

Critical thinking in musicians' health education. Findings from four workshops with experts (Part I)

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Abstract

Health education encompasses building health knowledge, but also training skills such as critical thinking, that guide individuals' ability to access, understand and use health information to take care of their own health (WHO, 1998). This study aimed to document expert discussions on the content of an ideal health education curriculum for higher music education (HME) students in the UK, integrating critical thinking. Four interdisciplinary workshops were conducted, where 67 experts in relevant fields discussed the content of four lists created based on literature reviews (cognitive biases, logical fallacies, critical appraisal tools, and health topics). Notes taken during the discussions were thematically analysed. Most of the participants thought that the topics and tools were relevant. Two of four identified themes are reported in this paper, which represents the first of a two-part series: 1) Critical thinking applied to health; and 2) Misconceptions. This is the first attempt to document conversations aimed at using the applied knowledge of key stakeholders to discuss the content of an ideal health education curriculum integrating critical thinking, for conservatoire students.

Keywords: health education, conservatoire students, critical appraisal, cognitive biases, logical fallacies

Lay summary

Professional classical musicians struggle with a range of occupational health issues, but clear guidelines around health education in HME are still missing. This paper reports the first attempt to document a series of four interdisciplinary discussions between 67 experts on 1) the ideal health education content for music students, and 2) the integration of critical thinking as part of music students' health education. Discussions were facilitated by comprehensive lists based on literature reviews. Notes were taken during discussions and were thematically analysed. Four themes were identified, two of which are discussed here: 1) Critical thinking applied to health; and 2) Misconceptions.

Critical thinking in musicians' health education. Findings from four workshops with experts (Part I)

Professional music making is associated with health risks including musculoskeletal problems (Rotter et al., 2020), hearing loss (O'Brien et al., 2014; Pouryaghoub et al., 2017), performance anxiety (Burin & Osorio, 2016; Matei & Ginsborg, 2017), and mental ill-health (Ackermann et al., 2014; Fishbein et al., 1988; Kegelaers et al., 2021; Kenny et al., 2014). Risk factors associated with musicians' health problems are manifold and include: exposure to loud music (Zhao et al., 2010), public exposure, personal hazards, repertoire, competition, injury/illness, and criticism (Vervainioti and Alexopoulos, 2015); long hours at work, high job demands, low control/influence, lack of social support (Jacukowicz, 2016), precarious work conditions, financial instability, inadequate industry regulation, working in isolation (Van den Eynde et al., 2016; Visser et al., 2022); but also genetics, the individual's experience, emotions, cognitions and behaviours (Kenny, 2011). Furthermore, rigid, archaic norms and authoritative, abusive teaching styles that dominate the classical music industry and its institutions may lead to internalised maladaptive perfectionism, mistake rumination, over-focusing, distress, and self-blame (Détári and Egermann, 2022; Leech-Wilkinson, 2020). These have a negative impact on musicians' performance and health (Détári et al., 2022; Mornell and Wulf, 2019), particularly those in higher music education (HME). Music students may struggle with more health problems, distress, and sleep problems than non-music students (Ginsborg et al., 2009; Araujo et al., 2017; Robson & Kenny, 2017; Vaag et al., 2016a, b, c; Vaag et al., 2021). Younger musicians may be more anxious than older ones (Kenny et al., 2014), with some mental health outcomes already worsening between the start of one's university studies and the end of the first year (Casanova et al., 2018; Rosset et al., 2022; Matei et al., 2018). Institutions have responded to the ethical imperative to support musicians' health by offering health education courses.

Health education involves developing health knowledge and a relevant set of cognitive and social skills, including critical thinking, that guide individuals' motivation and

ability to access, understand and use health information to take care of their own health (WHO, 2016). Music students' awareness of health risks and related knowledge tend to be poor (Matei & Ginsborg, 2020; Wijsman & Ackermann, 2019). Some authors think it may be important to teach musicians how to access reliable information in the form of peer-reviewed research papers and how to apply it (Ackermann, 2019). Despite this, the focus in health education tends to be on delivering health-related information (Matei et al., 2018; Matei & Ginsborg, in press), and not necessarily on equipping students to interpret health-related information or question relevant assumptions (Matei, 2019; Matei & Ginsborg, 2021; Wijsman, 2012). However, authors have already recommended that health-related myths be dispelled via education (Brandfonbrener, 1991; Rickert et al., 2014a). Although several health education courses have been implemented in HME and evaluated in the form of peer-reviewed publications (Matei et al., 2018), there is no consensus around what ought to be included in such courses. Therefore, one of our two aims was to address this via discussions around the ideal content for health education. The other aim was to discuss the integration of critical thinking as part of this content.

Pseudoscientific claims might find particularly fertile ground in applied contexts such as coaching, sports, and education, given their prioritising perceived usefulness in practice over empirical evidence (Bailey et al., 2018). While we do not know anything about classical musicians' health-related critical thinking or the health-related misconceptions they may hold, university music students in Germany are unable to distinguish between scientifically substantiated claims and myths related to music education (Düvel et al., 2017), thereby highlighting the need for more scientific content in higher education (Torrijos-Muelas et al., 2021). For the purposes of this paper, we refer to critical thinking as the ability to acknowledge misconceptions, biases, and fallacies that may have a negative impact on musicians' health and wellbeing, and question them. In an attempt to make use of already existing tools, we created and made use of specific lists of cognitive biases, logical fallacies, and critical appraisal tools.

Our approach was guided by the Informed Health Choices (IHC) framework for assessing the reliability of claims about treatment effects, which includes concepts about fair comparisons, informed choices, and claims about treatment effects (Chalmers et al., 2018). We wanted to focus on identifying health-related misconceptions among music students, but also to make use of well-documented lists of clear tools that could easily be understood by anyone when associated with relevant examples. Therefore, we chose to include logical fallacies and cognitive biases, since these can be applied to both claims about treatment effects and broader misconceptions more loosely related to health and wellbeing (Oxman & Martinez Garcia, 2020). Although a precise definition of critical thinking is debatable (Larsson, 2017; Puig et al., 2019), educational interventions promoting effective thinking must address potential flaws in reasoning, such as logical fallacies and the cognitive biases. Although often used interchangeably, logical fallacies are the reasoning errors we commit, whereas cognitive biases refer to our predisposition to commit these errors. As such, both are relevant here.

For our paper, critical thinking applied to health included: 1) cognitive biases, 2) logical fallacies (used here to include formal fallacies such as affirming the consequent and informal fallacies such as an appeal to authority), and 3) critical appraisal. Additionally, we looked at 4) the identification of health-related misconceptions so as to better tailor this to musicians' needs.

This study brought relevant experts together to brainstorm ideas, using the relevant literature as a starting point. These conversations took place as part of four workshops and the aim of this study was to document them. The objectives of the conversations were to 1) explore the content of an ideal health education programme for music students on the basis of literature reviews of already existing health education content for musicians; and 2) explore the integration of critical thinking training as part of this health education programme, via facilitating discussions on the basis of three specific lists of cognitive biases, logical

fallacies, and critical appraisal tools. The present paper only addresses the second objective, as the first objective is addressed elsewhere.

Method

Design

Four one-day workshops were conducted in September 2018, in the UK. Data were collected at each workshop, cross-sectionally.

Materials

We created a set of four lists (cognitive biases; logical fallacies; critical appraisal tools; health topics) based on reviews of the available literature, systematic reading, and discussions with colleagues. However, only three of these lists will be the focus of this study, not the health topics one (see Table 1). This paper is part one of two. Part one is focused on the critical thinking content of health education in HME, whereas part two is focused on the ideal health education curriculum and its implications for the wider context of health promotion. As such, the discussion related to the health topics list is reported in part two (Matei & Phillips, in press).

The three lists were based on the following: the Cognitive Bias Codex (Benson, 2016) (for cognitive biases); a comprehensive Wikipedia page (for logical fallacies); and tools recommended for journalists and/or the general public (Austvoll-Dahlgren et al., 2015; Evans et al., 2011; Irwig et al., 2008) (for critical health appraisal tools). Austvoll-Dahlgren et al. (2015) report how their 29-member advisory group reviewed a list of 32 concepts that may universally allow people to assess claims about health treatments. The list was compiled based on a review of contemporary resources aimed at improving people's ability to understand, use and communicate research evidence about treatment effects. We also consulted the original resources used by Austvoll-Dahlgren et al. (2015), namely "Testing Treatments" (Evans et al., 2011), and a book by Irwig et al. (2008) which presented key concepts around assessing treatments in a very accessible manner. We did not aim for a

similarly exhaustive list as that provided by Austvoll-Dahlgren et al. (2015). Given the wide variety of participants, we did not want them to spend most of the time wondering about epidemiological and clinical concepts such as risk, or randomization. Our purpose was broader, namely more to provide what we thought might be the most accessible and relevant concepts and stimulate a discussion around whether such concepts could be incorporated as part of musicians' health education at least in principle. We followed a similar process with the lists of cognitive biases and logical fallacies and so used some of the most relevant concepts to musicians that were applicable to health, based on our judgement as musicians ourselves, in order to stimulate a discussion. Topics on the three lists were accompanied by brief definitions and were illustrated with examples to make it easier to assess their applicability to musicians' health.

[insert - Table 1. Cognitive biases, logical fallacies, and critical appraisal tools - here]

Procedure and Participants

Ethical approval was granted by the Royal Northern College of Music Ethics Committee. The workshops were opened to musicians; psychologists; sports scientists; health educators; health professionals working with musicians, dancers, and athletes; cognitive scientists; and PhD students in relevant fields. Our choice for interdisciplinary workshops was broadly based on recommendations for guideline development, despite our discussions being aimed at brainstorming ideas mostly. Given the lack of gold standards around group processes in such endeavours, we aimed to bring together people from all relevant disciplines in order to minimise bias, consider all arguments and offer them a fair chance to influence the outcome (Austvoll-Dahlgren et al., 2015; Fretheim et al., 2006). We adopted a broad approach to health and aimed to bring together people with experience working with musicians, those with content expertise regarding health, end users themselves, and relevant stakeholders. Working or having worked with musicians was not a compulsory criterion when choosing experts, and so we also had health professionals and sports psychologists who worked with athletes, and not with musicians. We welcomed them

given their relevant knowledge which could potentially be transferred to the music occupation. After all, despite their relevance for music performance, concepts from performance psychology are still poorly adapted and understood among musicians (Pecen et al., 2016). However, given our very broad approach to health, we included notions relevant to performance derived from performance psychology and sports sciences. We also invited philosophers and specialists in critical thinking and health literacy. Furthermore, we aimed to allow people plenty of time to reflect and express their views. The information was advertised via social media, our personal and professional networks, and relevant faculties and university departments. Individuals were asked to choose which of the four workshops they wanted to attend before receiving a confirmation via email.

At the workshops, we gave a brief summary of musicians' health problems, and presented the four lists. Participants were told about the purposes of the research, and were asked to read the participant information sheet, sign the consent form and complete the 'About you' form. Participants were informed that if they changed their mind about participating, they had to withdraw before the discussions. Then, participants were divided into small interdisciplinary groups and asked to discuss the lists on the basis of specific questions, for slots of 45 minutes interrupted by large group discussions and reporting back. The questions were also based on those used by Austvoll-Dahlgren et al. (2015). While they measured participants' answers quantitatively, we chose a qualitative methodology, given our broader scope and the aim for a wider discussion. Also, we had a much more interdisciplinary participation and much less clarity around what should be considered as part of musicians' health education. The second author took notes during large group discussions. However, participants were also encouraged to take notes during their small group conversations and return them at the end of the workshop, or email them to us. All written notes from authors and participants were finally used as material for thematic analysis.

Analysis

All notes were analysed using template analysis (Brooks et al., 2015). After familiarisation with the data, the first author identified *a priori* themes which were most likely to guide the analysis, based on the study's aims and specific discussion questions (see Supplementary Material S1). The themes were then organised into meaningful clusters and a thematic template was proposed. Based on a subset of data, we cross-checked the themes which were subsequently applied to all data. The question under 'Cognitive biases, logical fallacies & critical appraisal tools', namely "Can you think of common health-related misconceptions that musicians might hold and that might need to be addressed/corrected? (accompanied by the following explicit examples which participants had access to: 'I suffer from performance anxiety, therefore I must be a poor musician'; 'No pain, no gain')", was not asked in the first workshop due to time constraints. However, answers to this question were integrated as part of the other themes, given their close connectedness.

Results and Discussion

The four workshops were attended by 67 participants (11, 12, 23, and 21 respectively), with representatives from most relevant domains of expertise (see Table 2 for a complete list). In order to find out what these were, we asked them about their professional background and whether they identified as musicians; 70% ($n = 47$) did. Notes from only four groups covering three of the sessions were emailed or returned.

[insert - Table 2. Participants' characteristics - here]

According to the thematic analysis, we identified four themes, two of which are discussed in this paper. Theme 1) Critical thinking in health education focuses on the critical thinking content that could be integrated as part of an ideal health education course and included a discussion around cognitive biases (subtheme 1.1); logical fallacies (1.2); critical appraisal tools (1.3); and the issue of evidence (1.4). Theme 2) Misconceptions focuses on misconceptions that may be prevalent among musicians and which may stop them from being able to think critically. These include: Success and "How many hours are you

practicing?" (2.1); Stigma / "No pain, no gain" (2.2), with sub-subtheme Suffering for art / "They aren't suffering, they're talented" (2.2.1); and Musicians' bubble / "If my teacher says it, it must be right" (2.3). Please see Table 3 for all the themes and accompanying examples of verbatim quotes.

[insert - Table 3. Themes and verbatim quotes – here]

Theme 1. Critical thinking applied to health

Overall, participants agreed that understanding biases and being equipped with critical appraisal tools could help musicians regarding treatment selection, as well as to "question authority" represented here by their teachers and "critique the world they're entering into". One participant said: "[. . .]. Perhaps training everyone in basic scientific approaches and critical thinking might help them so they can consider the options and the evidence and make their own choices." As part of this theme, we have included the discussions around the three lists (cognitive biases, logical fallacies, and critical appraisal tools). Furthermore, we identified another sub-theme around critical thinking applied to health, namely 'the issue of evidence'. We included examples that accompanied the items on the three lists in an attempt to clarify the items' relevance for musicians' health and wellbeing and focus the discussion even more.

1.1 Cognitive biases

Most participants agreed that cognitive biases were overall relevant to the musical environment and musicians' health and wellbeing, with some more relevant than others. Particularly relevant were effort justification, the halo effect, authority bias, availability heuristic, and the mere exposure effect (see Table 1 for more detail on these biases). Effort justification, whereby people value something more just because it is effortful, was associated with the focus on quantity more than quality when practicing. The halo effect, wherein positive feelings about a person in one area cause their ambiguous or neutral traits to be viewed positively, received mixed feedback. Some thought that it is intrinsic to the

personal nature of the student-teacher relation and that it might be endorsed in masterclasses, whereby “students latch on to personal advice as opposed to evidence-based”. In this sense, the halo effect could lead to an overly optimistic appraisal of the instrumental tutor’s ability to offer health advice, which might explain why this is who the students ask in the first instance (Williamon & Thompson, 2006). As for authority bias (according to which an assertion is deemed true because of the position or authority of the person asserting it), some thought that it may be intertwined “with a need to bow to authority for work” and with students’ need to “worship” their teachers. Magical thinking (an irrational belief that thoughts by themselves can affect the world) was speculated to potentially be due to the “personality profiles of artists – more prone to quackery? Would we be having this discussion in a science faculty?”. A predisposition to magical thinking could hinder efforts to counteract these biases by simply presenting evidence and argument. Despite the fact that critical thinking may be an ideal and that some biases may not be within our educational reaches, including information about biases in education has been recognised as an obvious first step in training critical thinking. Cognitive biases are also important in judgment and decision-making applied to health (Riva et al., 2015). This can at least equip students to detect situations in which they need to be alert (Lilienfeld et al., 2009; Macdonald et al., 2017; Pettersson, 2020).

1.2 Logical fallacies

Similarly to cognitive biases, logical fallacies were considered largely relevant for musicians’ health and wellbeing, with some more than others. Particularly relevant ones were cherry picking (choosing only data that seem to confirm a particular position, while ignoring contradictory evidence); questionable cause (confusion of association with causation); appeal to tradition (a conclusion supported solely because it has long been held to be true); naïve realism (believing that we see the world around us objectively and that people who disagree with us must be irrational), appeal to authority (an assertion is deemed true because of the position or authority of the person asserting it), and appeal to nature ('natural'

is always good, and 'unnatural' is always bad) (see Table 1 for more details). Participants thought these applied to anyone, regardless of whether they were musicians or not. Although we have made the distinction between a bias and a fallacy (a bias is a predisposition to commit a fallacy, a fallacy is an error of reasoning), it is not clear that participants also made this distinction. So although it might be a reasonable conjecture that the prevalence of authority bias among musicians leads them to commit the appeal to authority fallacy when evaluating advice from their tutors, it could be that our participants simply saw these as equivalent. The responses of participants might also reflect some of their own prejudices about musicians, as being disorganised and prone to magical thinking fits the popular stereotype of the creative individual (Plucker et al., 2004). While there is some overlap between identifying faulty reasoning in arguments (i.e. via logical fallacies) and identifying faulty reasoning in claims about treatment (i.e. via critical appraisal tools below), logical fallacies could be applied to health more broadly (Oxman & Martinez Garcia, 2020) and this allowed us to tailor them to situations relevant to classical musicians.

1.3 Critical appraisal tools

While participants agreed with many of the tools we presented being relevant for musicians' health and wellbeing, disagreement was noted as follows: regarding the "earlier is not necessarily better", some participants thought that this relates more to disease and clinical levels and that "the disease model is problematic". Otherwise, they thought that "earlier IS better in almost every case". Some participants also disagreed with "Hope may lead to unrealistic expectations". Regarding the "Anecdotes are unreliable evidence" critical appraisal tool, some thought that "anecdotes can be relatable and if they are chosen right they could also help the program along (e.g. search for evidence-based anecdotes)". Regarding the "Common practice is not always evidence-based" critical appraisal tool, some thought that "common practice not always good, but what if it helps? Placebo effect can be very beneficial. If I experience it as beneficial, who is to say it isn't beneficial?". These points raise an important issue for the design of programmes aimed at incorporating critical

appraisal tools. In order to be effective, tools must be used with skill, suggesting that training in their use rather than mere exposure would be advisable. Students would then be more likely to determine when a medical model is appropriate, when anecdotal information is useful and to critically appraise common practices. According to meta-analytic findings, very few news reports about health interventions address conflicts of interest, alternative interventions, potential harms, costs, or quantify effects (Oxman et al., 2021).

1.4 The issue of evidence

A nuanced approach to evidence emerged from the discussions. Participants worried that it was difficult to establish what was evidence-based and what wasn't, especially given that "RCT and systematic review leaves very little – treatment groups might include people who are harmed/no benefit". Additionally, the evidence may be "related to ease of measurement" which made everything "very tricky". Also, "systematic reviews imply that a lot of studies have happened in a particular area so that systematic reviews can be possible. However, if one strong study exists, this should be enough to base good practice on until better evidence comes up. Lots of studies are not necessarily better than having a handful of rigorous ones". As such, we should "educate people to not assume that evidence base means treatment will suit individual". Also, there is a difference between "evidence of effectiveness", "lack of evidence" and "evidence of lack of effectiveness". Some thought there may be "[a] real problem with excluding something to insufficient evidence. SHOULD exclude if evidence of ineffective" or "evidence of harm". Some said there may be "different paradigms of knowledge" such as "gut instinct". As such, "anecdotes, hunches, intuitions not always bad guys". Some wondered whether "Acupuncture is [Complementary and alternative medicine] CAM or mainstream? Fluid definitions, as some became mainstream", or "Physio is supposed to be evidence-based". Some participants thought there were "issues with uncritical adherence to [evidence-based medicine] EBM". As such, it may be "wrong to exclude Feldenkrais, Alexander", especially when such interventions "depend on how taught". As the discussion around posture norms went into more depth, the physiotherapist in

the room said there was “no evidence for ‘posture norms’”. Indeed, there is evidence to suggest that when asked, physiotherapists cannot decide on what a correct posture is exactly (O’Sullivan et al., 2012). Instead, some thought that “Placebos can be effective as people believe in them”. The diversity of apparent epistemological commitments in our experts illustrates how complex a process reaching consensus can be. Indeed, this is congruent with the debate around the limitations of the evidence base and the extent to which it may be applicable to specific individuals and real-life scenarios. A more radical approach requires a sophisticated body of knowledge that would allow one to question the political agenda of the evidence base itself, in line with the broader discourse around the increasing medicalisation of society (Chinn, 2011). Furthermore, more research is needed on musicians’ attitudes towards evidence, particularly given their attraction towards practices that are not evidence-based and their higher use of complementary and alternative medicine (CAM) compared to the general workforce, for yet unknown reasons (Vaag & Bjerkeset, 2017). However, musicians from Norway, for instance, when compared to the general Norwegian workforce, also made more use of psychotherapy and psychotropic medication (Vaag et al., 2016b). Authors explained that these could be due to many factors and characteristics of the sample, such as a lower threshold of seeking help, and/or higher scores on personality traits such as neuroticism, openness to experience, and emotional competence (the ability to decode emotions in others). Whether the same factors might also contribute towards a higher use of CAM is yet to be clarified. A recent scoping review of how professional popular musicians perceive mental health interventions suggested that musicians prefer tailored approaches that are accessible and affordable, but that they also show a lack of awareness of supportive services (Visser et al., 2022). It is, of course, unclear whether CAM is perceived to be more accessible and affordable compared to mainstream healthcare by classical musicians. More research is needed. After all, it is true that despite the need for evidence-based health promotion “for all athletic performers”, scientific research on musicians is behind that on sports athletes, while performing arts medicine as a field is considerably younger than sports medicine (Wijsman & Ackermann, 2019).

Beyond the questions of scientific evidence, in a sociology-of-knowledge study, Liley (2019) explored how Western cultural values manifest in discourses around musicians' occupational health and how cultural stereotypes may interfere with broader approaches to health that go beyond individual responsibility. For instance, portraying musicians as irrational and irresponsible as a main narrative in scientific publications not only inhibits an empathetic response to those who may be suffering, but also places the emphasis on individual lifestyle factors while diverting attention from important factors such as the quality of their musical training and instrumental pedagogy. As such, even the relevant scientific literature may be biased if infused with the neoliberal ideology which holds individuals accountable for wider, systemic determinants of health and wellbeing.

Theme 2. Misconceptions

When asked to think of health-related misconceptions among classical musicians, participants came up with the following ones which are looked at in more detail as part of this section: Success and 'How many hours are you practicing (2.1); Stigma / "No pain, no gain" (2.2) with its sub-theme, Suffering for art / "They aren't suffering, they're talented" (2.2.1); and Musicians' bubble / "If my teacher says it, it must be right" (2.3).

2.1 Success and "How many hours are you practicing?"

This focused on success being poorly defined. Participants recognised the pressure associated with "If I'm not practicing this much, someone else will" associated with always feeling "the need to go above and beyond". One participant used to receive an email sent to all staff from a head of department saying that "you should always be doing music". As such, the message that "if you're not always performing, you're a poor musician" may be conveyed by those also obsess around "how many hours are you practicing?". Other authors have documented the reluctance of institutions/teachers to add anything to the curriculum that might reduce time for practice, as well as insufficient focus on the quality of practice (Pecen et al., 2016). What constitutes optimal practice, and the relationship between practice time

and achievement are research questions that are yet to be empirically explored (Bonneville-Roussy & Bouffard, 2015). In fact, a fixed number of practice hours per day can be an internalised norm that shapes one's identity or makes one question everything that is less than said norm (Juuti & Littleton, 2010). Focusing on quantity only might not allow the performer to identify the elements that might lead to successful outcomes (Pecen et al., 2016). This is important, given that for musicians, there may be a strong link between their performance output and subjective wellbeing. However, the relationship between wellbeing and performance is more complex. Often, as music performance relies on subjective assessment measures, affect might be the only means by which this evaluation takes place. More assessment measures should be used (Pecen et al., 2018). Davies (2006) wrote about the neoliberal meritocratic rhetoric in British HME according to which hard work and talent guarantee success. Given that institutions are competing for limited resources, these resources are, in fact, concentrated on developing those already able, thereby reinforcing elitism.

Participants also mentioned about the insistence on "professional sociability", "networking skills rather than 'craft'" and 'put self out there' as needed to be successful. While some agreed that these may be part of being successful, others were sceptical and questioned whether there was any evidence "to link success with social media profile". The importance of 'professional sociability' among conservatoire students and acquiring social capital in order to increase one's opportunities have been documented before. There is also tension between competing with peers for various opportunities while also being nice to them in the hope that the relationships with them may lead to opportunities for work (Dobson, 2010; Pecen et al., 2018; Perkins, 2013a, b).

Participants also discussed "the myth of 'youth' and the pressure that some students may already be 'old hats'". Some of Guptill (2011)'s participants perceived music as a sport for young people who also win more auditions. Some of Pecen et al. (2018)'s participants

mentioned being criticised for late specialization, despite the fact that they associated this with benefits for their development.

Participants worried that “experts in performing arts are not necessarily able to articulate what ‘successful’ means”, or may be blind to “how they ‘made it’”, unlike experts in other professions such as law, for example, and “may be misrepresenting profession”. Indeed, some teachers may be motivated to hide that success is indeed rare and may label those who quit as “insufficiently talented”, thereby feeding their students’ faith without which they may lose the motivation to practice for hours or move across the world following a mentor (Wagner, 2015). Wagner (2015) also mentions comparative failure as being characteristic of artistic education and how rarely failure is discussed transparently. When the young musician ‘fails’ as a soloist, they may start considering other musical careers such as teaching, which they perceive as less prestigious. All this pressure, competition, criticism, and socially prescribed perfectionism that are inherent to higher education music institutions have been associated with maladaptive cognitive-behavioural strategies such as rumination over mistakes, obsessive practice; anxiety and depression (Flett et al., 2002); and even neurological disorders such as focal dystonia (Detari et al., 2022). Too often, these strategies are studied in isolation, detached from the social, cultural, political, and ideological context which prompts them (Detari and Egermann, 2022; Detari et al., 2022; Leech-Wilkinson, 2020). For instance, while psychological and pharmacological treatments for music performance anxiety have been well documented (Kenny, 2005; Matei & Ginsborg, 2017), interventions or initiatives that look beyond the individual in an attempt to change systemic factors with the view that anxiety is but a normal response to a toxic system that needs to be challenged, are currently still missing.

2.2 Stigma / “No pain, no gain”

Among other misconceptions related to health, participants recognized the ‘No pain, no gain’ was still prevalent, just like “musicians’ collective confidence and their worry that speaking about performance anxiety might break the spell”. Around music performance

anxiety, another misconception that was voiced was that according to which “If I was good enough, I wouldn’t be getting nervous”. As such, some participants recognised there still is stigma attached to pain and anxiety. Some participants referred to a sort of “secrecy of suffering” and a superstitious “stay silent about difficulties”, because “If I talk about it, I’ll make it worse”. Participants also discussed about the stigma around mental health and taboos related to beta-blockers which “may be preventing people from seeking help”. However, there was confusion regarding normalizing ill health. While some thought this needs to happen, others worried that normalising it might translate into “somebody else worse implies I am not as bad so don’t need help”. Some of the participants also questioned the idea of stigma related to pain. They seemed to question the “perception that pain means doing something wrong – many problems are preventable, very few have underlying causes”. Also, they argued that one cannot be sure that the cause of pain is always instrumental technique. This misconception has already been confirmed in the literature. Leaver et al. (2011) found that 22% of 243 musicians from British orchestras felt they would risk their job if injury or illness would not allow them to work for three months. This is despite the fact that management staff do not believe that injury disclosure would influence their decision as to whether they would re-employ the musician disclosing injury (Rickert et al., 2014a). The ‘conceal and crash’ phenomenon has been considered as part of the orchestral workplace culture (Rickert et al., 2014b). Roos et al. (2021) spoke to orchestral musicians, conservatoire students, and orchestra administrators, and found that pain beliefs (such as no pain no gain, injury taboo, and pain-related fears) were the main cultural factors identified as barriers to implementing an exercise intervention among musicians. Guptill (2011) refers to a ‘culture of silence’, despite the fact that some musicians acknowledge that injury is limiting (Guptill, 2012), or might distract musicians from their music (Bourne et al., 2019), and thus, might be ignored by some (Rickert et al., 2015). Our participants rightly captured the nuanced nature of the no pain no gain claim (Stanhope & Weinstein, 2021). Given the multiple factors that influence pain, it is not clear whether not playing when in pain is necessarily desirable.

2.2.1 Suffering for art / "They aren't suffering, they're talented"

Linked to suffering was the idea of talent. Some participants thought that some students might believe that other students "they aren't suffering, they're talented" which could be translated into "I'm not as talented". The debate around hard work vs natural ability, however, is more complex, given that some music students might believe more in hard work whilst recognising that their views are different to the more fixed idea around talent that classical music promotes (Pecen et al., 2018). Furthermore, such views may be influenced by factors such as class and age (Davies, 2006). Another misconception was "the mental health problems-creativity association" and "myths of suffering for your art". Musicians might feel that their health is less important: "I am my instrument, therefore I primarily need to care for myself in the musical domain". Similarly, some alluded to the perception according to which "music making isn't physical", which is similar to the "music is ethereal and unquantifiable" identified by Pecen et al. (2016), and a diminished experience of their body when involved in making music (Guptill, 2011, 2012; Waters, 2019). Suffering for art has also been documented as being part of the musical culture (Roos et al., 2021). This belief might prevent musicians from seeking help or encourage them to engage in unhelpful behaviours (Pecen et al., 2016).

2.3 Musicians' bubble / "If my teacher says it, it must be right"

Another misconception linked to the idea of musicians as a special group ("musicians aren't like other people") was around the fact that there were "no services in NHS" for musicians. Regarding health professionals and "seeking treatment", however, some participants referred to a misconception according to which the "health practitioner has 'magic hand' and no work required from them". Such "unrealistic expectations contribute to mistrust of health professionals". Musicians might "expect the experts to 'fix the problems' for them". Similarly, "science cannot measure/capture art" and thus, might also be seen as less relevant. After all, "anyone in my industry knows better than very knowledgeable people outside my industry" seemed to capture the isolated image of the musician. Along these

lines, some participants also referred to a sort of 'teachers' fallacy' according to which "what works for me must work for you (e.g. conservatoire teachers for whom nothing ever went wrong)". Some participants worried about the misconception according to which "if my teacher says it, it must be right" and thought that seeing the teacher as an "oracle" was problematic. In this vein, "If deliverer of health advice isn't a musician (embedded in the field), they might be dismissed". Some participants referred to this as an "in your field bias". Similarly perhaps, some dancers who do not seek health advice may believe that the healthcare professional would not address their practical needs (Wang & Russell, 2018). As already discussed in section 1.4, beyond their relationship with evidence, healthcare services need to be perceived as relevant, affordable, and accessible for musicians to engage with them (Visser et al., 2022). On the other hand, the lack of specific knowledge on the part of healthcare professionals might lead to the actual underestimation of recovery needs and impact on playing (Rickert et al., 2014a).

In an attempt to counterbalance the misconception according to which musicians might be different or special, one participant (who was not a musician) thought that "science students have issues too" and "have to perform too" in conferences "and "get used to failure". Other participants thought that seeing musicians as "special" or "other" might be too "separatist/elitist".

Gaunt (2010) and Guptill (2012) spoke about the power that the student invests in the teacher, as well as the 'halo' effect. Leech-Wilkinson (2016) describes how it is part of the enforced utopia of classical music that those who do not conform to their teachers or the agreed norms will not last. Of course, this is problematic for health, given that music teachers do not receive relevant training and instead, rely on their own experience when giving advice (Norton et al., 2015a, b).

Limitations and strengths

Examples and descriptions helped make biases and fallacies relevant for musicians, and allowed participants to question them or find counter-arguments and perhaps decide that things are not that simple at all. However, these specific examples, for instance 'I suffer from performance anxiety, therefore I must be poor', or 'No pain, no gain' which accompanied the question "Can you think of common health-related misconceptions that musicians might hold that might need to be addressed/corrected?" may have prompted participants to think along similar lines or in a specific manner. A more detailed account of strengths and limitations can be found in Part 2.

Implications for practice and closing remarks

Our findings raise difficult questions. For instance, engaging in critical thinking might have an impact on cognition and negative emotions. In this regard, cognitive performance research mentions processing efficiency theory (Eysenck & Calvo, 1992), ironic process theory (Wegner et al., 1987), conscious interference of proceduralised skill (Beilock & Carr, 2001; Beilock et al., 2002; Masters & Maxwell, 2008), paralysis by analysis (Beilock, 2010). As such, we need to distinguish between the training of critical thinking in music education in the sense of equipping students with basic relevant critical appraisal tools to recognise misconceptions and challenge them on one hand, and the idea of a ruminative internal focus (i.e. focusing on the precision of finger movement and not making mistakes, as opposed to an external focus whereby the musician is concerned more with expressivity and communicating with the audience) during an actual performance, on the other hand. The former seems desirable and mostly beneficial. On the other hand, an internal focus/over-focusing during performance has been associated with poorer motor performance, musical expression, and learning (Duke et al., 2011; Mornell and Wulf, 2019; Wulf, 2013). While questioning may need to be suspended during one's actual performance by the performer, we argue that HME should go beyond training performance skills, and aim to also equip students to question professional norms and the ideology themselves.

While we do not suggest that music students should start reading peer reviewed papers to interrogate related misconceptions, being taught some basic critical thinking tools such as the ones presented here is congruent with the aim of higher education to enable students to become autonomous self-reflective graduates and to develop their transverse meta-cognitive competencies (Bacigalupo et al., 2016). Raising awareness of common misconceptions, biases and fallacies and disputing them via discussions might open the doors to new ideas and collaborations. Music educators themselves need to be trained accordingly, particularly given their influence on young musicians and thus their potential impact in challenging current norms and promoting both healthy scepticism and fresher, more creative approaches to music performance. Beyond specific lifestyle and health-related claims, these critical thinking tools could also be applied to questioning broader assumptions in classical music. As was seen here, actively encouraging music students to question some misconceptions perceived to have implications for their health and wellbeing will also require challenging conceptualisations around success, talent, and practice, and ideological norms around musicianship and performance. Specific ways in which norms in classical music could be questioned have already been documented (Leech-Wilkinson, 2016, 2018, 2020; Ritchey, 2019), including the positive effects of a freer approach to music performance on both musicians' wellbeing and their audience's (Dolan et al., 2013, 2018; Hill, 2017, 2018). These can take place as part of guided group discussions whereby students are actively encouraged to think for themselves. Finally, these initiatives could potentially accelerate the cultural changes needed to improve musicians' health, restore their autonomy, and bring the entire field closer to our century.

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Table 1*Cognitive biases, logical fallacies, and critical appraisal tools*

Cognitive biases	Definition and examples
1. Availability heuristic	A mental shortcut that relies on immediate examples that come to a given person's mind when evaluating a specific topic, concept, method or decision. The availability heuristic operates on the notion that if something can be recalled, it must be important, or at least more important than alternative solutions which are not readily recalled. Subsequently, under the availability heuristic, people tend to heavily weigh their judgments toward more recent information, making new opinions biased toward that latest news. E.g. If Alexander technique comes to mind quickly, it must be important.
2. Authority bias	The tendency to attribute greater accuracy to the opinion of an authority figure (unrelated to its content) and be more influenced by that opinion. E.g. She is my vocal teacher – she must know about singers' health!
3. Confirmation bias	The tendency to search for, interpret, focus on and recall information in a way that confirms one's preexisting beliefs or hypotheses. E.g. I'm an Alexander technique instructor and I am going to search for all studies that support it and question those that don't!
4. Halo effect (horns and halo effect)	This refers to an observer's overall impression of a person, company, brand, or product influencing the observer's feelings and thoughts about that entity's character or properties. The halo effect is a specific type of confirmation bias, wherein positive feelings in one area cause ambiguous or neutral traits to be viewed positively. The effect works in both positive and negative directions. If the observer likes one aspect of something, they will have a positive predisposition toward everything about it. If the observer dislikes one aspect of something, they will have a negative predisposition toward everything about it. E.g. My teacher is so wise, thoughtful and intelligent – I can't see how she can say something wrong!
5. Effort justification	People's tendency to attribute a greater value (greater than the objective value) to an outcome they had to put effort into acquiring or achieving. E.g. I've spent so much time using this practicing strategy – it must be important and valuable.
6. Mere exposure effect	A psychological phenomenon by which people tend to develop a preference for things merely because they are familiar with them. In studies of interpersonal attraction, the more often a person is seen by someone, the more pleasing and likeable that person appears to be. E.g. The familiarity with certain practices which are not necessarily evidence-based, or with practicing strategies that might not be particularly effective.
7. Spotlight effect	The phenomenon in which people tend to believe they are being noticed more than they really are. E.g. It must be obvious that I have performance anxiety.

Logical fallacies	Definition and examples
Appeal to authority	(argument from authority, argumentum ad verecundiam) – an assertion is deemed true because of the position or authority of the person asserting it. E.g. Nevermind she doesn't have a science or a health-related background! She is my music teacher – she can't be wrong about musicians' health!
Appeal to accomplishment	An assertion is deemed true or false based on the accomplishments of the proposer. E.g. She is so successful and has won so many prizes – she must know what she's talking about when endorsing this technique!
Appeal to nature	Judgment is based solely on whether the subject of judgment is 'natural' or 'unnatural'. (Sometimes also called the "naturalistic fallacy") E.g. This product is natural/organic – it can't harm you! / E.g. The sugar in fruits is natural – can't be bad!
Appeal to novelty	(argumentum novitatis, argumentum ad antiquitatis) – a proposal is claimed to be superior or better solely because it is new or modern. E.g. This is a new treatment, so it's clearly superior to the older one! / E.g. This is a practicing strategy I haven't tried before – it has to be better!
Appeal to tradition	(argumentum ad antiquitatem) – a conclusion supported solely because it has long been held to be true. E.g. This practice has always been endorsed among musicians. Therefore, we must continue it!
Cherry picking	(suppressed evidence, incomplete evidence) – act of pointing at individual cases or data that seem to confirm a particular position, while ignoring a significant portion of related cases or data that may contradict that position. E.g. Nevermind that most my performance was fine – the fact that I made those three mistakes is what matters!
Magical thinking	Fallacious attribution of causal relationships between actions and events. In anthropology, it refers primarily to cultural beliefs that ritual, prayer, sacrifice, and taboos will produce specific supernatural consequences. In psychology, it refers to an irrational belief that thoughts by themselves can affect the world or that thinking something corresponds with doing it. E.g. I don't want to think about what I might do if I don't get the audition, as I might make that actually happen and not get the audition!
Naïve realism	The human tendency to believe that we see the world around us objectively and that people who disagree with us must be uninformed, irrational, or biased. E.g. It's so obvious to me – I can't be wrong! I'm not hallucinating after all, whereas these guys are victims of various biases – I don't see much subjectivism in my own approach, since I see these things clearly!
Nirvana fallacy (perfect-solution fallacy)	Solutions to problems are rejected because they are not perfect. E.g. The benefits might outweigh the harms, but this treatment still has some minor side effects.

Planning fallacy	<p>A phenomenon in which predictions about how much time will be needed to complete a future task display an optimism bias and underestimate the time needed.</p> <p>E.g. I know what steps I need to take to complete this task – it's easy to think of them, so everything will go smoothly.</p>
Questionable cause	<p>Is a general type error with many variants. Its primary basis is the confusion of association with causation. Either by inappropriately deducing (or rejecting) causation or a broader failure to properly investigate the cause of an observed effect.</p>
<p><i>Cum hoc ergo propter hoc</i> (Latin for "with this, therefore because of this"; correlation implies causation; faulty cause/effect, coincidental correlation, correlation without causation) – a faulty assumption that, because there is a correlation between two variables, one caused the other.</p> <p>E.g. My teacher sometimes treats me harshly. I don't know what it is that I'm doing to make her behave like that!</p> <p>E.g. She does yoga every morning and she's so happy! Therefore, yoga causes her to be happy!</p>	
<p><i>Post hoc ergo propter hoc</i> (Latin for "after this, therefore because of this"; temporal sequence implies causation) – X happened, then Y happened; therefore X caused Y.</p> <p>E.g. This mistake in my performance happened just after I decided to practice less - it can't be a coincidence, since it never happened before that! Rather, one caused the other!</p>	
Critical appraisal tools	Explanation and implications
Treatments can harm	<p>People often exaggerate the benefits of treatments and ignore or downplay potential harms. However, few effective treatments are 100% safe.</p> <p>Implication: Always consider the possibility that a treatment may have harmful effects.</p>
Anecdotes are unreliable evidence	<p>People often believe that improvements in a health problem (e.g. recovery from a disease) was due to having received a treatment. Similarly, they might believe that an undesirable health outcome was due to having received a treatment. However, the fact that an individual got better after receiving a treatment does not mean that the treatment caused the improvement, or that others receiving the same treatment will also improve. The improvement might have occurred even without treatment.</p> <p>Implication: Claims about the effects of a treatment may be misleading if they are based on stories about how a treatment helped individual people, or if those stories attribute improvements to treatments that have not been assessed in systematic reviews of fair comparisons.</p>

Association is not the same as causation	<p>The fact that a treatment outcome (i.e. a potential benefit or harm) is associated with a treatment does not mean that the treatment caused the outcome. For example, people who seek and receive a treatment may be healthier and have better living conditions than those who do not seek and receive the treatment. Therefore, people receiving the treatment might appear to benefit from the treatment, but the difference in outcomes could be because of their being healthier and having better living conditions, rather than because of the treatment.</p> <p>Implication: Unless other reasons for an association between an outcome and a treatment have been ruled out by a fair comparison, do not assume that the outcome was caused by the treatment.</p>
Common practice is not always evidence-based	<p>Treatments that have not been properly evaluated but are widely used or have been used for a long time are often assumed to work. Sometimes, however, they may be unsafe or of doubtful benefit.</p> <p>Implication: Do not assume that treatments are beneficial or safe simply because they are widely used or have been used for a long time, unless this has been shown in systematic reviews of fair comparisons of treatments.</p>
Newer is not necessarily better	<p>New treatments are often assumed to be better simply because they are new or because they are more expensive. However, they are only very slightly likely to be better than other available treatments. Some side effects of treatments, for example, take time to appear and it may not be possible to know whether they will appear without long term follow-up.</p> <p>Implication: A treatment should not be assumed to be beneficial and safe simply because it is new, brand-named or expensive.</p>
Expert opinion is not always right	<p>Doctors, researchers, patient organisations and other authorities often disagree about the effects of treatments. This may be because their opinions are not always based on systematic reviews of fair comparisons of treatments.</p> <p>Implication: Do not rely on the opinions of experts or other authorities about the effects of treatments, unless they clearly base their opinions on the findings of systematic reviews of fair comparisons of treatments.</p>
Beware of conflicting interests	<p>People with an interest in promoting a treatment (in addition to wanting to help people), such as making money, may promote treatments by exaggerating benefits and ignoring potential harmful effects. Conversely, people may be opposed to a treatment for a range of reasons, such as cultural practices.</p> <p>Implication: Ask if people making claims that a treatment is effective have conflicting interests. If they have conflicting interests, be careful not to be misled by their claims about the effects of treatments.</p>
More is not necessarily better	<p>Increasing the dose or amount of a treatment (e.g. how many vitamin pills you take) often increases harms without increasing beneficial effects.</p> <p>Implication: If a treatment is believed to be beneficial, do not assume that more of it is better.</p>

Earlier is not necessarily better	<p>People often assume that early detection of disease leads to better outcomes. However, screening people to detect disease is only helpful if two conditions are met. First, there must be an effective treatment. Second, people who are treated before the disease becomes apparent must do better than people who are treated after the disease becomes apparent. Screening tests can be inaccurate (e.g. misclassifying people who do not have disease as having disease). Screening can also cause harm by labelling people as being sick when they are not and because of side effects of the tests and treatments.</p> <p>Implication: Do not assume that early detection of disease is worthwhile if it has not been assessed in systematic reviews of fair comparisons between people who were screened and people who were not screened.</p>
Hope may lead to unrealistic expectations	<p>Hope can be a good thing, but sometimes people in need or desperation hope that treatments will work and assume they cannot do any harm. Similarly, fear can lead people to use treatments that may not work and can cause harm. As a result, they may waste time and money on treatments that have never been shown to be useful, or may actually cause harm.</p> <p>Implication: Do not assume that a treatment is beneficial or safe, or that it is worth whatever it costs, simply because you hope that it might help.</p>
Explanations about how treatments work can be wrong	<p>Treatments that should work in theory often do not work in practice, or may turn out to be harmful. An explanation of how or why a treatment might work does not prove that it works or that it is safe.</p> <p>Implication: Do not assume that claims about the effects of treatments based on an explanation of how they might work are correct if the treatments have not been assessed in systematic reviews of fair comparisons of treatments.</p>
Dramatic treatment effects are rare	<p>Large effects (where everyone or nearly everyone treated experiences a benefit or a harm) are easy to detect without fair comparisons, but few treatments have effects that are so large that fair comparisons are not needed.</p> <p>Implication: Claims of large effects are likely to be wrong. Expect treatments to have moderate, small or trivial effects, rather than dramatic effects. Do not rely on claims of small or moderate effects of a treatment, which are not based on systematic reviews of fair comparisons of treatments.</p>
How certain is the evidence?	<p>The certainty of the evidence (the extent to which the research provides a good indication of the likely effects of treatments) can affect the treatment decisions people make. For example, someone might decide not to use or to pay for a treatment if the certainty of the evidence is low or very low. How certain the evidence is depends on the fairness of the comparisons, the risk of being misled by the play of chance, and how directly relevant the evidence is. Systematic reviews provide the best basis for these judgements and should report an assessment of the certainty of the evidence based on these judgements.</p>

	Implication: When using the findings of systematic reviews to inform your decisions, always consider the degree of certainty of the evidence.
Do the advantages outweigh the disadvantages?	Decisions about whether or not to use a treatment should be informed by the balance between the potential benefits and the potential harms, costs and other advantages and disadvantages of the treatment. This balance often depends on the baseline risk (i.e. the likelihood of an individual experiencing an undesirable event), or on the severity of the symptoms. The balance between the advantages and disadvantages of a treatment is more likely to favour taking a treatment for people with a higher baseline risk or more severe symptoms. Implication: Always consider the balance between advantages and disadvantages of treatments, taking into consideration the baseline risk or the severity of symptoms.

Table 2*Participants' characteristics*

Participant background*	n
Musicians (music students, music teachers, orchestral players and freelance musicians)	25
Psychologists (including practitioners and academics in organizational, sports, music, health, counselling, and performance psychology)	11
PhD students in psychology and other related topics	9
Academics and researchers (music education, bioscience, physiotherapy, music, musicians' health and wellbeing)	8
Representatives from relevant charities and organisations	7
Counsellors, therapists, trainers, coaches	6
Consultants in musicians' health	4
Physiotherapists	3
Healthcare professionals (psychiatrist, nurse, GP)	3
Health/clinical librarians	2

Note. *The different specialisations are not mutually exclusive, given that each participant mentioned several specialisations

Table 3*Themes and verbatim quotes*

Theme	Sub-theme	Sub-sub-theme	Examples of quotes
Theme 1) Critical thinking in health education focuses on the critical thinking content that could be integrated as part of an ideal health education course.	Cognitive biases (subtheme 1.1)		“students latch on to personal advice as opposed to evidence-based” “whereas musicians are grounded in cynicism” “with a need to bow to authority for work” “descend into a spiral of self-doubt ‘He’s looking at his phone. I knew I was rubbish” “and judgement and the impact of anxiety on perception, e.g. a millisecond mistake feels like 5 seconds and ‘everyone heard it”. “personality profiles of artists – more prone to quackery? Would we be having this discussion in a science faculty?” “even when there is effort, there is also often a discounting of one’s performance, regardless of how hard people have worked”
		logical fallacies (1.2)	“disorganized nature of conservatoire students (e.g. essay-phobia and self-management issues)”
	critical appraisal tools (1.3)		“earlier is not necessarily better” “the disease model is problematic” “earlier IS better in almost every case” “Hope may lead to unrealistic expectations” “anecdotes can be relatable and if they are chosen right they could also help the program along (e.g. search for evidence-based anecdotes).” “common practice not always good, but what if it helps? Placebo effect can be very beneficial. If I experience it as beneficial, who is to say it isn’t beneficial?”
		the issue of evidence (1.4)	“RCT and systematic review leaves very little – treatment groups might include people who are harmed/no benefit” “systematic reviews imply that a lot of studies have happened in a particular area so that systematic reviews can be possible. However, if one strong study exists, this should be enough to base good practice on until better evidence comes up. Lots of studies are not necessarily better than having a handful of rigorous ones” “educate people to not assume that evidence base means treatment will suit individual” “anecdotes, hunches, intuitions not always bad guys” “Acupuncture is [Complementary and alternative medicine] CAM or mainstream? Fluid definitions, as some became mainstream” “Physio is supposed to be evidence-based”. “issues with uncritical adherence to [evidence-based medicine] EBM”

		<p>“wrong to exclude Feldenkrais, Alexander”, especially when such interventions “depend on how taught”</p> <p>“no evidence for ‘posture norms’”</p> <p>“Placebos can be effective as people believe in them”</p>
Theme 2) Misconceptions focuses on misconceptions that may be prevalent among musicians and which may stop them from being able to think critically.	Success and “How many hours are you practicing?” (2.1)	<p>“If I’m not practicing this much, someone else will”</p> <p>“the need to go above and beyond”</p> <p>“you should always be doing music”</p> <p>“if you’re not always performing, you’re a poor musician”</p> <p>“how many hours are you practicing?”</p> <p>‘you have to be perfect or no solution’. “technique + effort = guaranteed outcome”</p> <p>“if I play for more hours I become better musician”</p> <p>“to link success with social media profile”</p> <p>“experts in performing arts are not necessarily able to articulate what ‘successful’ means”</p>
	Stigma / “No pain, no gain” (2.2)	<p>“musicians’ collective confidence and their worry that speaking about performance anxiety might break the spell”</p> <p>“If I was good enough, I wouldn’t be getting nervous”</p> <p>“secrecy of suffering”</p> <p>“stay silent about difficulties”</p> <p>“If I talk about it, I’ll make it worse”</p> <p>“somebody else worse implies I am not as bad so don’t need help”</p> <p>“perception that pain means doing something wrong – many problems are preventable, very few have underlying causes”</p>
	Suffering for art / “They aren’t suffering, they’re talented” (2.2.1)	<p>“they aren’t suffering, they’re talented”</p> <p>“the mental health problems-creativity association”</p> <p>“myths of suffering for your art”</p> <p>“I am my instrument, therefore I primarily need to care for myself in the musical domain”</p> <p>“music making isn’t physical”</p>
	Musicians’ bubble / “If my teacher says it, it must be right” (2.3)	<p>“musicians aren’t like other people”</p> <p>“health practitioner has ‘magic hand’ and no work required from them”</p> <p>“unrealistic expectations contribute to mistrust of health professionals”</p> <p>“expect the experts to ‘fix the problems’ for them”</p> <p>“science cannot measure/capture art” “anyone in my industry knows better than very knowledgeable people outside my industry”</p> <p>“what works for me must work for you (e.g. conservatoire teachers for whom nothing ever went wrong)”</p> <p>“if my teacher says it, it must be right”</p> <p>“If deliverer of health advice isn’t a musician (embedded in the field), they might be dismissed”</p> <p>“in your field bias”</p> <p>“science students have issues too”</p>

Theme 3) The health education curriculum focuses on discussion around both content and the implications of health education as part of health promotion	health topics (subtheme 3.1)	mental health and warning signs; mindfulness and yoga; physical activity; injury management; practice skills and memorization; use of electronics; burnout; social determinants of health; managing relationships (and notably recognizing toxic relationships); eating disorders; substance abuse; recreation and play; financial education; loneliness and fear; emotional regulation; behaviour change; dealing with the media; time management and irregular schedules.
	functions of the course and delivery such as signposting, scope, relevance, pragmatism, and knowledge (3.2)	<p>“health course for all”</p> <p>“Delivery strategy impact[s] behavioural change”</p> <p>“frame fitness in terms of goals for musicians”</p> <p>“how music practice is done – a marathon not a sprint – should be ingrained”</p> <p>“be clear that health-related issues resolved serve the music”</p> <p>“delayed gratification, so health education might not benefit you now, but it will later”</p> <p>“musicians like practical”</p> <p>“to prioritise and find a balance: Knowing what would be “ideal” but also being realistic about what is possible within their lifestyle”</p> <p>“people anxious they are not meeting ideal”</p> <p>“Will musicians want to learn about biases?”</p> <p>“Evaluation of scenarios might be more appropriate”</p> <p>“Careful that information doesn’t lead to over-analysis”</p> <p>“inferred determinism – could they develop problems by learning about them?”</p> <p>“Implicit learning is facilitated by analogy”</p>
Theme 4) A settings-based approach to health focuses on a broader discussion of health promotion that took into consideration more systemic factors	the conservatoire culture and aims (4.1)	<p>“bubble of music institution”</p> <p>“study with musicians, live with musicians, socialize with musicians, do extra-curricular activities with musicians”</p> <p>“the institution’s resources reinforce musical activities”</p> <p>“need culture change to allow for wellbeing within wider performance practice time” [...] not just provide information”</p> <p>“hothouse for pressure, competition and perfectionism”</p> <p>“there are more people graduating from top conservatoire than there are jobs available in performance”</p> <p>“in what way is the educational establishment responsible for issues regarding this, e.g. job prospects, career worries, disappointment, overtraining, etc.”</p> <p>“no guarantee that hard work will pay off or that it is even relevant in 2018”.</p>

	<p>“conservatoire sector based on tradition – historically endorsed practices in tension with institutions as creative places”</p>
identity (4.2)	<p>“single identity”</p> <p>“when the instrument is taken away...who am I?”</p> <p>“if you're not a performer, who are you?”</p> <p>“to separate their self from their instrument”.</p> <p>“‘performer’ role could be widened to a more holistic idea of identity” which would also be “more robust if injury impacts one part”. “people are something beyond their instrument; sometimes people need to be enabled to find themselves – empower life beyond music”.</p> <p>“strict narrow self-definition can cause stress”</p> <p>“health professionals might see music as a ‘hobby’”</p> <p>“taught by people who are married to the job”</p>
pressure (4.3)	<p>“vulnerability is seen as weakness”</p> <p>“as a performer you're always looking to be better”</p> <p>“board members of conservatoires look at figures”</p>
the need to train the trainers (4.4)	<p>“Tutors never go to health-oriented offerings – just ‘jet into’ their lectures”.</p> <p>“hard to understand demands on freelancers’ time”</p> <p>“Online courses tailored to needs”</p> <p>“Online courses done as tick-box”</p> <p>“Annual music teacher awards, incentivizing measures ‘shine a light on good practice’”</p> <p>“need to develop teachers to learn pedagogy & best practices”. For example “MPA needs addressing as current instructors don't have experience of being taught about it – urgent”. “mental health first aid”</p> <p>“so teacher can make appropriate referrals when students are struggling”</p> <p>“Teacher could stop RSI by teaching time-management, stress reduction, etc”</p> <p>“would be most useful if teachers were taught about logical fallacies and biases so they understand the strategies for their own self-awareness and decision-making”</p> <p>“finger-pointing at music teachers”</p> <p>“work with them rather than brow-beat”</p> <p>“With regards to conservatoire the question arises: who reviews the ‘experts’? [. . .] If they were once experts, how do we know they still are currently?”</p>
the role of management and environmental restructuring (4.5)	<p>“how much time we can devote to health education and who is ultimately responsible for delivering this”</p> <p>“set expectations of health as a priority”</p> <p>“Good health literacy among students one thing but if directors don't know, working conditions suffer. [. . .] How many choral conductors know about posture?”</p> <p>“Reinforcing messages with structural changes to environment, e.g. Can't book practice rooms for 6 hours”</p> <p>“can students afford gym?”</p>

Supplemental Material S1. Discussion questions

Task. Cognitive biases, logical fallacies & critical appraisal tools

1. Are these concepts relevant to musicians' health and wellbeing?
2. Are there any concepts included that are NOT relevant to musicians' health and wellbeing?
3. Can you think of similar concepts that are missing?
4. Can you think of common health-related misconceptions that musicians might hold and that might need to be addressed/corrected?
E.g. 'I suffer from performance anxiety, therefore I must be a poor musician'.
E.g. 'No pain, no gain'.

