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Recent ndings in the literature suggest three factors may be particularly important in this relationship; personal music preferences, the content and structure of the music, and music emotion. Personal music preference is an important factor in the study of the bene cial e ects of music listening. Studies using participants' preferred music as opposed to music chosen for supposed inherent relaxing or calming characteristics have demonstrated positive e ects on pain tolerance and perception [24], reduced anxiety and increased relaxation [25], increased feelings of control over pain [26,27], and a decrease in agitated behaviour in older people with dementia [28]. Preferred music can evoke a state of balanced happiness in the listener [29]. However, key mechanisms in the positive e ects of preferred music listening are still not fully understood. Factors a ecting our relationship with our favourite music are myriad, and include personal meaning and memories associated with music [30], factors surrounding situational context, listener variables such as age, gender, occupation and identities [31]. Schubert et al. [32] have proposed that familiarity is key - the larger the number of factors which play a role in one's experience with a piece of music, the greater the positive aesthetic experience.

 e content and structure of music is another important factor in personal music preferences – for example preference for particular types or genres of music has been shown to be linked to identity and self-view [33]. However this is an area that is relatively ignored in relation to positive e ects of music listening, and there is some recent evidence that acoustical content of music plays a role in music choice for pain relief [34]. More speci cally the role of music content and how it dictates the emotion expressed by the music, has an in uence on its positive e ects [35]. Music emotion has been mooted as key to understanding how the relationship between the music stimulus and resulting response in the listener is mediated [9]. is encompasses mechanisms related to the structure of music. For example rhythmic entrainment, brain stem re ex, where basic acoustical characteristics of music cause corresponding activation of the central nervous system, and emotional contagion, where the listener mimics the mood expressed by a piece of music [36]. ese mechanisms have been shown to be factors in uencing emotions experienced through music listening, and may be related to the e ect of music upon stress levels [37]. us personal preference and music emotion are potentially important mediating factors in the positive e ects of music listening, and the content and structure of the music in turn plays a signi cant role in this relationship.

Music recommendation algorithms can be designed to take all of these factors into account. Analysis of listening preferences and information the user inputs into their music so ware can be used to create a detailed user pro le for the individual. A structured ontology can be created which describes the user, their music preferences, and the content of the music they choose [38]. User-speci c factors include personal and demographic information, familiarity with a given piece of music, personal associations and memories, subjective and semantic terms used to tag their music les and playlists. e content and structure of selected music can be analysed via metadata tags describing the genre and musical attributes of a given track. More detailed data can be extracted via analysis of the digital music le, resulting in a wide range of features related to musical dimensions such as dynamics, rhythm, timbre, pitch, tonality, and high level statistical and structure parameters [39]. In addition, music emotion can be accounted for via user-generated tags, or via classi cation of the emotion expressed by a piece of music by examining the acoustical content of the digital music le [34]. is data can be used as a basis for music-content based recommendation. If we have knowledge of the music an individual listens to for self-management of negative psychological factors and regulation of mood, we can examine the music content (acoustical content, metadata and expressed emotion), and use this data to identify similar music items which are then recommended to the user [40-42]. is approach can be extended to include aspects of the personal pro le of the individual – for example taking into account preference for music they are familiar with, or for which have particular personal associations. It is also possible to take into account potential similarities between individuals and their listening preferences. Collaborative ltering systems are based on the assumption that appropriate music recommendations can be made based on the preferences of others who may have similar personal pro les, or who listen to similar music for similar purposes [43]. us there are two key roles for the technology in this context: e rst is the ability to analyse an individual's music choices in unprecedented detail, and to further utilise this data to classify their music in terms of the emotion it expresses. e second is use of this data, along with a detailed user pro le, to create a personalised music playlist based around the needs and preferences of the individual.

In summary, there is a wealth of evidence supporting the positive e 1.5ABcts of tusic pistening pupo individual halth ond pwellbeng It ofrde

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