keele Veterinary School, 1 participant from University of Glasgow and 1 participant who did not name their university.

In Australia there are several universities who offer the veterinary education. Because the distribution of the survey in Australia was done via direct contact with Murdoch University in WA, all 37 participants were studying at this university at the time of the study.

The age and gender distribution are shown in figures 1 and 2. The country and year of education is shown in figures 3 and 4. Despite efforts from the author, information regarding the age and gender ratio among the veterinary students from the respective countries was not possible to be obtained. Hence, the representativity is unknown for these two factors.

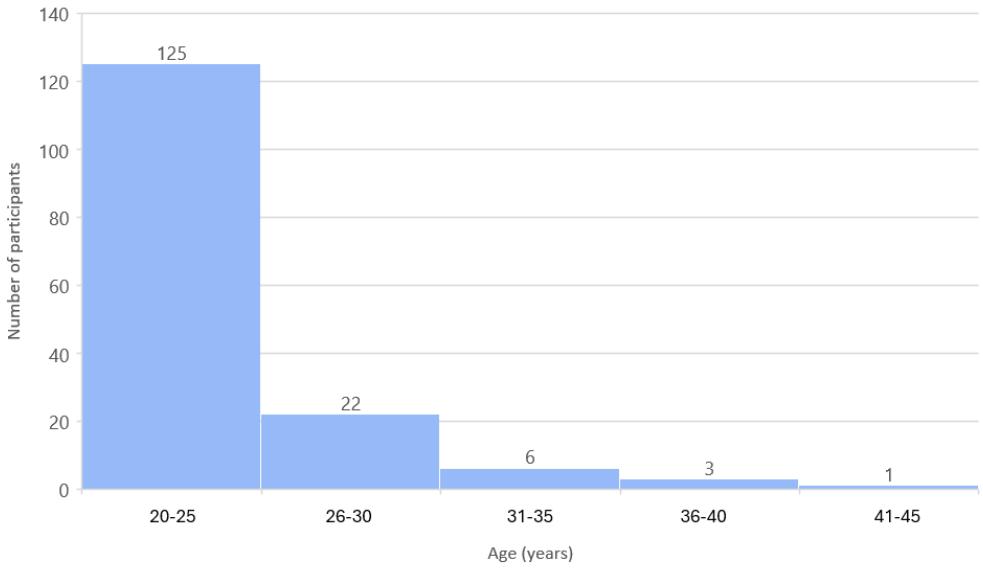

Figure 1. The age distribution among all the participants in the survey.

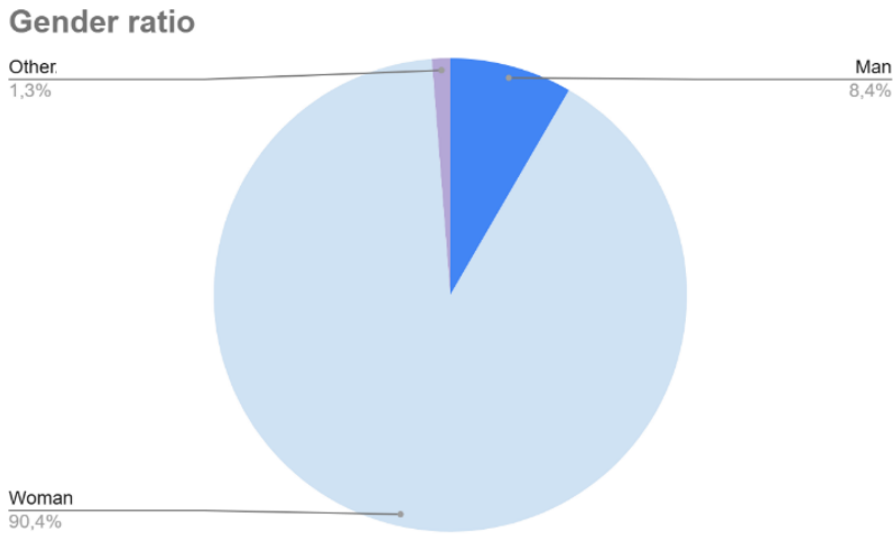

Figure 2. The gender distribution among all the participants in the survey.

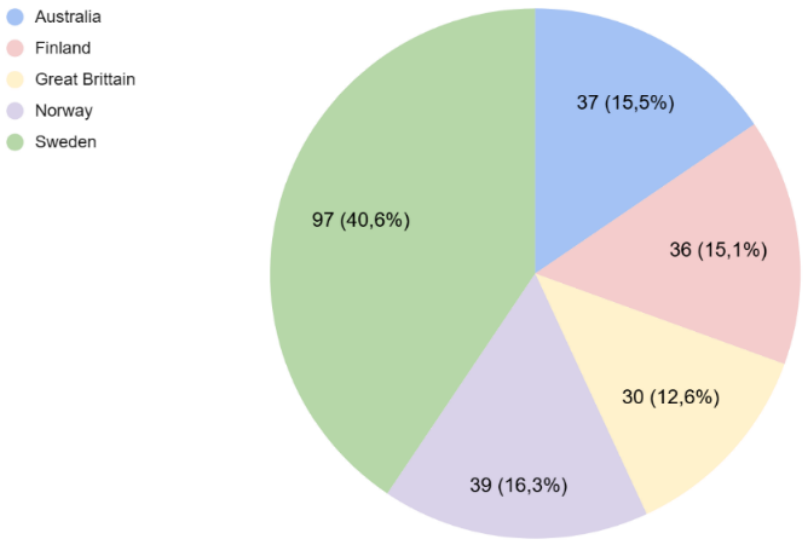

Figure 3. The country of study distribution among all the participants in the survey.

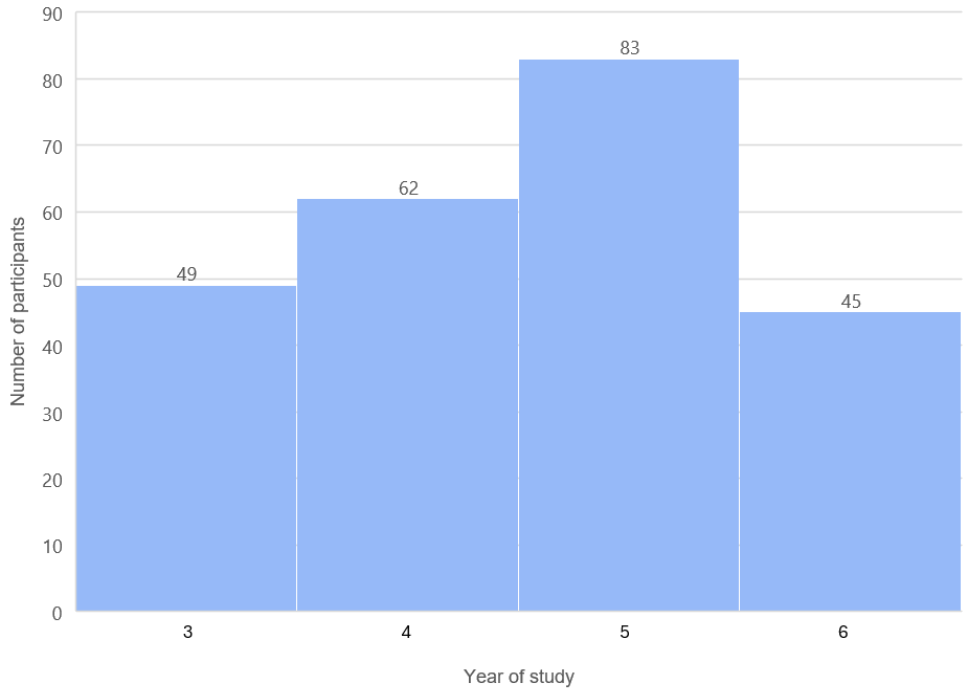

Figure 4. The year of study distribution among all the participants in the survey.

Please note that the length of the veterinary education varies slightly between the universities and countries.

Appendix 5 shows the more in-depth data of participant age, gender and year of education among the participants from every participating country.

4.2 The general psychosocial wellbeing

Table 4 displays the comparison between the scores across all participants per dimension and the COPSOQ III reference value, with colour coded categories to ease interpretation. Do note that when taking the 95% confidence intervals into consideration, the following comparisons can change into a different colour category:

- Work engagement (general population comparison) changes from blue to green
- Self-related health (other healthcare professionals comparison) from orange to blue
- Sleeping troubles (general population comparison) from green to blue
- Self-efficacy (general population comparison) from red to orange

Table 4. Comparison between average score across all participants and the available reference values for everyone, and the average for the category "other healthcare professionals". Scale 0-100 for all dimension scores. Colour background significance: Green (significant difference): indicates a score ≥5 points more desirable than the reference score. Blue (not significant difference): indicates a score <5 points more or less desirable than the reference score, making the two scores comparable to each other. Orange (significant difference): indicates a score ≥5<10 points less desirable than the reference score. Red (significant difference): indicates a score ≥10 points less desirable than he reference score.

Dimension	**Average score across all participants (95% CI)**	**Reference score general population** (Rahimi et al. 2025)	**Reference score other healthcare professionals** (COPSOQ n.d.c)	**Survey score difference to the respective reference score**
Emotional demands	55.0 (±2.3)	40.5	54	+14.5 (+1)
Work engagement	58.4 (±2.0)	55.3	no data available	+3.1
Work life conflict	53.4 (±3.1)	40.1	no data available	+13.3
Self-related health	57.5 (±2.5)	57	64	+0.5 (-6.5)
Sleeping troubles	36.8 (±2.9)	44.6	no data available	-7.8
Burnout	60.3 (±2.7)	47.6	24	+12.7 (+36.3)
Stress	55.8 (±2.7)	40.2	27	+15.6 (+28.8)
Somatic stress	39.7 (±2.6)	27.0	no data available	+12.7
Cognitive stress	52.6 (±3.0)	33.3	no data available	+19.3
Depressive symptoms	49.3 (±2.7)	34.7	No data available	+14.6
Self-efficacy	540 (±2.5)	64.2	No data available	-10.2

Figures 5-16 presents the response ratio per question for all the participants of the survey, arranged per dimension. A summary of average scores per dimension can be found in table 4, along with the country specific scores to be discussed in chapter 4.3. Note that because of the participant distribution between the different countries shown in figure 3, the distribution of the responses in figures 5-16 are heavily influenced by the more than 40% Swedish participants.

Emotional demands

Figure 5a-c shows the results of the survey questions from the dimension “Emotional demands”.

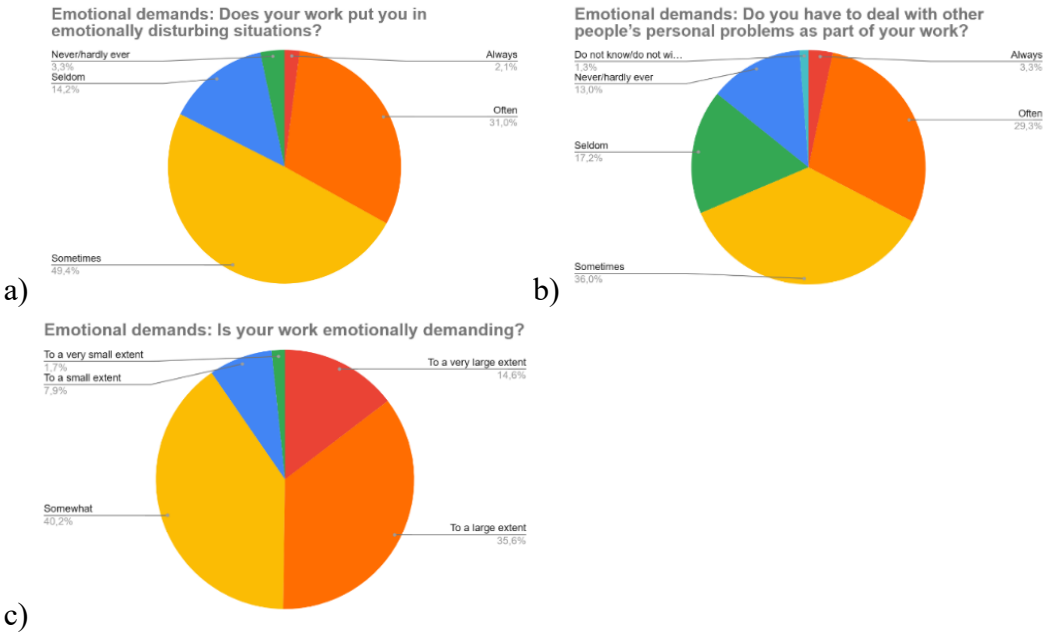

Figure 5. Response distribution for the dimension ***emotional demands.*** *Survey questions are cited in each figure and refers to a) ED1-Emotional disturbing, b) EDX2-Deal with other people's problems and c) ED3-Emotionally demanding.*

Work life conflict

Figure 6a-e shows the results of the survey questions from the dimension "Work life conflict".

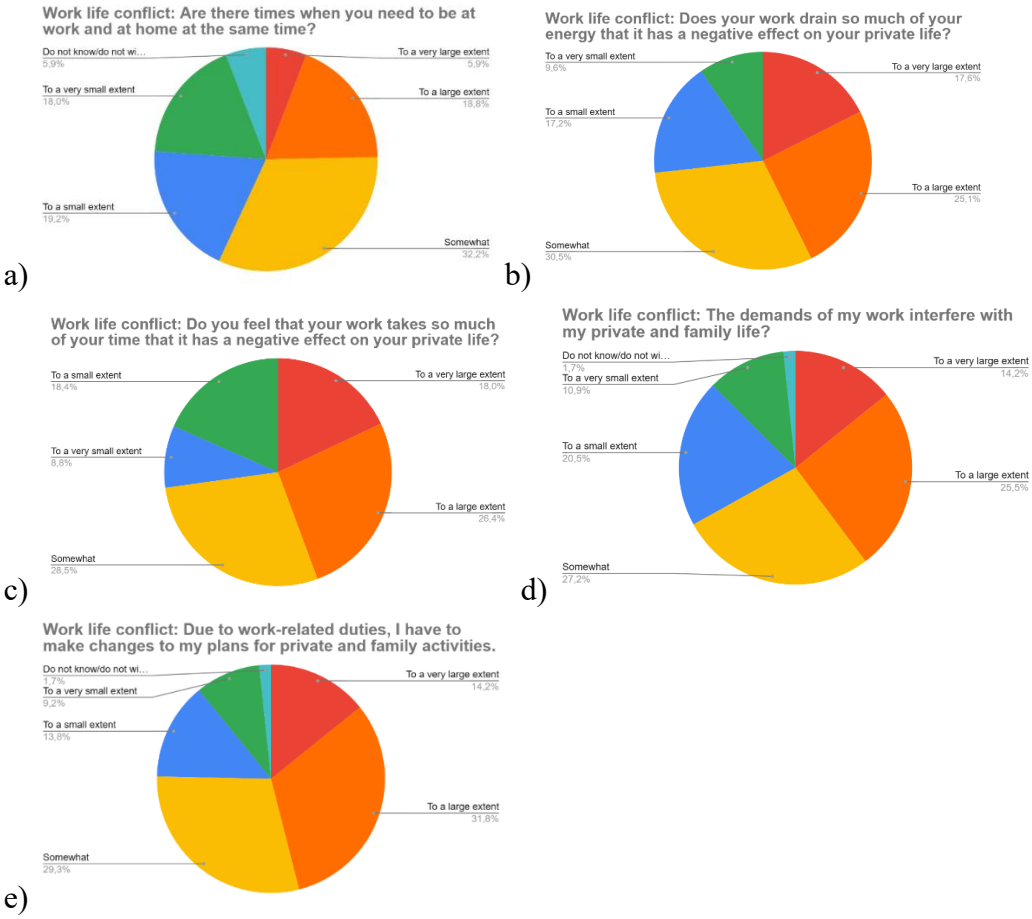

*Figure 6. Response distribution for the dimension **work life conflict**. Survey questions are cited in each figure and refers to a) WFX1-Being in both places, b) WF2-Energy conflict, c) WF3-Time conflict, d) WF5-Work demands interfere and e) WF6-Change plans.*

Work engagement

Figure 7a-c shows the results of the survey questions from the dimension "Work engagement".

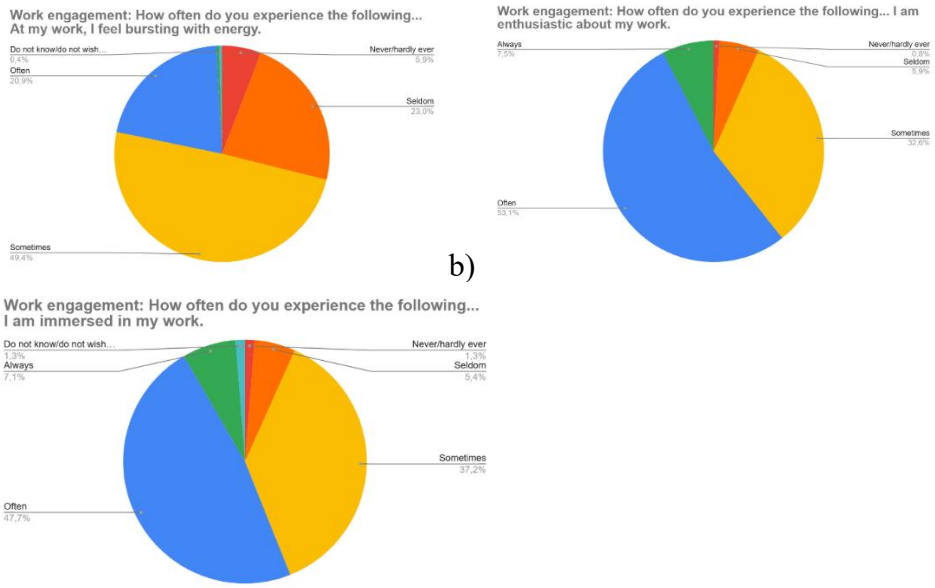

*Figure 7. Response distribution for the dimension **work engagement**. Survey questions are cited in each figure and refers to a) WE1-Burst with energy, b) WE2-Enthusiastic and c) WE3-Immersed.*

Self-related health

Figure 8a-b shows the results of the survey questions from the dimension "Self-related health".

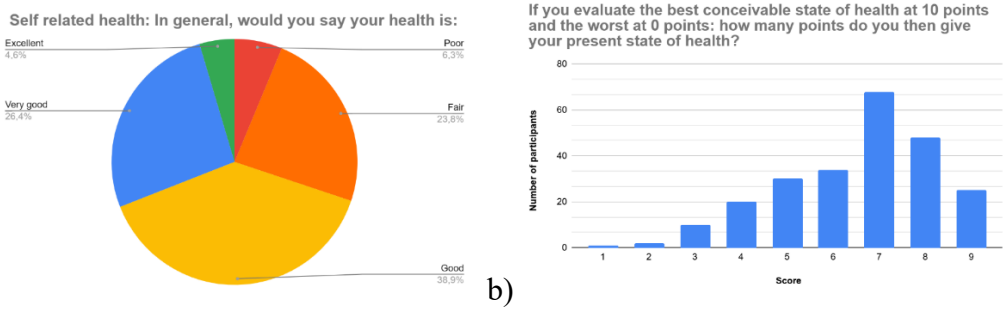

*Figure 8. Response distribution for the dimension **self-related health**. Survey questions are cited in each figure and refers to a) GH1-General health and b) GH2-Rate in 10 points.*

Sleeping troubles

Figure 9a-d shows the results of the survey questions from the dimension "Sleeping troubles".

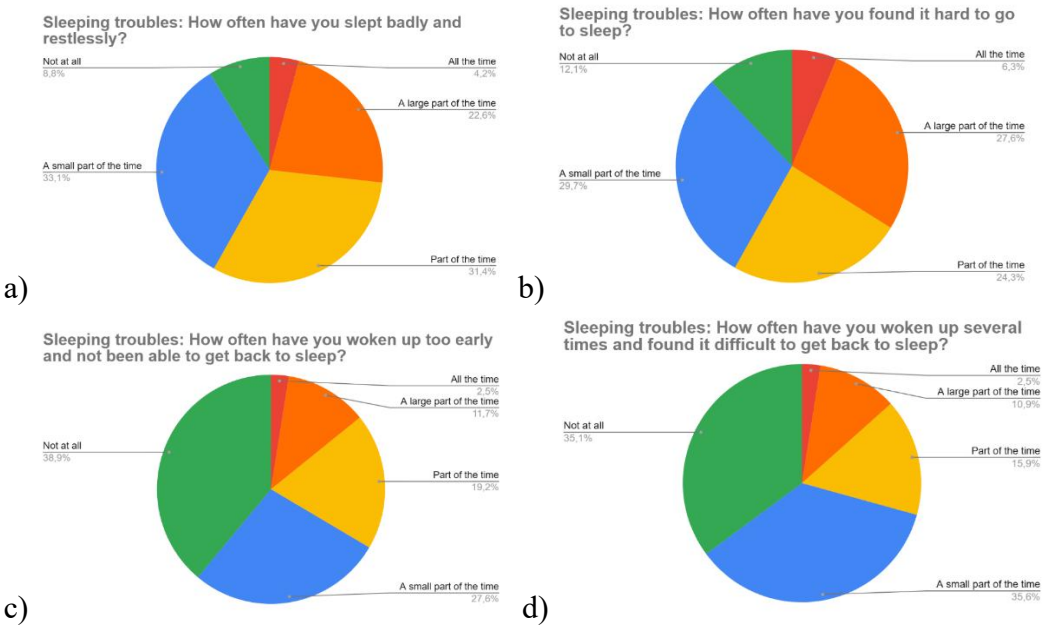

*Figure 9. Response distribution for the dimension **sleeping troubles.** Survey questions are cited in each figure and refers to a) SL1-Slept badly, b) SL2-Hard to sleep, c) SL3-Woken up early and d) SL4-Woken up several times.*

Burnout

Figure 10a-d shows the results of the survey questions from the dimension "Burnout".

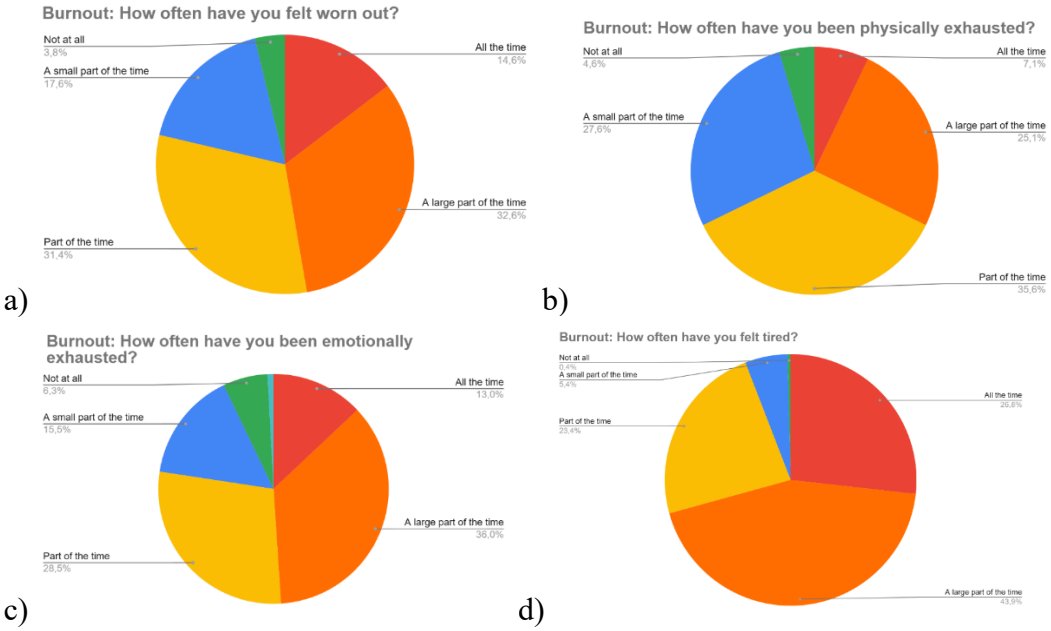

*Figure 10. Response distribution for the dimension **burnout**. Survey questions are cited in each figure and refers to a) BO1-Worn out, b) BO2-Physically exhausted, c) BO3-Emotionally exhausted and d) BO4-Tired.*

Stress

Figure 11a-c shows the results of the survey questions from the dimension "Stress".

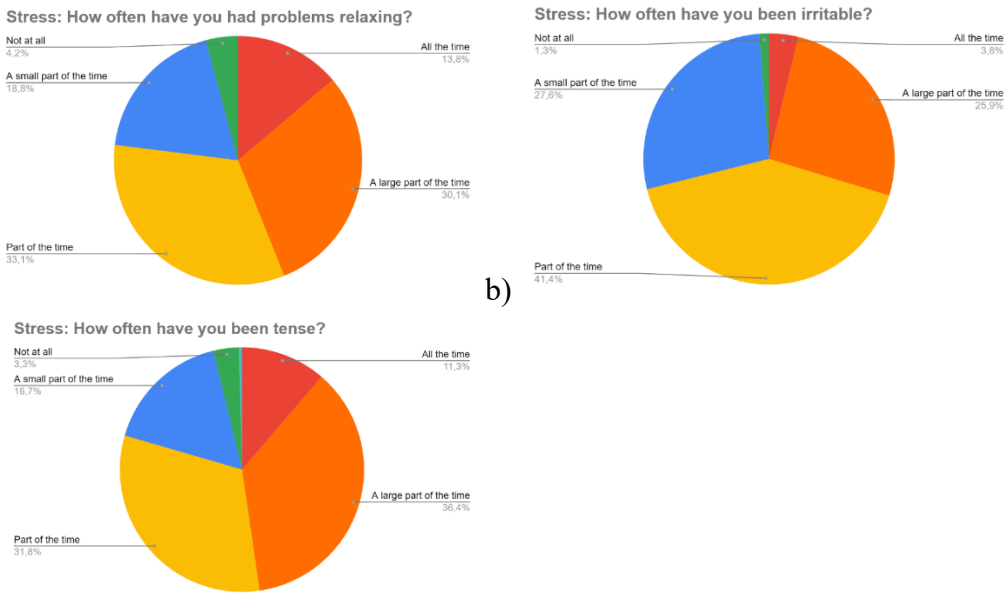

*Figure 11. Response distribution for the dimension **stress**. Survey questions are cited in each figure and refers to a) ST1-Problems relaxing, b) ST2-Irritable and c) ST3-Tense.*

Somatic stress

Figure 12a-d shows the results of the survey questions from the dimension "Somatic stress".

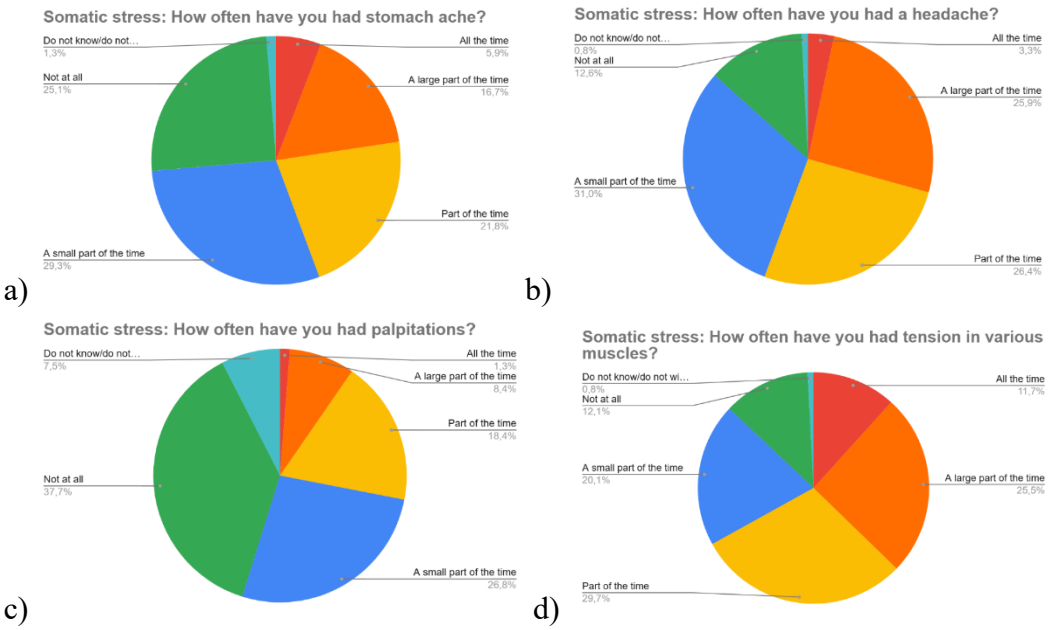

*Figure 12. Response distribution for the dimension **somatic stress**. Survey questions are cited in each figure and refers to a) SO1-Stomachache, b) SO2-Headache, c) SO3-Palpitations and d) SO4-Muscle tension.*

Cognitive stress

Figure 13a-d shows the results of the survey questions from the dimension "Cognitive stress".

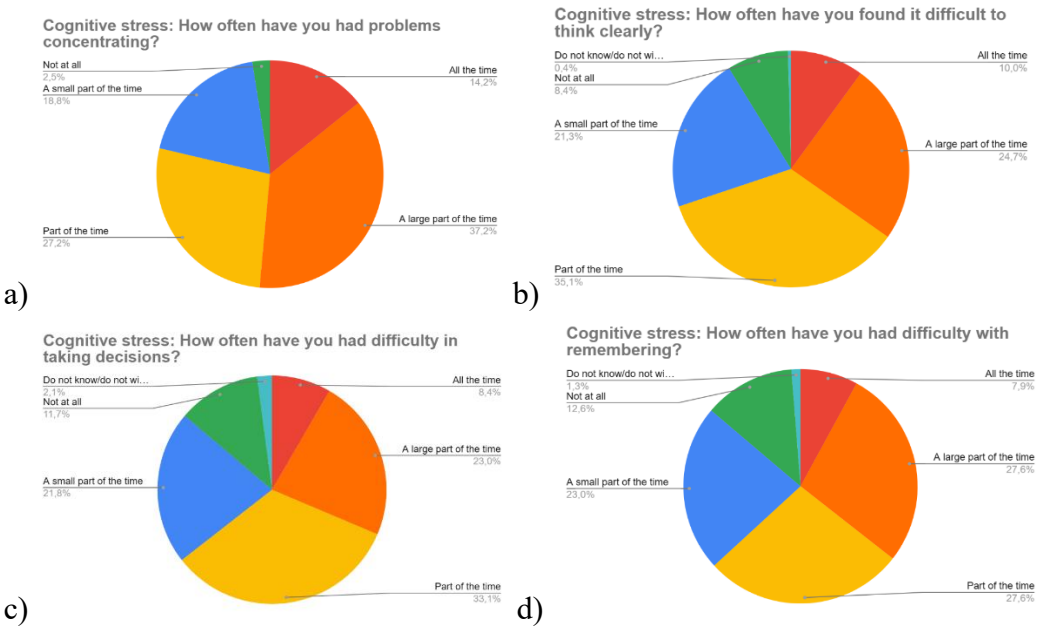

*Figure 13. Response distribution for the dimension **cognitive stress**. Survey questions are cited in each figure and refers to a) CS1-Problems concentrating, b) CS2-Difficult thinking clearly, c) CS3-Difficult taking decisions and d) CS4-Difficult remembering.*

Depressive symptoms

Figure 14a-d shows the results of the survey questions from the dimension "Depressive symptoms".

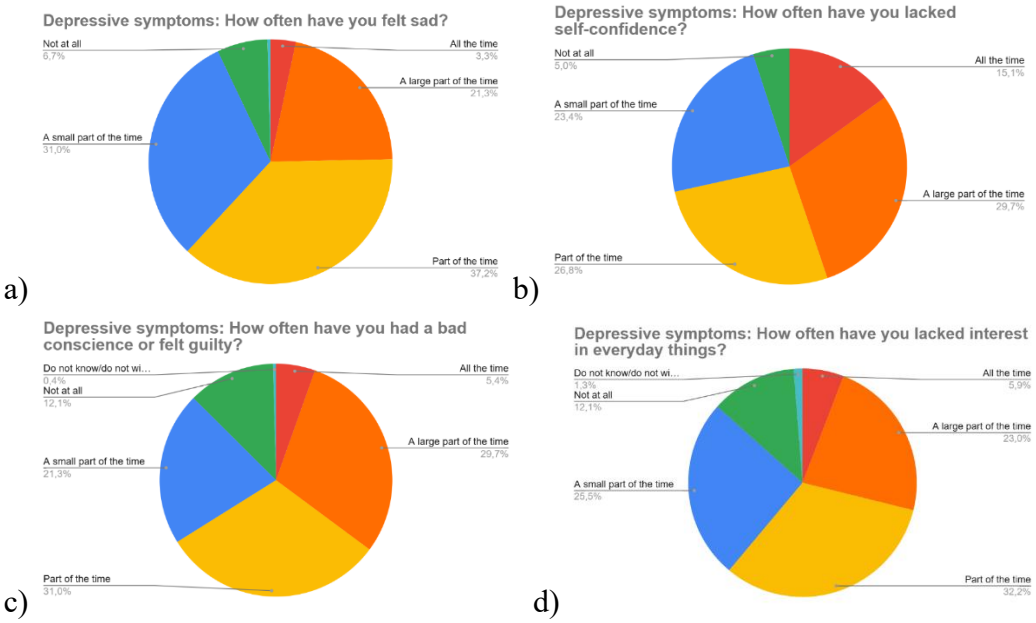

*Figure 14. Response distribution for the dimension **depressive symptoms**. Survey questions are cited in each figure and refers to a) DS1-Sadness, b) DS2-Lack of self-confidence, c) DS3-Feel guilty and d) DS4-Lack of interest in daily activity.*

Self-efficacy

Figure 15a-f shows the results of the survey questions from the dimension "Self-efficacy".

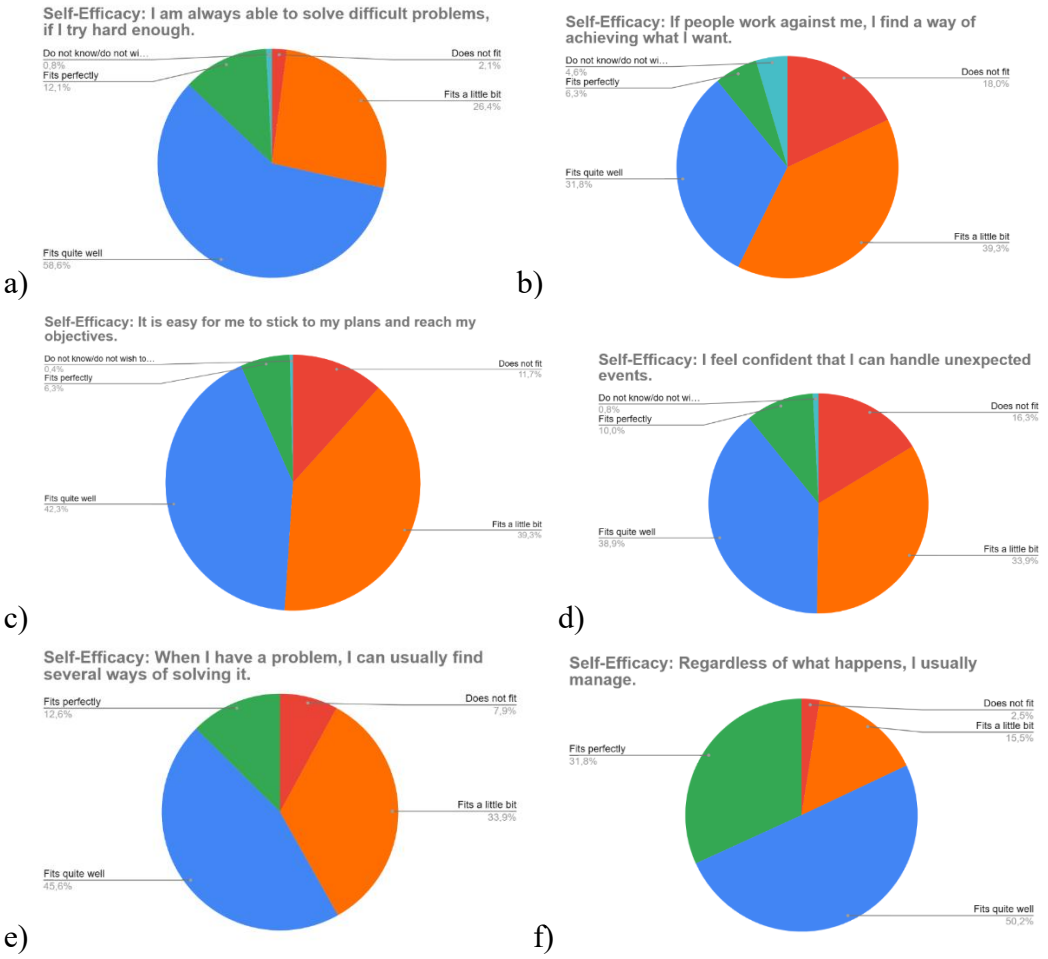

*Figure 15. Response distribution for the dimension **self-efficacy**. Survey questions are cited in each figure and refers to a) SE1-Solve problems, b) SE2-Achieving what I want, c) SE3-Reach objectives, d) SE4-Handle unexpected events, e) SE5-Several ways solving problems and f) SE6-Usually manage.*

Potential causes

The survey question regarding potential causes for low mental health does not derive from COPSOQ III, but as previously mentioned from an article by Liu & van Gelderen (2020). Because of this, the response options do not have a numerical scoring equivalent to the COPSOQ III questions.

The question was: "In your own experience and opinion, how much do the following areas negatively affect your current mental wellbeing?" The four areas were as reported in figures 16a-d:

- Academic (e.g., large workload, difficult content, faculty expectations, competition)
- Transitional (e.g., moving from secondary education/to clinical years, transport, financial difficulties, social interactions)
- External relationships (e.g. family illness/death, partner/marriage relationship difficulties)
- Veterinary-related (e.g., long working hours, ethical dilemmas, difficult animal–client interactions, euthanasia)

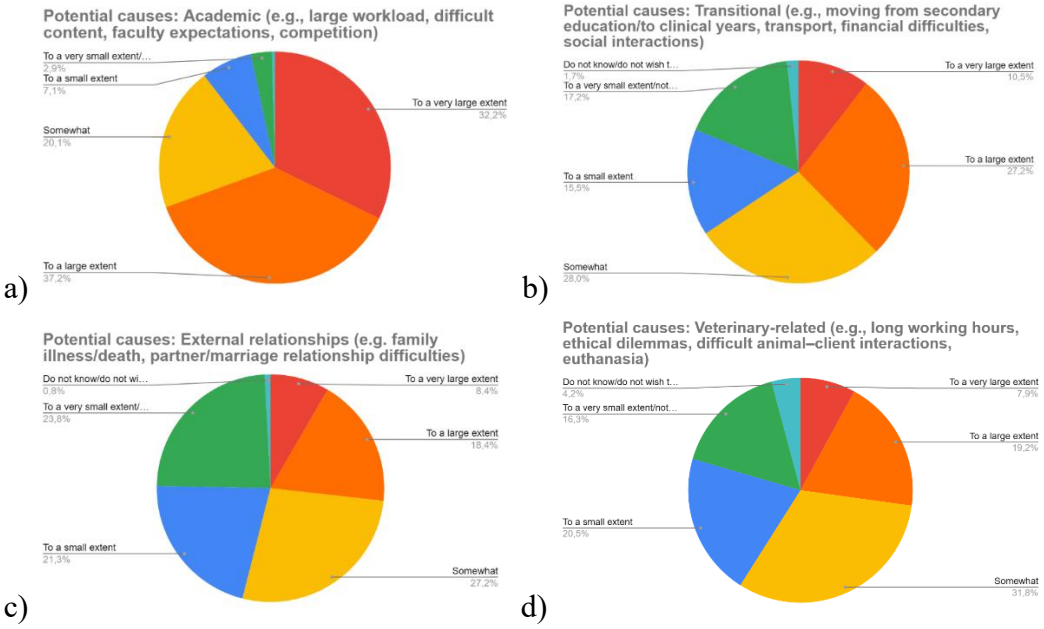

*Figure 16. Response distribution for the question regarding **potential causes**. Survey questions are cited in each figure.*

As shown in figures 16a-d, the area out of the four presented most frequently reported by the participants as having a negative effect on their mental health is academic (32.2% To a very large extent, 37.2% To a large extent). The area out of the four least frequently reported by the participants as having a negative effect on their mental health is external relationships (8.4% To a very large extent, 18.4% To a large extent).

4.3 The country specific psychosocial wellbeing

The results from the survey yielded several sets of scores. Firstly, the scores per dimension for all the participants across countries, which is calculated as an average score of the individual country's scores. This calculation was made to achieve a more representative average score since the representation per country

varied between 13-40%. Appendix 1 also displays the country specific scores based on the data analysis previously described in chapter 3.2.

Table 5. Colour coded score difference between country specific average scores with 95% CI (shown as the number which is subtracted from the average to yield the lower ci limit, and is added to the average to yield the higher limit), per dimension and average score across countries. Reference values for the general Australian working population included. Red text marks scores from countries which differ significantly within the same dimension. Colour background category significance: Green (significant difference): indicates a score difference ≥5 points more desirable than the average across countries score. Blue (not significant difference): indicates a score difference <5 points more or less desirable than the average across countries score, making the two scores comparable to each other. Orange (significant difference): indicates a score difference ≥5<10 points less desirable than average. Red (significant difference): indicates a score difference ≥10 points less desirable than average. Red text indicates a significant internal country difference within the dimension.

Dimension	**Reference value** (Rahimi et al. 2025)	**Average across countries score**	**AUS**	**FIN**	**UK**	**NOR**	**SWE**
Emotional demands	40.5	54.8	+4.2 (±6.2)	-2.0 (±5.1)	+5.2 (±5.3)	-9.2 (±5.6)	+1.9 (±3.5)
Work engagement	55.3	60	+5.5 (±4.2)	-0.3 (±5.4)	+5.6 (±4.6)	-5.6 (±4.1)	-5.3 (±3.0)
Work life conflict	40.1	51.8	+6.13 (±6.9)	-11.3 (±7.0)	+8.8 (±9.6)	-13 (±7.6)	+8,7 (±4.4)
Self-related health	57	59.2	+0.6 (±6.8)	+3.3 (±6.6)	-0.6 (±5.9)	+2.9 (±5.9)	+6.8 (±3.8)
Sleeping troubles	44.6	37.4	+8.0 (±7.7)	-6.5 (±6.0)	+5.5 (±8.7)	-4.9 (±6.7)	-2.0 (±4.4)
Burnout	47.6	60.7	+6.5 (±6.3)	-8.1 (±7.0)	+9.2 (±6.8)	-7.5 (±7.0)	-0.1 (±7.7)
Stress	40.2	56	+3.7 (±7.0)	-3.4 (±6.6)	+5.4 (±8.1)	-4.9 (±5.9)	0.0 (±4.2)
Somatic stress	27.0	39.8	+2.7 (±7.4)	-3.2 (±6.7)	+7.1 (±7.6)	-7.0 (±5.2)	+0.4 (±4.0)
Cognitive stress	33.3	52.3	+2.3 (±7.9)	-2.3 (±7.8)	+1.0 (±9.2)	-2.1 (±7.2)	+1.2 (±4.6)
Depressive symptoms	34.7	48.1	-1.4 (±6.8)	-6.4 (±7.6)	+2.9 (±7.5)	-1.6 (±6.5)	+5.7 (±3.9)
Self-efficacy	64.2	54.6	+5.3 (±6.4)	+2.2 (±7.6)	-2.7 (±5.0)	-1.6 (±5.5)	-2.9 (±3.9)
Number of participants		239	37	36	30	40	97
Approximate distribution between countries		100%	15%	15%	13%	17%	40%

As table 5 displays, none of the country specific dimension scores differ more than or equal to 10 points less desirable than the average across countries score. There are however some dimensions where the internal spread is significant between the countries. For example, as marked with red text in table 5:

- Emotional demands: Norway 9.2 points more desirable and the UK 5.2 points less desirable compared to average across countries. In total this equals a **14.4-point difference** between those two countries in this dimension. If accounting for the 95% CI of a total of 10.9, this would make the difference 3.5 points which is not considered significant.
- Work life conflict: Norway 13 points more desirable and the UK 8.8 points less desirable compared to average across countries. In total this equals a **21.8-point difference** between those two countries in this dimension. If accounting for the 95% CI of a total of 17.2, this would make the difference 4.6 points which is not considered significant.
- Sleeping troubles: Finland 6.5 points more desirable and the Australia 8.0 points less desirable compared to average across countries. In total this equals a **14.5-point difference** between those two countries in this dimension. If accounting for the 95% CI of a total of 13.7, this would make the difference 1.2 points which is not considered significant.
- Burnout: Finland 8.1 points more desirable and the UK 9.2 points less desirable compared to average across countries. In total this equals a **17.3-point difference** between those two countries in this dimension. If accounting for the 95% CI of a total of 13.8, this would make the difference 3.5 points which is not considered significant.
- Somatic stress: Norway 7.0 points more desirable and the UK 7.1 points less desirable compared to average across countries. In total this equals a **14.1-point difference** between those two countries in this dimension. If accounting for the 95% CI of a total of 12.8, this would make the difference 1.3 points which is not considered significant.

When looking at table 5, there are no country scores which are 10 or more points less desirable than the average across countries. However, when comparing the individual country dimension scores to the general working population reference scores, there are several country scores which have results more in line with those of table 4 where all the participants were compared to the reference values as one group. When looking at the scores in table 5, there are individual country scores which are more respectively less desirable than the reference scores, in a way which is not shown in table 4. There are only two country dimension scores which are 5 or more points more desirable than the Australian working population reference scores. These are both in the dimension work engagement where Australia (10.2 points) and the UK (10.3 points) reported more desirable results than the reference scores. All other country dimension scores are either comparable to or less desirable than the Australian working population reference values.

Figures 17-20 displays the response distributions for the four potential causes included in the survey. By taking all responses into consideration for the question

regarding potential causes which negatively affect the mental health of the responder, the following can be found for the respective countries:

- Sweden: participants mainly reported “Academic” as affecting their current mental wellbeing negatively.
- Norway: participants mainly reported “Academic” as affecting their current mental wellbeing negatively.
- Finland: participants mainly reported “Transitional” as affecting their current mental wellbeing negatively.
- The UK: participants mainly reported “Academic” as affecting their current mental wellbeing negatively.
- Australia: participants mainly reported “Academic” as affecting their current mental wellbeing negatively.

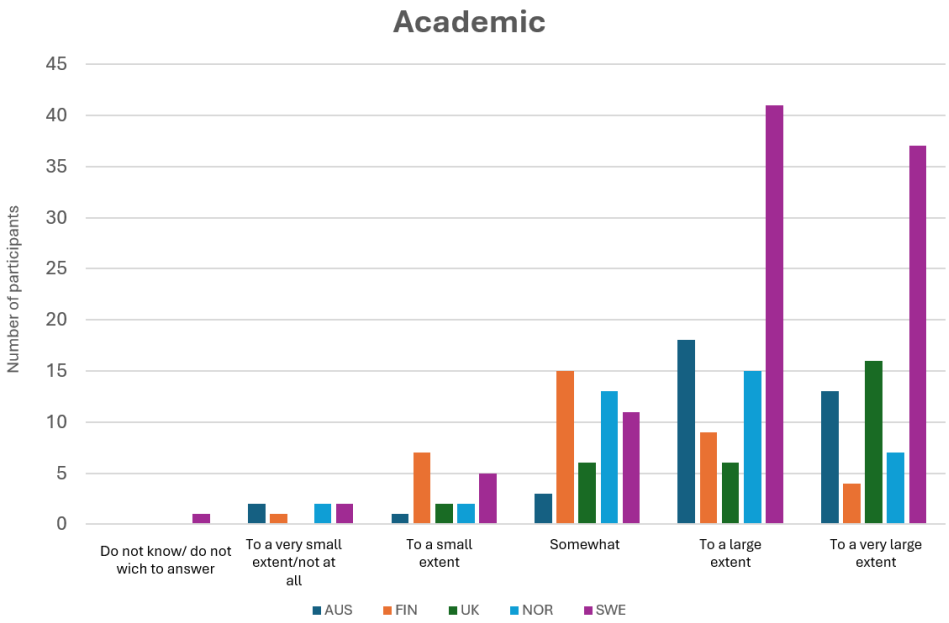

*Figure 17. Country response distribution to the question "In your own experience and opinion, how much do the following areas negatively affect your current mental wellbeing?" and the response option “**Academic** (e.g., large workload, difficult content, faculty expectations, competition”.*

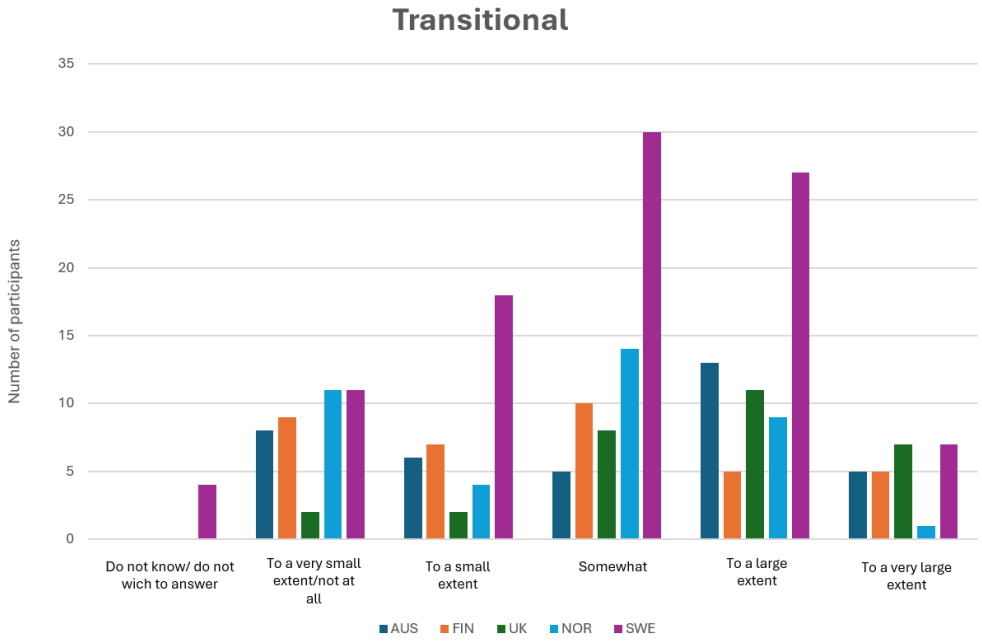

*Figure 18. Country response distribution to the question "In your own experience and opinion, how much do the following areas negatively affect your current mental wellbeing?" and the response option "**Transitional** (e.g., moving from secondary education/to clinical years, transport, financial difficulties, social interactions)".*

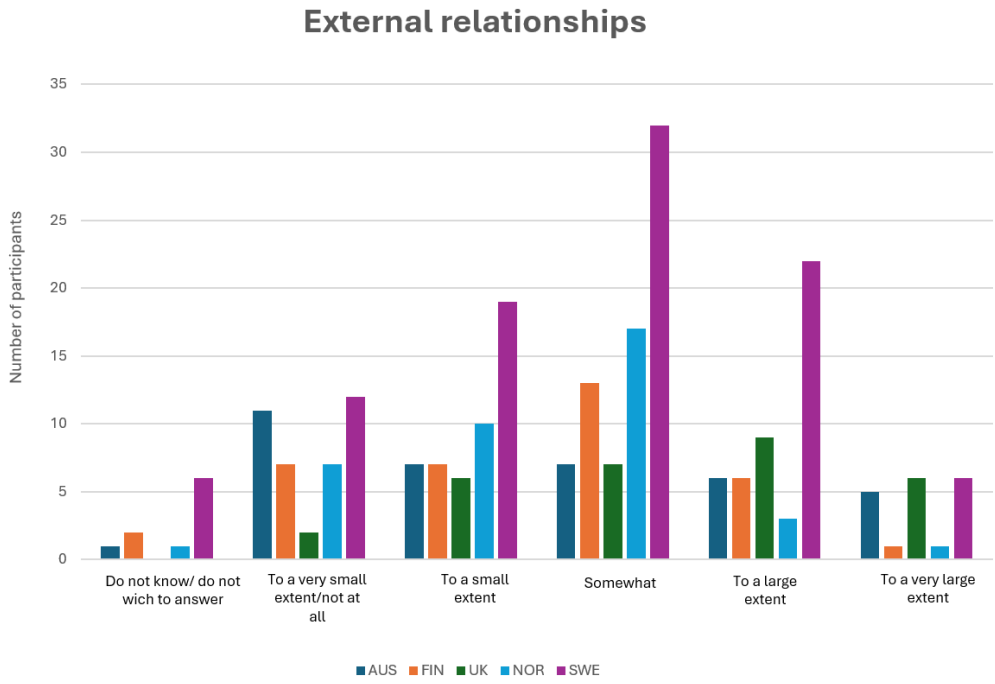

*Figure 19. Country response distribution to the question "In your own experience and opinion, how much do the following areas negatively affect your current mental wellbeing?" and the response option "**External relationships** (e.g. family illness/death, partner/marriage relationship difficulties)".*

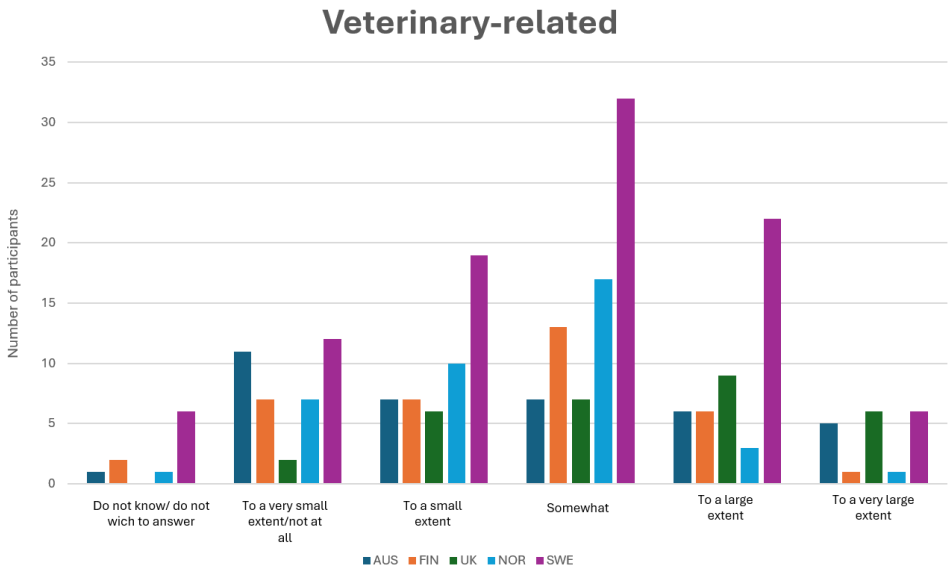

*Figure 20. Country response distribution to the question "In your own experience and opinion, how much do the following areas negatively affect your current mental wellbeing?" and the response option "**Veterinary-related** (e.g., long working hours, ethical dilemmas, difficult animal–client interactions, euthanasia)".*

5. Discussion

5.1 Comparison of general results

The aim of this study was to investigate whether veterinary students in different countries with similar educational structures experience psychosocial stressors, to what extent and how this data varies between the selected countries. Figures 5-16 show the distribution of the collective responses from all the participants in the survey per question in each dimension. While interpreting these figures, note that since the figures are based on all the responses together, the countries with the highest number of participants are proportionally overrepresented compared to those with the lowest number of participants. Since the first question at issue in this project was what the current psychosocial wellbeing looks like for veterinary medicine students in all the selected countries combined, using this average across all participants is relevant. Thus, all participants were interpreted as one group to be compared to existing reference scores in this chapter.

As table 4 shows, the average scores across all participants in this survey are continuously reported as less desirable than the general reference scores and the reference scores for occupational group “other healthcare professionals”. For only one out of the 11 dimension scores, sleeping troubles, the point estimate indicates better psychosocial wellbeing among the veterinary students compared to the available reference scores. However, if one takes the 95% confidence interval into consideration for this veterinary students estimate, the interval includes the estimate for available reference score, thus suggesting that survey result are in fact comparable to the reference score. In other words, this point estimate indicates an apparent difference, yet statistical test fails to stand significant. Two dimensions scores, work engagement and self-related health, are reported as comparable to the general reference scores. These are small exceptions to the general conclusion that the participating veterinary students Sweden, Norway, Finland, the UK and Australia (when comparing the average score across all participants) report worse psychosocial wellbeing than the reference groups in eight of the 11 dimensions. Out of these eight dimensions, all of them have a score more than 10 points less desirable than the reference.

Referring to information from table 3, when it comes to the dimension burnout COPSOQ focuses on the degree of both physical and mental fatigue and exhaustion for the responder. It is mentioned that an increased degree of burnout is connected to several troubling consequences such as increased absence, sleeping troubles, depressive symptoms, risk of heart disease and increased mortality. Because of this as well as considering the alarming average of 60.3 points in this dimension for the participants compared to the average of 47.6 and 24.3 points for the reference groups, the author views this as one of the most startling findings.

The dimensions stress and cognitive stress are similar in the way that it is the elevated level of stress over a long period of time which is harmful for quality of life, work effort and health (Burr et al. 2019). Since both these dimensions have scores of 15-20 points over the general working population reference group, and stress almost 30 points over the more specific occupational reference group, these findings are also to be included among the most alarming results from this survey. Note that table 4 shows that seven of the eight red category score differences would, even when taking the 95% CI into account, remain in the red category meaning a score more than ≥10 points less desirable than average. This strengthens the conclusion that these results are significant from medical and wellbeing perspectives. Another strengthening factor to the survey results is the alignment to the reported prevalence in the scientific literature cited in chapter 2.2, where many articles report veterinary students experiencing low mental health and high levels of stress, burnout and depressive symptoms (e.g. Reisbig et al. 2012; Cardwell et al. 2013; Nahar et al. 2019; SLUSS 2024).

Regarding the result of the survey question "Potential causes" (chapter 4.2 and figures 17a-d), one area stood out as most frequently reported as having a negative effect on the responder's mental health. This area was academic (e.g., large workload, difficult content, faculty expectations, competition) which when asked "*In your own experience and opinion, how much do the following areas negatively affect your current mental wellbeing?*" yielded a response of 32.2% "To a very large extent" and 37.2% "To a large extent" among all the participants in the survey. This result is supported by the literature formerly cited in chapter 2.2, which indicate that the academic demands of the veterinary education causes stress for many veterinary students (Cardwell & Lewis 2017; Liu & van Gelderen 2020; SLUSS 2024). Future research should preferably focus on further investigating the academic area to identify factors that may aid in adjusting curriculum load, students' expectations and coping mechanisms.

The area of potential cause which was least reported as having a negative effect on the responder's current mental health was external relationships (e.g. family illness/death, partner/marriage relationship difficulties). Compared to the academic area, external relationships have the responses 8.4% "To a very large extent" and 18.4% "To a large extent". The importance of healthy and supportive relationships for a person's mental health has been lifted in the literature as an important protecting factor (Thoits 2011; Hafen et al. 2013). One possible explanation for the promising reports regarding external relationships in this study, is the life stage of most survey participants. The most common age group was 20-25 years old as shown in figure 1. This could indicate that many participants are yet to start a family or having to care for elderly parents, something which naturally could have a straining or negative effect on their mental health. If following this

reasoning, the low report of external relationships having a negative effect on the participants' mental health would be expected.

It is relevant to look to the general mental health in the participating countries when interpreting the survey results. As mentioned in chapter 2.1 and 2.2, the mental health of veterinarians and veterinary medicine students has previously been reported as an area of concern in all participating countries: Sweden (eg. Hagevi et al. 2024, SLUSS 2024), Norway (eg. Dalum et al. 2024), Finland (eg. Reijula et al. 2003), the UK (eg. Bartram et al. 2009; Cardwell et al. 2013) and Australia (eg. Hatch et al. 2011; Harvey et al. 2017), which strengthens findings of this study.

5.2 Comparison of country specific results

A large part of this project aimed to investigate the comparison between the current psychosocial wellbeing and mental health of veterinary students in the selected countries. As previously shown in figure 3, the number of participants in this survey varied greatly between countries yielding in a ratio between 0 and more than 40%. To compensate for this fact and to acquire a fairer comparison between the countries in this chapter, an average across countries score was calculated, as shown in table 4 and explained in chapter 3.2. The average score across all participants is naturally dominated by the Swedish participants responses, as they represent more than 40% of the total responses, while the less than 13% responses from the UK would not be sufficiently represented. Sweden does not have three times as many veterinary medicine students as the UK, but rather the opposite as the UK currently has 11 active VEEs and Sweden only has one VEE. Hence this average across countries calculation effort has been made to more realistically reflect the real-life ratio.

Table 5 is based on the information from appendix 1, but with the differences between the country specific dimension scores and the average across countries score in different colour categories to facilitate understanding of the country specific scores in relation to the average scores. Note that since a high score can either be desirable or not desirable, it is not possible to use an average score per country over all dimensions to compare the countries to each other.

In other words, even though there are several significant internal score differences withing the countries, only one of these differences remained statistically significant when taking the 95% confidence interval into measurement. That dimension is burnout, which in table 4 was shown to be one of the dimensions with the largest contrast to the available reference scores.

When looking at table 5, the results can be summarized in the following ranking ranging from the most to the least number of desirable dimension scores:

1. Finland: 4 dimensions better than average across countries and 0 dimensions worse. 7 dimensions comparable.

2. Norway: 4 dimensions better than average across countries and one dimension worse. 6 dimensions comparable.
3. Australia: 2 dimensions better than average across countries and 3 dimensions worse. 6 scores comparable.
4. Sweden: 0 dimensions better than average across countries and 4 dimensions worse. 7 dimensions comparable.
5. The UK: 1 dimension better than average across countries and 6 dimensions worse. 4 dimensions comparable.

The reader is encouraged to note that for all countries except for the UK in above list, the majority of the dimension scores are comparable to the average across countries score. However, as mentioned in chapter 4.3 and displayed in table 5, there are some score differences between the countries within the same dimensions which stand out. Because the 95% confidence intervals for the country dimension scores are relatively wide, when it is taken into consideration while calculating the differences no comparisons remain significant according to COPSOQ. The dimension with the second largest internal score difference is work life conflict. Norway reported a score 13 points more desirable and the UK a score 8.8 points less desirable compared to average across countries. In total this equals a 21.8-point difference between those two countries in this dimension. And if accounting for the 95% CI of a total of 17.2, this would make the difference 4.6 points which is not considered significant but relatively close to the 5–10-point significance level. When analysing all other internal score differences per dimension in table 5, and adding the factor of the 95% CI, no other differences are larger than 5 points.

The question regarding a potential cause which is affecting the responder's current mental health differently, figures 17-20 display a common theme. All countries apart from Finland mainly reported "Academic (e.g., large workload, difficult content, faculty expectations, competition" as the main potential cause. The Finnish participants on the other hand, mainly reported "Transitional (e.g., moving from secondary education/to clinical years, transport, financial difficulties, social interactions)" as a potential cause. This is an interesting find considering that Finland had the most amount of dimension scores which were more desirable than the average.

When it comes to the comparison of the country specific results from this survey and attempts to discuss the potential explanations for them, it is of relevance to highlight what the different countries' vet programs have in common and what makes them different from each other. For this study, a small number of countries were selected for this project to ensure that it was kept at a reasonable size for the time frame provided. The countries in question (Sweden, Denmark, Norway, Finland, the UK and Australia) have similar education structures although not

identical. Sweden and Norway have many similarities within their 5.5-year veterinary medicine programs, as well as Finland although they provide a 6-year veterinary medicine program. One noteworthy difference between the Nordic countries and the UK and Australia is the matter of tuition. Domestic veterinary students in the UK and Australia are required to pay a tuition while veterinary students with EU nationality in the Nordic countries do not. For example, the total cost of the full Bachelor of Science/Doctor of Veterinary Medicine program at Murdoch University in Perth, WA amounts to $352,482 AUD (Murdoch University n.d.b). Another example of tuition is the Bachelor of Veterinary Science program at Bristol University which has a total cost of £46,250 for domestic students. Comparingly, the equivalent fee for international students is £203,500 (Bristol n.d.).

5.3 Use of results and future research

There are strengths as well as limitations to this study. In the authors opinion, the most significant limitation is the number of students participating in the survey. As shown in table 3, the response rates per country varied from 0% to 26.3% of the equivalent student population. The low response rate affects the representtativity of the study findings. Something to also take into consideration, is that participating in this survey was 100% voluntary. It is possible that those veterinary medicine students who identify with low mental health and psychosocial wellbeing were more inclined to participate, which would lead to a selection bias in the sample population. For example, the UK participants reported some of the least desirable scores in this survey, while simultaneously having the lowest response rate.

Another limiting factor is the reference values. The values chosen for the comparisons made in chapter 4.2 are from two sources. The general working populartion reference scores are from an Australian article currently under peer review (Rahimi et al. 2025). While the fact that the reference values are recent is to be seen as a strength, the fact that the article is not yet approved is a potential limitation. While the reference values for the group “other healthcare professionals” are highly relevant in order to compare the survey results to a similar reference group, these scores are sourced only from Swedish COPSOQ III articles and are not available for all the dimensions chosen for this survey.

It is important to note that the selection of countries for this project are potential bases to an Anglo-Saxon and morewhat northern European bias. Hence, any direct conclusions drawn from this project regarding the worldwide veterinary student population is discouraged. It would be of interest to compare the results from this study to future research including participating countries from parts of the world not represented in this project such as Asia, the middle east, the Pacific,

Africa and the Americas. The limitations discussed in this chapter makes drawing definite conclusions something which should be done with caution.

With the previously mentioned data as a background, what measures and changes does the literature suggest as necessary to minimize the common stressors for veterinary students, and thereby improving the students' mental health? Several articles have been written on this subject. For example, Stetina & Krouzecky (2022) suggested that a focus on teaching the students communication techniques could be a base for improving their future professional life and decrease the burden of veterinarians. Another article by Dow et al. (2019) highlights the importance of teaching about grief as a method of helping veterinary students deal with their own reactions and feelings associated with grief which is not uncommon within the veterinary profession. Promoting positive aspects of the profession was also mentioned as being of importance along with developing the veterinary students' abilities to apply universal principles to ethical dilemmas to avoid internal moral stress. Holden (2020) suggested that the student's well-being would be positively impacted by teaching strategies to help students develop healthy ways to set and pursue goals, promote resilience and manage perfectionism in a high-pressure environment such at the veterinary education and profession. Policies and programs which foster relationship-building such as student unions and clubs is also highly encouraged in the same article by Holden.

6. Conclusions

In conclusion, the results from this survey support the existing literature regarding the low psychosocial wellbeing among veterinary students in all participating countries. Some internal dimension differences can be noted between the countries Sweden, Norway, Finland, the UK and Australia, but most of the results align with a general low psychosocial wellbeing among the veterinary medicine students. More research is needed on the subject, for example what parts of the academic life that the students find most troubling and which differences regarding education that play a part in the overall psychosocial wellbeing of the veterinary medicine students. In a future survey based study, efforts should be made to obtain a high response rate among the students for better representation.

References

American Veterinary Medical Association (n.d.). *Veterinarians: Protecting the health of animals and people.* https://www.avma.org/resources/pet-owners/yourvet/veterinarians-protecting-health-animals-and-people [2024-10-28]

Bartram, D. & Boniwell, I. (2007). The science of happiness: achieving sustained psychological wellbeing. *In Practice*, 29 (8), 478–482. https://doi.org/10.1136/inpract.29.8.478

Bartram, D.J. & Baldwin, D.S. (2010). Veterinary surgeons and suicide: a structured review of possible influences on increased risk. *The Veterinary Record*, 166 (13), 388–397. https://doi.org/10.1136/vr.b4794

Bartram, D.J., Yadegarfar, G. & Baldwin, D.S. (2009). Psychosocial working conditions and work-related stressors among UK veterinary surgeons. *Occupational Medicine*, 59 (5), 334–341. https://doi.org/10.1093/occmed/kqp072

Basudan, S., Binanzan, N. & Alhassan, A. (2017). Depression, anxiety and stress in dental students. *International Journal of Medical Education*, 8, 179–186. http://doi.org/10.5116/ijme.5910.b961

Baumeister, R.F. & Leary, M.R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, 117 (3), 497–529. https://doi.org/10.1037/0033-2909.117.3.497

Baumeister, S.E., Schomerus, G., Schmidt, C.-O., Möckel, F., van den Berg, N., Hoffmann, W., Völzke, H. & Grabe, H.J. (2015). Change in depressive symptoms and mental health-related quality of life in northeast Germany between 1997-2001 and 2008-2012. *International Journal of Public Health*, 60 (1), 33–39. https://doi.org/10.1007/s00038-014-0632-0

Berthelsen, H., Westerlund, H., Bergström, G. & Burr, H. (2020). Validation of the Copenhagen Psychosocial Questionnaire Version III and establishment of benchmarks for psychosocial risk management in Sweden. *International Journal of Environmental Research and Public Health*, 17 (9), 3179. https://doi.org/10.3390/ijerph17093179

Blair, A. & Hayes Jr., H.M. (1980). Cancer and other causes of death among U.S. veterinarians, 1966–1977. *International Journal of Cancer*, 25 (2), 181–185. https://doi.org/10.1002/ijc.2910250203

Bos, D. (2022). Compassion fatigue: A hidden danger to veterinary professionals. *Not One More Vet*. https://www.nomv.org/2022/10/18/compassion-fatigue-a-hidden-danger-to-veterinary-professionals/ [2024-10-28]

Burr, H., Berthelsen, H., Moncada, S., Nübling, M., Dupret, E., Demiral, Y., Oudyk, J., Kristensen, T.S., Llorens, C., Navarro, A., Lincke, H.-J., Bocéréan, C., Sahan, C., Smith, P. & Pohrt, A. (2019). The third version of the Copenhagen Psychosocial Questionnaire. *Safety and Health at Work*, 10 (4), 482–503. https://doi.org/10.1016/j.shaw.2019.10.002

Cake, M.A., McArthur, M.M., Matthew, S.M. & Mansfield, C.F. (2017). Finding the balance: Uncovering resilience in the veterinary literature. *Journal of Veterinary Medical Education*, 44 (1), 95–105. https://doi.org/10.3138/jvme.0116-025R

Cardwell, J.M. & Lewis, E.G. (2017). Vocation, Belongingness, and balance: A qualitative study of veterinary student well-being. *Journal of Veterinary Medical Education*, 44 (1), 29–37. https://doi.org/10.3138/jvme.0316-055R

Cardwell, J.M., Lewis, E.G., Smith, K.C., Holt, E.R., Baillie, S., Allister, R. & Adams, V.J. (2013). A cross-sectional study of mental health in UK veterinary undergraduates. *Veterinary Record*, 173 (11), 266–266. https://doi.org/10.1136/vr.101390

Champagne, S. (2018). Vétérinaires en détresse. *La Presse+*. https://plus.lapresse.ca/screens/70d0d375-28ba-47c5-9599-51e42a8d016a|_0.html [2024-10-28]

Chew-Graham, C.A., Rogers, A. & Yassin, N. (2003). 'I wouldn't want it on my CV or their records': medical students' experiences of help-seeking for mental health problems. *Medical Education*, 37 (10), 873–880. https://doi.org/10.1046/j.1365-2923.2003.01627.x

Copenhagen University (n.d.). *Bachelor of Veterinary Medicine (BVetMed)*. Faculty of Health and Medical Sciences. 2009-studieordning for bacheloruddannelsen i veterinærmedicin. https://www.ku.dk/fileadmin/site-2596/Studieordninger/SUND/Veterinaermedicin/Veterinaermedicin_BA_2009.pdf ?1773911681

COPSOQ International Network (n.d.). *Licence, Guidelines & Questionnaire.* https://www.copsoq-network.org/licence-guidelines-and-questionnaire/ [2024-12-06]

COPSOQ Sverige (n.d.a). *Skapa egna diagram.* https://copsoq.se/diagram/skapa-egna-profildiagram [2024-11-19]

COPSOQ Sverige (n.d.b). *Tolkning av resultat.* https://copsoq.se/arbetsplatsundersokning/tolkning-av-resultat [2024-11-19]

COPSOQ Sverige (n.d.c). *Jämförande diagram.* https://copsoq.se/diagram/jamforande-diagram#cT1FRF9TVyZwPUlTQ08mbz03NyZmPTQ= [2024-11-22]

Dalum, H.S., Hem, E., Ekeberg, Ø., Reneflot, A., Stene-Larsen, K. & Hauge, L.J. (2024). Suicide rates among health-care professionals in Norway 1980–2021. *Journal of Affective Disorders*, 355, 399–405. https://doi.org/10.1016/j.jad.2024.03.128

van Dijk, I., Lucassen, P.L.B.J., van Weel, C. & Speckens, A.E.M. (2017). A cross-sectional examination of psychological distress, positive mental health and their predictors in medical students in their clinical clerkships. *BMC Medical Education*, 17 (1), 219. https://doi.org/10.1186/s12909-017-1035-8

Dow, M., Chur-Hansen, A., Hamood, W. & Edwards, S. (2019). Impact of dealing with bereaved clients on the psychological wellbeing of veterinarians. *Australian Veterinary Journal*, 97 (10), 382–389. https://doi.org/10.1111/avj.12842

Economou, M., Madianos, M., Peppou, L.E., Patelakis, A. & Stefanis, C.N. (2013). Major depression in the Era of economic crisis: A replication of a cross-sectional study across Greece. *Journal of Affective Disorders*, 145 (3), 308–314. https://doi.org/10.1016/j.jad.2012.08.008

Fink-Miller, E.L. & Nestler, L.M. (2018). Suicide in physicians and veterinarians: risk factors and theories. *Current Opinion in Psychology*, 22, 23–26. https://doi.org/10.1016/j.copsyc.2017.07.019

Foa, R.S., Gilbert, S. & Fabian, M. (2020). *COVID-19 and Subjective Well-Being: Separating the Effects of Lockdowns from the Pandemic.* Bennett Institute for Public Policy, University of Cambridge. https://doi.org/10.17863/CAM.90181

Fox, F.E., Doran, N.J., Rodham, K.J., Taylor, G.J., Harris, M.F. & O'Connor, M. (2011). Junior doctors' experiences of personal illness: a qualitative study. *Medical Education*, 45 (12), 1251–1261. https://doi.org/10.1111/j.1365-2923.2011.04083.x

Fullana, M.A. & Littarelli, S.A. (2021). Covid-19, anxiety, and anxiety-related disorders. *European Neuropsychopharmacology*, 51, 87. https://doi.org/10.1016/j.euroneuro.2021.05.008

Goldney, R.D., Eckert, K.A., Hawthorne, G. & Taylor, A.W. (2010). Changes in the prevalence of major depression in an Australian community sample between 1998 and 2008. *Australian & New Zealand Journal of Psychiatry*, 44 (10), 901–910. https://doi.org/10.3109/00048674.2010.490520

Gonda, X. & Tarazi, F.I. (2021). Well-being, resilience and post-traumatic growth in the era of Covid-19 pandemic. *European Neuropsychopharmacology*, 54, 65. https://doi.org/10.1016/j.euroneuro.2021.08.266

Hafen, M., Ratcliffe, G.C. & Rush, B.R. (2013). Veterinary medical student well-being: depression, stress, and personal relationships. *Journal of Veterinary Medical Education*, 40 (3), 296–302. https://doi.org/10.3138/jvme.1112-101R

Hagevi, O., Olsson, A. & Jansson, B. (2024). The psychological wellbeing within the veterinary profession in Sweden. *Journal of Workplace Behavioral Health*, 39 (3), 275–287. https://doi.org/10.1080/15555240.2024.2328074

Hart, L. (2014). Attachment to pets: An integrative view of human–animal relationships with implications for therapeutic practice. *Anthrozoös*, 27 (4), 626–628. https://doi.org/10.2752/089279314X14117221853976

Hartnack, S., Springer, S., Pittavino, M. & Grimm, H. (2016). Attitudes of Austrian veterinarians towards euthanasia in small animal practice: impacts of age and gender on views on euthanasia. *BMC Veterinary Research*, 12 (1), 26. https://doi.org/10.1186/s12917-016-0649-0

Harvey, S.B., Deady, M., Wang, M.-J., Mykletun, A., Butterworth, P., Christensen, H. & Mitchell, P.B. (2017). Is the prevalence of mental illness increasing in Australia? Evidence from national health surveys and administrative data, 2001–2014. *Medical Journal of Australia*, 206 (11), 490–493. https://doi.org/10.5694/mja16.00295

Hatch, P., Winefield, H., Christie, B. & Lievaart, J. (2011). Workplace stress, mental health, and burnout of veterinarians in Australia. *Australian Veterinary Journal*, 89 (11), 460–468. https://doi.org/10.1111/j.1751-0813.2011.00833.x

Hawton, K., Agerbo, E., Simkin, S., Platt, B. & Mellanby, R.J. (2011a). Risk of suicide in medical and related occupational groups: A national study based on Danish case population-based registers. *Journal of Affective Disorders*, 134 (1), 320–326. https://doi.org/10.1016/j.jad.2011.05.044

Hawton, K., Agerbo, E., Simkin, S., Platt, B. & Mellanby, R.J. (2011b). Risk of suicide in medical and related occupational groups: A national study based on Danish case population-based registers. *Journal of Affective Disorders*, 134 (1), 320–326. https://doi.org/10.1016/j.jad.2011.05.044

Hem, E., Haldorsen, T., Aasland, O.G., Tyssen, R., Vaglum, P. & Ekeberg, Ø. (2005). Suicide rates according to education with a particular focus on physicians in Norway 1960–2000. *Psychological Medicine*, 35 (6), 873–880. https://doi.org/10.1017/S0033291704003344

Hritzkowin, O. (2023). Gauging clientele knowledge on alternative methods of payment for veterinary services in relation to client satisfaction. *Honors College Theses*,. https://digitalcommons.murraystate.edu/honorstheses/178

IVSA (n.d.). *Who We Are.* International Veterinary Students Association. https://ivsa.org/who-we-are [2024-09-17]

Jones-Fairnie, H., Ferroni, P., Silburn, S. & Lawrence, D. (2008). Suicide in Australian veterinarians. *Australian Veterinary Journal*, 86 (4), 114–116. https://doi.org/10.1111/j.1751-0813.2008.00277.x

Kanazawa, F.K. & Cotrim, T.P. (2021). Assessment of Psychosocial Risk Factors at Work: A Literature Review on the COPSOQ Evolution. In: Black, N.L., Neumann, W.P., & Noy, I. (eds.) *Proceedings of the 21st Congress of the International Ergonomics Association (IEA 2021)*. Lecture Notes in Networks and Systems, 219, 695–703. Springer International Publishing, Cham. https://doi.org/10.1007/978-3-030-74602-5_95

Killinger, S.L., Flanagan, S., Castine, E. & Howard, K.A.S. (2017). Stress and depression among veterinary medical students. *Journal of Veterinary Medical Education*, 44 (1), 3–8. https://doi.org/10.3138/jvme.0116-018R1

Kipperman, B.S., Kass, P.H. & Rishniw, M. (2017). Factors that influence small animal veterinarians' opinions and actions regarding cost of care and effects of economic limitations on patient care and outcome and professional career satisfaction and burnout. *Journal of the American Veterinary Medical Association*, 250 (7), 785-794. https://doi.org/10.2460/javma.250.7.785

Laura, L., Arapović, M., Duvnjak, S. & Arapović, J. (2024). Empathy and mental health in veterinary medicine. *Veterinary Research Communications*, 48 (4), 1991–1997. https://doi.org/10.1007/s11259-024-10385-1

Lincke, H.-J., Vomstein, M., Lindner, A., Nolle, I., Häberle, N., Haug, A. & Nübling, M. (2021). COPSOQ III in Germany: validation of a standard instrument to measure

psychosocial factors at work. *Journal of Occupational Medicine and Toxicology*, 16 (1), 50. https://doi.org/10.1186/s12995-021-00331-1

Liu, A.R. & van Gelderen, I.F. (2020). A systematic review of mental health–improving interventions in veterinary students. *Journal of Veterinary Medical Education*, 47 (6), 745–758. https://doi.org/10.3138/jvme.2018-0012

Markkula, N., Zitko, P., Peña, S., Margozzini, P. & Retamal C., P. (2017). Prevalence, trends, correlates and treatment of depression in Chile in 2003 to 2010. *Social Psychiatry and Psychiatric Epidemiology*, 52 (4), 399–409. https://doi.org/10.1007/s00127-017-1346-4

Mastenbroek, N.J.J.M. (2017). The art of staying engaged: The role of personal resources in the mental well-being of young veterinary professionals. *Journal of Veterinary Medical Education*, 44 (1), 84–94. https://doi.org/10.3138/jvme.0216-041R1

McArthur, M.L., Matthew, S.M., Brand, C.P.B., Andrews, J., Fawcett, A. & Hazel, S. (2019). Cross-sectional analysis of veterinary student coping strategies and stigma in seeking psychological help. *Veterinary Record*, 184 (23), 709–709. https://doi.org/10.1136/vr.105042

Mckevitt, C. & Morgan, M. (1997). Illness doesn't belong to us. *Journal of the Royal Society of Medicine*, 90 (9), 491–495. https://doi.org/10.1177/014107689709000907

Mellanby, R.J. (2005). Incidence of suicide in the veterinary profession in England and Wales. *Veterinary Record*, 157 (14), 415–417. https://doi.org/10.1136/vr.157.14.415

Murdoch University (n.d.a). *Bachelor of Science / Doctor of Veterinary Medicine.* https://www.murdoch.edu.au/course/undergraduate/b1402 [2024-10-15]

Murdoch University (n.d.b) *Fee Calculator*. https://handbook.murdoch.edu.au/fees/course-options [2024-11-18]

Nahar, V.K., Davis, R.E., Dunn, C., Layman, B., Johnson, E.C., Dascanio, J.J., Johnson, J.W. & Sharma, M. (2019). The prevalence and demographic correlates of stress, anxiety, and depression among veterinary students in the Southeastern United States. *Research in Veterinary Science*, 125, 370–373. https://doi.org/10.1016/j.rvsc.2019.07.007

Nett, R.J., Witte, T.K., Holzbauer, S.M., Elchos, B.L., Campagnolo, E.R., Musgrave, K.J., Carter, K.K., Kurkjian, K.M., Vanicek, C.F., O'Leary, D.R., Pride, K.R. & Funk, R.H. (2015). Risk factors for suicide, attitudes toward mental illness, and practice-related stressors among US veterinarians. *Journal of the American Veterinary Medical Association*, 247 (8), 945–955. https://doi.org/10.2460/javma.247.8.945

NMBU (n.d.). *Veterinary Science.* Norwegian University of Life Sciences. https://www.nmbu.no/en/studies/phd/veterinary-science [2024-10-29]

Not One More Vet (n.d.). *Home.* https://www.nomv.org/ [2024-10-31]

O'Connor, R.C. (2011). The integrated motivational-volitional model of suicidal behavior. *Crisis*, 32 (6), 295–298. https://doi.org/10.1027/0227-5910/a000120

OECD (2017). *Antidepressant drugs consumption, 2000 and 2015 (or nearest year)*. Organisation for Economic Co-operation and Development. https://www.oecd-ilibrary.org/social-issues-migration-health/health-at-a-glance-2017/antidepressant-drugs-consumption-2000-and-2015-or-nearest-year_health_glance-2017-graph181-en [2024-10-30]

OTIS (2023). Working as a Veterinarian or Veterinarian Technician. In: *Mother to Baby* [Fact Sheets]. Organization of Teratology Information Specialists. http://www.ncbi.nlm.nih.gov/books/NBK583025/ [2024-10-28]

Ozkurt Kayahan, Z., Cabbar, F., özçakır tomruk, C. & Dolekoglu, S. (2017). Evaluation of depression levels of dental students. *Biomedical Research (India)*, 28, 3318–3321

Park, J.E., Lee, J.-Y., Sohn, J.H., Seong, S. jeong & Cho, M.J. (2015). Ten-year trends in the prevalence and correlates of major depressive disorder in Korean near-elderly adults: a comparison of repeated nationwide cross-sectional studies from 2001 and 2011. *Social Psychiatry and Psychiatric Epidemiology*, 50 (9), 1399–1406. https://doi.org/10.1007/s00127-015-1059-5

Patten, S.B., Williams, J.V.A., Lavorato, D.H., Wang, J.L., McDonald, K. & Bulloch, A.G.M. (2016). Major depression in Canada: What has changed over the past 10 years? *Canadian Journal of Psychiatry. Revue Canadienne De Psychiatrie*, 61 (2), 80–85. https://doi.org/10.1177/0706743715625940

Platt, B., Hawton, K., Simkin, S. & Mellanby, R.J. (2010). Systematic review of the prevalence of suicide in veterinary surgeons. *Occupational Medicine*, 60 (6), 436–446. https://doi.org/10.1093/occmed/kqq044

Platt, B., Hawton, K., Simkin, S. & Mellanby, R.J. (2012). Suicidal behaviour and psychosocial problems in veterinary surgeons: A systematic review. *Social Psychiatry and Psychiatric Epidemiology*, 47 (2), 223–240. https://doi.org/10.1007/s00127-010-0328-6

Public Health Agency of Sweden (2022). *Mental health.* https://www.folkhalsomyndigheten.se/the-public-health-agency-of-sweden/living-conditions-and-lifestyle/mental-health/ [2024-10-30]

Rahimi, M., Arnold, B., LaMontagne, A.D. & Riley, P. (2025). Validation and benchmarks for the Copenhagen Psychosocial Questionnaire (COPSOQ III) in an Australian working population sample. *BMC Public Health*, 25, 830. https://doi.org/10.1186/s12889-025-21845-x

Recchi, E., Ferragina, E., Helmeid, E., Pauly, S., Safi, M., Sauger, N. & Schradie, J. (2020). The “Eye of the Hurricane” paradox: An unexpected and unequal rise of well-being during the Covid-19 lockdown in France. *Research in Social Stratification and Mobility*, 68, 100508. https://doi.org/10.1016/j.rssm.2020.100508

Reijula, K., Räsänen, K., Hämäläinen, M., Juntunen, K., Lindbohm, M.-L., Taskinen, H., Bergbom, B. & Rinta-Jouppi, M. (2003). Work environment and occupational

health of Finnish veterinarians. *American Journal of Industrial Medicine*, 44 (1), 46–57. https://doi.org/10.1002/ajim.10228

Reisbig, A.M.J., Danielson, J.A., Wu, T.-F., Hafen, M., Krienert, A., Girard, D. & Garlock, J. (2012). A study of depression and anxiety, general health, and academic performance in three cohorts of veterinary medical students across the first three semesters of veterinary school. *Journal of Veterinary Medical Education*, 39 (4), 341–358. https://doi.org/10.3138/jvme.0712-065R

Richter, D., Wall, A., Bruen, A. & Whittington, R. (2019). Is the global prevalence rate of adult mental illness increasing? Systematic review and meta-analysis. *Acta Psychiatrica Scandinavica*, 140 (5), 393–407. https://doi.org/10.1111/acps.13083

Rosário, S., Azevedo, L.F., Fonseca, J.A., Nienhaus, A., Nübling, M. & da Costa, J.T. (2017). The Portuguese long version of the Copenhagen Psychosocial Questionnaire II (COPSOQ II) – a validation study. *Journal of Occupational Medicine and Toxicology*, 12 (1), 24. https://doi.org/10.1186/s12995-017-0170-9

Ruud, N., Løvseth, L.T., Isaksson Ro, K. & Tyssen, R. (2020). Comparing mental distress and help-seeking among first-year medical students in Norway: results of two cross-sectional surveys 20 years apart. *BMJ open*, 10 (8), e036968. https://doi.org/10.1136/bmjopen-2020-036968

Schwerdtfeger, K.A., Bahramsoltani, M., Spangenberg, L., Hallensleben, N. & Glaesmer, H. (2020). Depression, suicidal ideation and suicide risk in German veterinarians compared with the general German population. *The Veterinary Record*, 186 (15), e2. https://doi.org/10.1136/vr.105430

Silva, V., Costa, P., Pereira, I., Faria, R., Salgueira, A.P., Costa, M.J., Sousa, N., Cerqueira, J.J. & Morgado, P. (2017). Depression in medical students: insights from a longitudinal study. *BMC Medical Education*, 17 (1), 184. https://doi.org/10.1186/s12909-017-1006-0

Skegg, K., Firth, H., Gray, A. & Cox, B. (2010). Suicide by occupation: Does access to means increase the risk? *Australian & New Zealand Journal of Psychiatry*, 44 (5), 429–434. https://doi.org/10.3109/00048670903487191

Skipper, G.E. & Williams, J.B. (2012). Failure to acknowledge high suicide risk among veterinarians. *Journal of Veterinary Medical Education*, 39 (1), 79–82. https://doi.org/10.3138/jvme.0311.034R

SLU (2022). *Utbildningsplan Veterinärprogrammet (giltig från ht 2024)*. Sveriges lantbruksuniversitet. Programnämnden för utbildning inom veterinärmedicin och husdjursvetenskap (SLU.ua.2022.3.1.1-2283). https://earchive.slu.se/server/api/core/bitstreams/8a42a2a8-09bd-46c4-9f86-56596059fd2b/content

Thoits, P.A. (2011). Mechanisms linking social ties and support to physical and mental health. *Journal of Health and Social Behavior*, 52 (2), 145–161. https://doi.org/10.1177/0022146510395592

University of Bristol (n.d.). *BVSc Veterinary Science.* https://www.bristol.ac.uk/study/undergraduate/2025/vet-science/bvsc-veterinary-science/ [2024-11-18]

University of Helsinki (n.d.). *Degree programmes in veterinary medicin*e. Faculty of Veterinary Medicine. https://www.helsinki.fi/en/faculty-veterinary-medicine/teaching-and-studying/degree-programmes-veterinary-medicine [2024-10-15]

Viola, S. & Moncrieff, J. (2016). Claims for sickness and disability benefits owing to mental disorders in the UK: trends from 1995 to 2014. *BJPsych Open*, 2 (1), 18–24. https://doi.org/10.1192/bjpo.bp.115.002246

Volk, J. (2022). Veterinarian Wellbeing and Mental Health. In: Loue, S. & Linden, P. (eds) *The Comprehensive Guide to Interdisciplinary Veterinary Social Work*. Springer International Publishing. 229–245. https://doi.org/10.1007/978-3-031-10330-8_10

Wallace, J.E. (2019). Meaningful work and well-being: a study of the positive side of veterinary work. *Veterinary Record*, 185 (18), 571–571. https://doi.org/10.1136/vr.105146

Whitnall, V.M. & Simmonds, J.G. (n.d.). Occupational stress and coping strategies in experienced Australian veterinarians. *VetRecord*, 189 (2), e202. https://doi.org/10.1002/vetr.202

Wong, J., Motulsky, A., Abrahamowicz, M., Eguale, T., Buckeridge, D.L. & Tamblyn, R. (2017). Off-label indications for antidepressants in primary care: descriptive study of prescriptions from an indication based electronic prescribing system. *BMJ*, 356, j603. https://doi.org/10.1136/bmj.j603

Wong, J., Motulsky, A., Eguale, T., Buckeridge, D.L., Abrahamowicz, M. & Tamblyn, R. (2016). Treatment indications for antidepressants prescribed in primary care in Quebec, Canada, 2006-2015. *JAMA*, 315 (20), 2230–2232. https://doi.org/10.1001/jama.2016.3445

Zimmermann, C., Strohmaier, S., Niederkrotenthaler, T., Thau, K. & Schernhammer, E. (2023). Suicide mortality among physicians, dentists, veterinarians, and pharmacists as well as other high-skilled occupations in Austria from 1986 through 2020. *Psychiatry Research*, 323, 115170. https://doi.org/10.1016/j.psychres.2023.115170

Zyl, P.M. van, Joubert, G., Bowen, E., Plooy, F. du, Francis, C., Jadhunandan, S., Fredericks, F. & Metz, L. (2017). Depression, anxiety, stress and substance use in medical students in a 5-year curriculum. *African Journal of Health Professions Education*, 9 (2), 67–72

Popular science summary

For many years, research has shown alarming trends of low mental health and high levels of stress, anxiety and depression among veterinary professionals in many different countries. The suicide rate for this occupational group has also been repeatedly reported as higher that of the general national population in several countries around the world. Different potential causes for these trends have been suggested by the scientific literature, and while some are general challenges like a high workload and long working hours, some are more specific to the veterinary profession, such as working with bereaved clients and participating in euthanasia.

However, it has been reported that it is not only the veterinary professionals who experience higher than average levels of depression, stress and burnout, but also veterinary medicine students. The potential causes of low mental health and psychosocial wellbeing have been found to be similar but naturally not identical for the veterinary students and professionals. A high academic workload has been reported in the literature as one of the most reported sources of stress. The research regarding the mental health of veterinary medicine students is not as extensive as that regarding veterinary professionals.

This project aimed to investigate two aims. Firstly, what is the current state of the psychosocial wellbeing of veterinary medicine students in Sweden, Norway, Denmark, Finland, the UK and Australia? Secondly, how does the psychosocial wellbeing differ between the selected countries?

To get closer to an answer to these questions, a survey was conducted to all third, fourth, fifth and sixth-year students in the previously mentioned countries and chosen universities. The survey was based on COPSOQ III, an internationally validated questionnaire regarding psychosocial work environments, which was altered to suit the student population. Eleven dimensions were chosen for the survey: emotional demands, work engagement, work life conflict, self-related health, stress, cognitive stress, somatic stress, depressive symptoms, burnout, self-efficacy and seeping troubles. Each dimension includes between two and six multiple choice questions. The survey was open for three weeks and in total, 239 responders were included in the data analysis. The response rates varied from 0% (Denmark) to 26.3% (Sweden), and the country distribution ranged from 13% (UK) to 40% (Sweden). The alphabetical scores were translated to numerical scores in accordance with COPSOQ.

Regarding the first aim, when comparing the survey results to reference scores for the general Australian working population, troubling conclusions were drawn. The average across all participants score for eight of the dimensions were ten or more points less desirable than the reference. This indicated a significant difference according to COPSOQ. Only one dimension, sleeping troubles, was repor-

ted as slightly more desirable for the student group compared to the reference. Out of the 11 dimensions included in the survey, the ones with the most troublesome results were burnout, stress and cognitive stress.

When it comes to the second aim and the comparison of the individual countries' scores, the following ranking can be seen as a summary:

1. Finland: 4 dimensions better than average across countries and 0 dimensions worse. 7 dimensions comparable.
2. Norway: 4 dimensions better than average across countries and one dimension worse. 6 dimensions comparable.
3. Australia: 2 dimensions better than average across countries and 3 dimensions. 6 scores comparable.
4. Sweden: 0 dimensions better than average across countries and 4 dimensions worse. 7 dimensions comparable.
5. The UK: 1 dimension better than average across countries and 6 dimensions worse. 4 dimensions comparable.

Regarding the question of potential causes which may have a negative effect on the responder's mental wellbeing, Academic factors were most frequently reported in all countries except for Finland, where transitional factors were reported as having a more profound effect.

The results from this survey are mainly descriptive and meant to shine a light on the current state of the psychosocial wellbeing on veterinary students in different countries, and how the countries differ from each other. By showing that there is a common theme of low mental health among the veterinary students who participated in this survey, yet a difference between the countries, it would be interesting for future research to focus on what makes these countries different in other ways and what might be individual country factors affecting the psychosocial wellbeing of its veterinary students. Thus, more research is needed on the subject and efforts should be made to obtain a high response rate among the students for better representation.

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Appendix 1

Survey of psychosocial wellbeing amongst clinical veterinary medicine students

Dear future colleague,

As you may know the mental wellbeing of many veterinary professionals has been shown to be alarmingly bad. It is therefore of great interest to investigate the mental wellbeing of veterinary students and relate this to existing data on veterinary proffessionals.

For the independent project of my final semester of veterinary school, I have chosen to do a survey regarding the psychosocial wellbeing of veterinary students in their mid to final years of education. This survey has been sent to students in Sweden, Norway, Denmark, Finland, United Kingdom and Australia. The results from the survey will be analyzed and compared independently as well as compared with the existing data on psychosocial wellbeing amongst clinically working veterinarians. The final project will be presented in January 2025 at the Swedish University of Agricultural Sciences.

Anonymity for respondents, responses and data confidentiality is guaranteed. Your participation is 100% voluntary. The questions are based on COPSOQ III, an internationally validated questionnaire on psychosocial factors at work. To read more about this please visit https://www.copsoq-network.org/. If the survey gets more than 100 responders the data may be added to the COPSOQ databank according to the central COPSOQ requests, remaining anonymous.
Please note that the word "**work**" has a different meaning in this survey to make it applicable to university students. In this survey "**work**" refers to your experience, responsibilities and expectations as a current veterinary student. It may also refer to the university where you are currently enrolled in the veterinary program.

The survey has **48 multiple choice questions** and it takes approximately **5-10 minutes** to complete the survey. The **deadline** to fill out this survey is **Friday October 22nd 2024.**

I am very grateful for your participation.

If you have any questions or concerns, please don't hesitate to contact me on somn0006@stud.slu.se.

Warm regards,
Sofia Mathiassen
Swedish University of Agricultural Sciences

* Indicates required question

How old are you? *

Your answer

Are you: *

Choose

Woman

Man

Other/do not want to specify

In which country do you study? *

Choose

Psychosocial work environment

The following questions are about your psychosocial work environment.

Emotional demands *

	Always	Often	Sometimes	Seldom	Never/hardly ever	Do not know/do not wish to answer
Does your work put you in emotionally disturbing situations?	○	○	○	○	○	○
Do you have to deal with other people's personal problems as part of your work?	○	○	○	○	○	○

Emotional demands & work life conflict. The last five questions concern the ways in which your work affects your private life. *

	To a very large extent	To a large extent	Somewhat	To a small extent	To a very small extent	Do not know/do not wish to answer
Is your work emotionally demanding?	○	○	○	○	○	○
Are there times when you need to be at work and at home at the same time?	○	○	○	○	○	○

Does your work drain so much of your energy that it has a negative effect on your private life?	○	○	○	○	○	○
Do you feel that your work takes so much of your time that it has a negative effect on your private life?	○	○	○	○	○	○
The demands of my work interfere with my private and family life?	○	○	○	○	○	○
Due to work-related duties, I have to make changes to my plans for private and family activities.	○	○	○	○	○	○

Work engagement: How often do you experience the following... *

	Always	Often	Sometimes	Seldom	Never/hardly ever	Do not know/do not wish to answer
At my work, I feel bursting with energy.	○	○	○	○	○	○
I am enthusiastic about my work.	○	○	○	○	○	○
I am immersed in my work.	○	○	○	○	○	○

Health

The following questions are about your own health and well-being. Please **do not** try to distinguish between symptoms that are caused by work and symptoms that are due to other causes. The task is to describe how you are in general.

The questions are about your health and well-being **during the last four weeks:**

Self related health *

	Excellent	Very good	Good	Fair	Poor	Do not know/do not wish to answer
In general, would you say your health is:	○	○	○	○	○	○

If you evaluate the best conceivable state of health at 10 points and the worst at 0 points: how many points do you then give your present state of health? *

Choose

Sleeping troubles and stress (general, somatic & cognitive) *

The questions are about your health and well-being **during the last four weeks:**

	All the time	A large part of the time	Part of the time	A small part of the time	Not at all	Do not know/do not wish to answer
How often have you slept badly and restlessly?	○	○	○	○	○	○
How often have you found it hard to go to sleep?	○	○	○	○	○	○
How often have you woken up too early and not been able to get back to sleep?	○	○	○	○	○	○
How often have you woken up several times and found it difficult to get back to sleep?	○	○	○	○	○	○
How often have you had problems relaxing?	○	○	○	○	○	○

How often have you been irritable?	○	○	○	○	○	○
How often have you been tense?	○	○	○	○	○	○
How often have you had stomach ache?	○	○	○	○	○	○
How often have you had a headache?	○	○	○	○	○	○
How often have you had palpitations?	○	○	○	○	○	○
How often have you had tension in various muscles?	○	○	○	○	○	○
How often have you had problems concentrating?	○	○	○	○	○	○
How often have you found it difficult to think clearly?	○	○	○	○	○	○
How often have you had difficulty in taking decisions?	○	○	○	○	○	○
How often have you had difficulty with remembering?	○	○	○	○	○	○

Burnout and depressive symptoms *

The questions are about your health and well-being **during the last four weeks:**

	All the time	A large part of the time	Part of the time	A small part of the time	Not at all	Do not know/do not wish to answer
How often have you felt worn out?	○	○	○	○	○	○
How often have you been physically exhausted?	○	○	○	○	○	○
How often have you been emotionally exhausted?	○	○	○	○	○	○
How often have you felt tired?	○	○	○	○	○	○
How often have you felt sad?	○	○	○	○	○	○
How often have you lacked self-confidence?	○	○	○	○	○	○
How often have you had a bad conscience or felt guilty?	○	○	○	○	○	○
How often have you lacked interest in everyday things?	○	○	○	○	○	○

Self-Efficacy *

	Fits perfectly	Fits quite well	Fits a little bit	Does not fit	Do not know/do not wish to answer
I am always able to solve difficult problems, if I try hard enough.	○	○	○	○	○
If people work against me, I find a way of achieving what I want.	○	○	○	○	○
It is easy for me to stick to my plans and reach my objectives.	○	○	○	○	○
I feel confident that I can handle unexpected events.	○	○	○	○	○
When I have a problem, I can usually find several ways of solving it.	○	○	○	○	○
Regardless of what happens, I usually manage.	○	○	○	○	○

Potential causes *

In your own experience and opinion, how much do the following areas negativly affect your current mental wellbeing?

	To a very large extent	To a large extent	Somewhat	To a small extent	To a very small extent/not at all	Do not know/do not wish to answer
Academic (e.g., large workload, difficult content, faculty expectations, competition)	○	○	○	○	○	○
Transitional (e.g., moving from secondary education/to clinical years, transport, financial difficulties, social interactions)	○	○	○	○	○	○
External relationships (e.g. family illness/death, partner/marriage relationship difficulties)	○	○	○	○	○	○
Veterinary-related (e.g., long working hours, ethical dilemmas, difficult animal–client interactions, euthanasia)	○	○	○	○	○	○

Appendix 2

Reference values per dimension. Average score and a 95% Confidence interval per dimension for all participants, average across countries as well as country specific average scores. The table also repeats the number of participants in total and per country. Scale 0-100. Scores and 95% CI reported with one decimal.

Australia	Finland	The UK	Norway	Sweden
59,0 (±6,2)	52,8 (±5,1)	60,0 (±5,3)	45,6 (±5,6)	56,7 (±3,5)
65,5 (±4,1)	59,7 (±5,4)	65,6 (±4,6)	54,4 (±4,1)	54,7 (±3,0)
57,93 (±6,9)	40,5 (±7,0)	60,6 (±9,6)	38,8 (±7,6)	60,5 (±4,4)
60,4 (±6,8)	62,5 (±6,6)	58,6 (±5,9)	62,1 (±5,9)	52,4 (±3,8)
45,4(±7,7)	30,9(±6,0)	42,9(±8,7)	32,5(±6,7)	35,4(±4,4)
67,2(±6,3)	52,6(±7,0)	69,8(±6,8)	53,2(±7,0)	60,6(±4,2)
59,7(±7,0)	51,6(±6,6)	61,4(±8,1)	51,1(±5,9)	56,0(±4,2)
42,5(±7,4)	36,6(±6,7)	46,9(±7,6)	32,8(±5,2)	40,2(±4,0)
54,6(±7,9)	50,2(±7,8)	53,3(±9,2)	50,2(±7,2)	53,5(±4,6)
46,7(±6,8)	41,7(±7,6)	51,0(±7,5)	46,5(±6,5)	53,8(±3,9)
59,9(±6,4)	56,8(±7,6)	51,9(±5,0)	53,0(±5,5)	51,7(±3,9)
37	36	30	40	97
15%	15%	13%	17%	40%

Dimension/Average score (*95% CI*)	**Average across participants**	**Average across countries**
Emotional demands (questions ED1, EDX2 & ED3)	55,0(±2,3)	55,0
Work engagement (questions WE1-3)	58,4(±2,0)	60,0
Work life conflict (questions WF1-6)	53,4(±3,1)	51,8
Self-related health (questions GH1-2)	57,5(±2,5)	59,2
Sleeping troubles (questions SL1-4)	36,8(±2,9)	37,4
Burnout (questions BO1-4)	60,3(±2,7)	60,7
Stress (questions ST1-3)	55,8(±2,7)	56,0
Somatic stress (questions SO1-4)	39,7(±2,6)	39,8
Cognitive stress- (questions CS1-4)	52,6(±3,0)	52,3
Depressive symptoms (questions DS1-4)	49,3(±2,7)	48,1
Self-efficacy (questions SE1-6)	54,0(±2,5)	54,6
Number of participants		239
Approximate distribution between countries		100%

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