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Abstract

The COVID-19 pandemic influenced music therapists to migrate services to online platforms, though some lost clinical hours during the pandemic when telehealth was not a viable option. This survey study aimed to ascertain factors that helped music-based therapists to continue serving autistic clients over telehealth during the pandemic. We surveyed 193 accredited music therapists located mainly in Canada and the United States. In addition to gathering data on general perceptions of telehealth music therapy and Neurologic Music Therapy® (NMT), one-way ANOVAs were applied to determine differences in percent-change loss of clinical hours for music therapists: 1) working in different employment settings; 2) serving children, youth, adults, or a mixture of ages; and 3) practicing NMT or not. The general perception of telehealth music therapy was positive, and NMTs believed that the clear protocols and transformation design model were helpful to them in adapting services to telehealth. There were no significant differences in percent-change of clinical hours amongst music therapists in different employment settings, or serving different client age groups. Music therapists who said they practiced within the NMT treatment model lost a significantly lower percentage of clinical hours with autistic clients than those who did not practice NMT. Possible reasons for this result and the need for further research are discussed.

Keywords: neurologic music therapy, telehealth, autism, COVID-19, music therapy, virtual.

Effects of the COVID-19 Pandemic on Autistic Individuals

The 2019 coronavirus disease (COVID-19) pandemic and resulting lockdowns impacted the delivery of therapeutic services for autistic individuals[1] and their families or caregivers (White et al., 2020; White et al., 2021). Autism spectrum disorders (ASD) affect a large number of families. Autism is diagnosed in 1 in 38 eight-year-old children in the US and 1 in 50 children aged one to seventeen years in Canada (Centers for Disease Control and Prevention [CDC], 2022; Public Health Agency of Canada, 2019). A neurodevelopmental condition, autism impacts all aspects of functioning, including cognition, social interaction and communication, as well as sensorimotor control (American Psychiatric Association, 2013; Fournier et al., 2010). Many autistic individuals receive routine therapeutic services such as Applied Behaviour Analysis (ABA), occupational therapy, speech-language therapy, music therapy, and others. Because early-intervention is crucial for children on the spectrum, disruptions and delays in service for young children in particular can have a profound impact (Simacek et al., 2021). Disruptions in services caused a great deal of stress to autistic individuals and their families and caregivers due to disrupted routines (White et al., 2021).

Studies by White et al. (2020) and Ameis et al. (2020) detailed the ways in which these disruptions affected families with a child on the spectrum. In a survey of over 3000 caregivers of autistic individuals, White et al. (2020) found that about two-thirds of families reported disruption to therapeutic services because of the pandemic. Three-fourths of families reported experiencing extreme or moderate stress due to these disruptions. The majority of families surveyed in White et al.'s (2020) study reported worsening of autism symptoms in the child or adult in their care. Ameis et al. (2020) noted that being out of routine can increase anxiety for autistic people, while more time spent at home could create conditions conducive for more intensive focus on the same activities and interests. School closures may have created increased stress for some students on the spectrum who received needed supports through schools, although for others, it may have decreased stress if the social pressures and stimulation of school were

[1] To respect the desire of some autistic individuals to use identity-first language, and others for person-first language, we use both "autistic person" and "person on the spectrum" in this paper (Shakes & Cashin, 2019).

previously anxiety-provoking (Kalvin et al., 2021). The negative impact of service disruption for autistic persons and their families is concerning. Research is needed to identify how best to continue care for autistic individuals not only in a crisis like a pandemic, but also for those who may be in rural or remote areas with less access to therapy. Providing therapeutic and health-care services virtually has been increasingly researched as one solution to these issues, and telehealth is unlikely to disappear even as the COVID-19 pandemic decreases as a major threat to public health.

Transition of Music Therapy Services from In-Person to Telehealth

Though telehealth services were available for some therapies and services such as music therapy prior to the COVID-19 pandemic, the number of services that offer virtual options increased dramatically since 2020 (Cole et al., 2021; Gaddy et al., 2020; Solomon & Soares, 2020). Therapeutic services including music-based therapies made the transition to telehealth methods of delivery so that services could continue during the pandemic (Gaddy et al., 2020). Prior to the pandemic, telehealth music therapy was used to address mental health concerns in veterans in rural or remote areas (Levy et al., 2018; Lightstone et al., 2015; Spooner et al., 2019; Vaudreuil et al., 2020), to promote healthy interaction with children with hearing impairments and their families (Fuller & McLeod, 2019), to facilitate self-expression in an autistic young adult (Baker & Krout, 2009), and promote vocal health in older adults with Parkinson's Disease (Stegemöller et al., 2019).

The number of articles about telehealth music therapy increased steadily since the onset of the coronavirus pandemic (Kantorová et al., 2021). Studies included music therapists' reflections on their experiences transitioning from in-person therapy to telehealth in various settings including the neonatal intensive care unit (Negrete, 2020; Talmage et al., 2020), work with older adults (Wilhelm & Wilhelm, 2022), reports of music therapists providing telehealth care for health care professionals (Giordano et al., 2020; Rizkallah, 2020), practical suggestions for the successful transition to telehealth (Knott & Block, 2020), the impact of the pandemic on employment in music therapists (Gaddy et al., 2020), worldwide trends on use of telehealth music therapy (Clements-Cortés et al., 2023), and benefits and challenges of telehealth for neurologic music therapy® (NMT) services (Cole et al., 2021). Studies have uncovered

many positive aspects of telehealth music therapy, including accessibility for rural and remote clients, being able to continue sessions when sickness or inclement weather would prevent in-person sessions, decreased travel time for clients and/or therapists, and increased family/caregiver involvement (Cole et al., 2021; Fuller & McLeod, 2019). Drawbacks to telehealth include challenges with technology, audiovisual lag time when attempting music-making together, and sometimes difficulty developing a therapeutic relationship online (Cole et al., 2021; Fuller & McLeod, 2019; Kalvin et al., 2021).

While helpful, these studies are focused on telehealth in music-based therapies across clinical populations, and do not include substantial specific information on the efficacy of telehealth music therapy for autistic individuals. The current study thus aimed identify what factors may have aided the transition from in-person music therapy to telehealth specifically for autistic clients of music therapists. Qualitative results are reported in Richard Williams et al., (2022). To examine which factors were associated with a smoother transition to telehealth, the current study considered factors which may have influenced music therapists working with autistic clients to lose more or fewer clinical hours when transitioning from in-person sessions to telehealth. Gaddy et al. (2020) found that music therapists' place of employment impacted differences in clinical hour changes upon the onset of the pandemic, while Cole et al.'s (2021) study found no differences in the effect of employment settings on clinical hours. We therefore decided to investigate the relationship between employment setting and loss of clinical hours in the present study. Since White et al. (2020) reported that caregivers of children on the autism spectrum found that telehealth for various therapies was more difficult for younger children, we decided to investigate whether client age group impacted change in clinical hours over telehealth in music therapy. Finally, because Cole et al. found that therapists who more consistently used NMT techniques lost fewer group clinical hours over telehealth, and Kern and Tague (2017) found that NMTs had the highest rates of full-time employment amongst music therapists, we also investigated the effect of NMT status on clinical hours, and asked questions specifically to respondents indicating they practiced within an NMT approach about their perceptions of the adaptability of NMT to telehealth with autistic clients.

Neurologic Music Therapy®

There are many approaches and models within music therapy that this study could have compared. NMT is not an approach or model, but a system of evidence-based techniques built on advances in neuroscience and the understanding of the perception, production, and performance of music and how music can influence and change non-musical brain and behavior function. Due to previous evidence (Cole et al. 2021; Kern & Tague 2017), as well as the commitment of the researchers in this study to the NMT paradigm and to the dissemination of information related to the evidence-based practice of NMT and knowledge which contributes to professional development that ensure best practice in the field, it was a logical direction for the researchers to discuss and compare the relevance of NMT in the telehealth setting.

Research Questions

This survey study investigated four research questions: 1) What were board-certified music therapists and neurologic music therapists' perceptions of telehealth? 2) Were there differences in the average percent-change in clinical hours from in-person (i.e., pre-COVID-19) to telehealth (after onset of pandemic) between music therapists working in different employment settings? 3) Were there differences in the average percent-change in clinical hours from in-person (i.e., pre-COVID-19) to telehealth (after onset of pandemic) between music therapists working with different client age groups? 4) Were there differences in the average percent-change in clinical hours from in-person to telehealth between those who practiced neurologic music therapy or not? We hypothesized that: 1) The majority of participants would have a positive view of telehealth; 2) There would be no statistically significant difference in the percent-change of hours from in-person to telehealth between different employment settings; 3) those who worked primarily with children would have lost a significantly higher percentage of clinical hours from in-person to telehealth than with adults, youth, or those who work with a combination of ages; and 4) those who practiced NMT would retain more clients over telehealth than those who did not practice NMT, or who practiced only sometimes.

Methods

Participants

A total of 243 individuals responded to the survey and self-identified as fitting inclusion/exclusion criteria. The inclusion criteria were comprised of the following: therapists 1) had at least one client or group of autistic clients during 2020; 2) were accredited to practice music therapy in their region; 3) could read and understand English; and 4) were over the age of 18. Participants could withdraw from the survey at any time without penalty. Prior to completing the survey, participants read the inclusion/exclusion criteria and affirmed that they met criteria for the study by clicking corresponding checkboxes on the survey form. It was not possible to calculate an accurate response rate due to the multi-modal dissemination of the survey. Fifty respondents did not complete the survey up to and including the section reporting clinical hours so were excluded from analysis. One additional respondent was excluded for not fitting inclusion criteria. Data from 193 respondents were included in the descriptive analysis. An additional seven respondents were removed from the inferential analysis due to uninterpretable data since their pre-COVID hours were zero, rendering the equation to find the percent-change unusable. Thus, data from 185 respondents were included for the three ANOVAs. Specific data on socioeconomic status and race/ethnicity were not recorded. See Table 1 for information on study demographics.

[Insert Table 1]

Materials

We designed a 41-item survey (40 close-ended questions; one open-ended question) based in part on the survey used in Cole et al., 2021. Qualitative results from the open-ended question in this survey were reported in Richard Williams et al. (2022). The survey had nine sections: demographics, neurologic music therapy, effects of COVID-19, clinical practice, individual clients, group sessions, therapist experience, caregiver involvement, and future implications. In general, survey questions asked participants about their experiences in telehealth music therapy sessions with autistic clients after the onset of the pandemic, compared with in-person sessions before COVID-19 emerged. The survey was pilot tested with two board-certified music therapists who were not directly involved in the study. The survey was hosted on the online platform Survey Monkey. The set of questions regarding NMT practice with autistic clients via telehealth was made available to all participants who answered “yes” or

"sometimes" to the question "Do you practice within the neurologic music therapy [NMT] treatment model?" All of those who responded "no" to this question were automatically guided to the survey section after the NMT questions. A similar format was applied for the "individual clients" and "group sessions" sections, whereby only participants who stated that they had individual clients or group clients were then directed to fill out questions in the respective sections. Survey questions were mandatory, but participants could end their participation in the survey at any time without penalty. The survey is included in the supplementary material.

Data Collection

An invitation letter containing a link to the online survey was disseminated to music therapists via several avenues. The intention was to recruit English-speaking music therapists from as many countries as possible using the recruitment/advertising avenues offered by national and international music therapy bodies. One initial and two follow-up emails containing the invitation letter were sent to the 8975 board-certified music therapists with active memberships in the Certification Board of Music Therapy as of November 23, 2020. Additionally, the Canadian Association of Music Therapists shared the survey invitation to their members via one email (many of whom are also CBMT members); the World Federation of Music Therapy shared the invitation letter on their website; the British Association for Music Therapy shared the link in their newsletter, the European Music Therapy Confederation disseminated the letter to its members. The data collection period spanned from November 23 to December 23, 2020. The Research Ethics Board at the University of Toronto approved the study protocol.

Data Analysis

All statistical analyses were conducted in R (R Core Team, 2019). Results were determined significant at the alpha = 0.05 level.

Clinical Hour Differences in Employment Setting and Client Group

One-way ANOVAs were conducted to investigate possible differences in the average percent-change of clinical hours (from in-person to telehealth) between music therapists working in different employment settings or with different client age groups. The assumption of homogeneity of variance was

tested using Levene's Test. If the assumption for homogeneity of variance was not met, a Welch's ANOVA was used instead of a one-way ANOVA. Normality was checked using visual inspection of Q-Q plots. Employment setting was divided into the following categories: employed by institution, private practice employee, private practice subcontractor, private practice owner, and other, which included students, music therapy professors, and individuals in other unique workplaces. Client age group was divided into children (0-12 years old), adolescents (12-21 years old), adults (22 years and older), or combination of ages. The outcome variable, percent change in clinical hours, was calculated using the following formula:

$$\frac{\#\ of\ hours\ pre\ COVID\ -\#\ of\ hours\ post\ COVID}{\#\ of\ hours\ pre\ COVID}\ x\ 100$$

It is important to note that if a participant reported that they had zero clinical hours pre-COVID, their data was excluded from the analysis since is not possible to divide a number by zero.

Clinical Hour Differences Between NMTs and Non-NMTs

In terms of the effect of NMT practice, because the data failed Levene's test, indicating that variances were not homogenous, a Welch's ANOVA was conducted to investigate whether there were differences in the average percent-change in clinical hours upon the onset of the pandemic (Celik, 2020). NMT status was defined by participants' answers to the question "Do you practice within the neurologic music therapy model?" Answers included: yes, sometimes, or no. Significant results were further investigated using a Games Howell Test, a post-hoc test used to ascertain differences between means that does not assume homogeneity of variances (Games & Howell, 1976).

Community Involvement

Autistic community members (i.e., autistic persons, policy makers, agency leaders, or other community stakeholders) were not directly involved in the study design. Some survey participants self-identified as parents of autistic children.

Results

Participants' Perceptions of Telehealth

General Perceptions

Most survey participants had a positive view of telehealth. When invited to respond to the statement "I support the concept and value of telehealth" on a five-point Likert scale ranging from "strongly agree" to "strongly disagree," 84% of respondents said they either agreed or strongly agreed. 12% of participants said they neither agreed nor disagreed, and only 4% stated that they disagreed. Similarly, when asked to respond to the statement "My clients with ASD who have continued sessions over telehealth have continued to make progress in their goals and objectives," 80% of respondents said that they agreed or strongly agreed, while 16% neither agreed nor disagreed. 4% disagreed or strongly disagreed. These data indicate that most participants found telehealth music therapy valuable and perceived that their autistic clients had continued to progress in goals and objectives over telehealth. See Table 2.

[Insert Table 2 here]

Perceptions of Telehealth Relating to NMT

NMTs were asked "What are some of the benefits of having NMT training on your use of telehealth? (Check all that apply.)." Options for the answer were: Having specific (but adaptable) intervention protocols; access to local and global support meetings to help navigate transition to telehealth; NMT services viewed as valuable by employer/facility even over telehealth; I don't see a direct benefit of NMT on my telehealth work with clients with ASD; and Other (please specify)." 89% of NMTs checked "Having specific (but adaptable) intervention protocols" as a benefit, while only 9% of respondents stated that they did not see a direct benefit of NMT on their telehealth work. Of those who supplied answers in the "other" category, most referred to the clear research base and protocols for NMT, along with the six-step NMT thought process used to apply interventions to specific clinical situations. This process, called the "transformation design model," is a step-by-step procedure for the clinical NMT process (Thaut & Hoemberg, 2014). Descriptive results can be seen in Table 2 and Figure 1.

[Insert Figure 1]

Statistical Analysis

ANOVAs were performed to evaluate differences in the percent-change in clinical hours from in-person (pre-pandemic) to telehealth (onset of pandemic) for employment types, client age group, and NMT usage.

Clinical Hours in Employment Settings

A one-way ANOVA was performed to evaluate differences in the percent-change in clinical hours) between the employment types: employed by facility (medical or educational institution) (n = 62), private practice employee (n = 35), private practice owner (n = 47), subcontractor (n = 25), and other (students, educators, and others) (n = 16). Levene's test indicated that the assumption for homogeneity of variance was met, and Q-Q plot inspections indicated that the assumption for normality was met, excepting one extreme outlier that was left in the analysis because it was clinically relevant. A sensitivity analysis of the data was performed by removing the outlier and re-running each of the three analyses reported here, finding no difference in statistical significance for each result. No significant differences between the employment groups were found, $F(4,180) = 1.05$, $p = 0.38$, $n^2 = 0.06$. This finding is in concordance with our hypothesis that the different employment settings would lose a similar percentage of clinical hours. See Table 3.

[Insert Table 3]

Clinical Hours in Client Age Groups

A one-way ANOVA was performed to evaluate differences in the percent-change in clinical hours between the primary client age groups therapists were seeing in their practices: 1) children 0-12 years (n = 70), 2) adolescents 12-21 years (n = 37), 3) adults 22 years and older (n = 20), and 4) a combination of ages (n = 58). Levene's test indicated that the assumption for homogeneity of variance was met, and Q-Q plot inspections indicated that the assumption for normality was met except for one extreme outlier that was left in the analysis because it was clinically relevant. Contrary to our hypothesis, no significant differences were found in the change of clinical hours between these groups, $F(4, 180) = 0.248$, $p = 0.91$, $\eta 2 = 0.005$. See Table 3.

Clinical Hours in NMTs and Non-NMTs

Quantitative Analysis

A Welch's ANOVA was performed to evaluate differences in the percent-change in clinical hours between those who 1) practiced NMT (n = 31), did not practice NMT (n = 132), or sometimes practiced NMT (n = 24). Visual inspection of Q-Q plots indicated that the assumption for normality was met excepting one extreme outlier that was left in the analysis because it was clinically relevant. Figure 2 provides a visualization of the spread of the data.

The percent-change in clinical hours was significantly different between the three groups, $F(2,42) = 5.18$, $p = 0.01$, $\omega^2 = 0.03$. A post-hoc Games-Howell test found that those who practiced NMT lost a significantly lower percentage of hours (11.5%±31%) than those who did not practice NMT (31.1%±32.7%), p = 0.008. Thus, our hypothesis that those who practiced NMT consistently would have retained more clinical hours than those who did not practice NMT was confirmed. In contrast, our hypothesis that there would be a significant difference in percentage of clinical hours lost between music therapists who practiced NMT sometimes compared to those who practiced it consistently was not supported: No significant differences were found between these two groups. See Table 3.

[Insert Figure 2]

Discussion

This study received 243 responses, of which 185 had usable data for quantitative analysis. Since a precise response rate is not known, the validity and generalizability of the data is limited, and results must be interpreted with caution. In the current study, most respondents had a positive view of telehealth and believed that their clients on the spectrum had continued to make progress even when sessions were not in-person. These results echo those of Cole et al. (2021), Kantorová et al. (2021), and Knott and Block (2020) who broadly found that telehealth was an effective (though not perfect) strategy to continue to bring music therapy to clients when in-person services were not possible due to lockdowns and health-risks during the pandemic. In terms of the implementation of telehealth for autistic clients specifically, qualitative results published elsewhere from the survey in the current study Richard Williams et al. (2022) found that clients who tended to engage well in telehealth had many of the following factors in common:

they were familiar with screens, had access to technology and internet, had calm places of residence with few distractions, may have struggled with social anxiety when in-person, had fewer sensory needs or had a caregiver present, and could attend to a screen. Participants' generally positive experiences of telehealth articulated in the current study, together with other research on the benefits of telehealth music therapy (Cole et al. 2021; Richard Williams et al., 2022) indicates that telehealth is a tool that should not be completely abandoned even as in-person music therapy sessions have again become the norm.

Employment and Client Age Effects

We found that employment settings did not make a statistically significant difference in the change in clinical hours from pre-COVID to after the onset of the pandemic. In other words, music therapists with autistic clients working as private practice owners, private practice employees, subcontractors, those working in educational or health-care facilities, and those in other settings (such as educational settings) lost, on average, similar percentages of clinical hours when the pandemic began. These findings echo those of Cole et al. (2021) who found that employment setting did not make a statistically significant difference in terms of change in number of clinical hours from in-person (pre-pandemic) to telehealth.

In contrast, Gaddy et al. (2020) found that music therapists working in private practice had the highest rates of decreased income, compared to those working as therapists in schools or health-care settings, or those working in universities. The current study did observe that music therapists working in private practice as business owners or employees lost a higher percentage of clinical hours than those working in facilities; however, these differences were not statistically significant. The discrepancy in findings between the studies may be due to a few factors: Gaddy et al. used categorical outcome measures (full pay, partial pay, no pay, etc.) whereas our outcome measure was continuous (i.e., estimates of clinical hours in-person and telehealth). The current study also had fewer categories as far as workplace than Gaddy et al. Finally, while Gaddy et al.'s study looked at music therapists working with the full variety of clinical populations, ours was limited to those working with autistic clients. The differences in

population of interest, categories included, and outcome variable likely influenced the differences between the current study's findings and those of Gaddy et al.

Contrary to our hypothesis, the primary age group of clients also did not seem to affect the percentage of clinical hours lost when the pandemic happened. In the transition to telehealth, one might expect that it could be more difficult to work with young children via online formats than adolescents or adults given the developmental differences in attention span between younger and older individuals (White et al., 2020). The differences between the current findings and those of White et al. (2020) may be because the current study was music therapy specific, while White et al. reported on telehealth experiences of various therapies in general for autistic children. It may be that the engaging nature of music therapy makes it more adaptable for online formats, or that the inclusion of caregivers made work with younger clients possible. It is also possible that very young children (e.g., one to six years of age) had different levels of engagement with telehealth than older children (e.g., seven to twelve years of age), given the developmental changes that take place in the first twelve years of life. The effects of developmental age on telehealth engagement in autistic children would be a valuable topic for future research.

A Neurologic Music Therapy Effect

Though differences in employment setting and client age group were not associated with different degrees of loss of clinical hours, whether one practiced NMT consistently or not at all was related to loss of clinical hours. Those who reported practicing NMT lost a significantly lower percentage of clinical hours than those who said they did not practice NMT. This result provides additional evidence supporting the results in previous research by Cole et al. (2021) which found that NMTs who practiced consistently within the NMT model lost fewer group clients upon the onset of the pandemic than those who only used NMT sometimes. As well, previous research found that although NMTs comprise a small percentage of music therapists worldwide, they have the highest rate of full-time employment than music therapists practicing any other approach (Kern & Tague, 2017).

Possible Interactions

Though place of work or age of clients did not have a statistically significant effect independently, it is possible that these factors could comprise underlying influences that could explain differences in percent-change of clinical hours between those practicing and not practicing NMT. For example, Gaddy et al. (2020) found that music therapists working in private practice were disproportionately affected by the pandemic in contrast to those working in facilities. If NMTs were more likely than non-NMTs to work at institutions than in private practice, then the place of work, rather than the paradigm, could be driving any difference in clinical hours. Similarly, White et al. (2021) discussed that telehealth was particularly difficult for autistic children. If children particularly struggled to engage online, it is possible that if more non-NMTs were working with children than NMTs, the age distribution of clients could be an influencing factor in clinical hours losses. Though sample sizes did not allow the current study to run a factorial ANOVA to directly investigate this question, interactions seem unlikely given the data.

In terms of employment, Table 4 shows that the NMT and non-NMT categories have very similar percentages of those working in private practice as well as facilities. Given these similar ratios in the data from the current study, it does not seem likely that place of work was the driving factor behind loss of clinical hours among the different NMT categories. Those who practiced NMT sometimes had a higher proportion of facility jobs than the other categories; however, there were no statistically significant differences between the *sometimes* category and either the *yes* or *no* categories in Welch's ANOVA.

In terms of client ages, raw count data in Table 4 seem to indicate that a lower percentage of NMTs than non-NMTs worked exclusively with children, though a higher percentage of NMTs than non-NMTs worked with a mixture of ages, which would include children. In other words, both NMTs and non-NMTs worked with children, whether exclusively or along with clients in other age groups. Additional data would need to be collected to analyze how much of a role the age of clients played in the retention of clinical hours during the COVID-19 pandemic. Nevertheless, these current findings are in keeping with previous research, which found that music therapists successfully transitioned sessions to telehealth with a variety of age groups (Cole et al., 2021).

In terms of therapist ages, raw count data in Table 4 seem to indicate that similar (though not identical) age group proportions of music therapists who practiced NMT, who sometimes practiced NMT, and who did not practice NMT. It is reasonable to assume that younger therapists with more technology experience may have transitioned to telehealth more easily than older music therapists, for some of whom the learning curve of technology could have posed more of a challenge due to lack of experience. Further data analysis on a larger sample size would have been needed to ascertain whether variations in therapist age amongst different NMT categories may have influenced the ability to transition clinical hours to telehealth.

Interpretation of NMT Results

Im

Implications for Future Research and Practice

This study indicates that NMTs retained a higher percentage of clinical hours than their non-NMT music therapy colleagues during the pandemic. The reasons for this finding are not fully known, and merit deeper investigation. NMTs in the current study believed that having clear protocols and a methodical model for designing interventions helped them to work with individuals over telehealth. The effects of having access to clear intervention protocols is an important concept for future research. Robb et al.'s (2018) analysis of music therapy literature led them to conclude that the field of music therapy in general does not have a consistent body of specific interventions, rarely articulates the theoretical framework underpinning interventions in published research, lacks cohesive standards for mode of delivery of interventions, and does not use consistent language to describe the components of interventions. The many approaches and methods within the broad field of music therapy could be seen as evidence for the boundless creativity that practitioners use to meet the needs of clients, but Robb et al.'s research provides a more critical perspective, stating that the lack of cohesiveness causes confusion, inconsistency, and lack of replicability in research.

What effect does the lack of cohesive theory, modes of delivery, interventions, and language (Robb et al., 2018) have on music therapists, particularly when they need to adapt their practice suddenly,

such as during the pandemic? Future research should investigate why the current study, Kern and Tague (2017), and Cole et al. (2021) all found that those practicing NMT tended to have the highest level of clinical hours. Descriptive results from the current study, as well as the observations of Robb et al. (2018) indicate that cohesive language, theory, protocol, and standards of practice merit investigation as a possible causal factor, alongside other factors such as place of employment and age of clientele.

Limitations

This survey's response rate is not known which limits the study's validity and generalizability. One potential reason for the fairly low number of responses is survey fatigue. The survey was disseminated at a time when many research surveys were being sent to music therapists due to restrictions on in-person research due to COVID-19 lockdowns, perhaps influencing some eligible participants to ignore requests for surveys. Other possible reasons for low response numbers are because the survey was in English only, which perhaps limited responses outside English-speaking countries, and because it was not possible to directly contact music therapists outside of the United States and Canada to send reminder emails. The low responses may also be because the number of those invited to participate was likely far more than the number of individuals eligible for the study: Participants had to have seen at least one autistic music therapy client in 2020.

NMTs were asked "What are some of the benefits of having NMT training on your use of telehealth?" while non-NMTs who answered the survey were not asked an equivalent question about the effects their music therapy training or other trainings had on their use of telehealth. The lack of equivalent question is a design flaw that may have biased the balance of discussion in this paper towards NMT. There is a missed opportunity to find out how music therapists with varying training backgrounds other than NMT utilized their expertise to make telehealth benefit their autistic clients during the pandemic. The results describing how NMTs viewed the impact of their training thus lack context and should be interpreted cautiously. In addition, the question regarding the benefits of NMT training was a "select all that apply" question with suggested answers along with an open-ended "other" option. This may have limited the content of responses rather than if this question had been an open-ended qualitative question.

Importantly, however, several participants filled in the "other" category by mentioning the helpfulness of the transformational design model, which was not listed on the list. This indicates that despite the presence of some suggestions, respondents still thought critically about the question and answered it from their own experience.

Other limitations include lack of measure of client progress from the perspective of clients themselves or their caregivers. Future studies should examine perspectives of telehealth music therapy from autistic clients' (and their caregivers') perspectives.

Conclusion

Overall, participants in the study viewed telehealth positively, and most saw their autistic clients continue to make progress towards goals and objectives over telehealth. Place of employment and age group of autistic clients served did not have a significant impact on retention or loss of clinical hours from in-person to telehealth when the COVID-19 pandemic happened. Neurologic music therapists lost fewer clinical hours than those who did not practice neurologic music therapy. The reasons for this difference between NMT and other approaches are unknown but merit future investigation. As telehealth becomes a standard aspect of practice in music therapy, it is important to identify aspects of music-based therapy paradigms are most translatable to telehealth music therapy. For example, the presence of audio latency has made techniques involving live music-making virtually impossible; however, there is excellent research happening by Fuller (2023) on the use of technology devices that essentially eliminate the perception of latency during live music-making over telehealth. This indicates that even approaches and techniques that rely heavily on simultaneous music-making have the potential to translate to telehealth. Even as advances are being made on the technological side, it is important to acknowledge that connecting with clients via video-chat adds a completely new element to the therapeutic setting and relationship. More rigorous research is needed to identify how music therapists practicing in various approaches or paradigms can best to carry out telehealth music therapy for clients with a variety of needs.

References

Ameis, S. H., Lai, M.-C., Mulsant, B. H., & Szatmari, P. (2020). Coping, fostering resilience, and driving care innovation for autistic people and their families during the COVID-19 pandemic and beyond. *Molecular Autism*, *11*, 61. https://doi.org/10.1186/s13229-020-00365-y

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders.* (5th edition). https://doi.org/10.1176/appi.books.9780890425596

Baker, F., & Krout, R. (2009). Songwriting via Skype: An online music therapy intervention to enhance social skills in an adolescent diagnosed with Asperger's Syndrome. *British Journal of Music Therapy, 23*(2), 3–14. https://doi.org/10.1177/135945750902300202

Health Canada. (2006, June 29). *Information Management and Technology* [Transparency - other]. Retrieved from https://www.canada.ca/en/health-canada/services/health-care-system/reports-publications/primary-health-care/information-management-technology.html

Celik, N. (2020). Welch's ANOVA: Heteroskedastic skew- *t* error terms. *Communications in Statistics - Theory and Methods*, 1–12. https://doi.org/10.1080/03610926.2020.1788084

Centers for Disease Control and Prevention. (2023, April 4). *Data and Statistics on Autism Spectrum Disorder.* Centers for Disease Control and Prevention. https://www.cdc.gov/ncbddd/autism/data.html

Clements-Cortés, A., Pranjić, M., Knott, D., Mercadal-Brotons, M., Fuller, A., Kelly, L., Selvarajah, I., et al. (2023). International music therapists' perceptions and experiences in telehealth music therapy provision. *International Journal of Environmental Research and Public Health*, *20*(8), 5580. http://dx.doi.org/10.3390/ijerph20085580

Cole, L. P., Henechowicz, T. L., Kang, K., Pranjić, M., Richard, N. M., Tian, G. L. J., & Hurt-Thaut, C. (2021). Neurologic music therapy via telehealth: A survey of clinician experiences, trends, and recommendations during the COVID-19 pandemic. *Frontiers in Neuroscience*, *15:*648489. doi: 10.3389/fnins.2021.648489

Fournier, K. A., Hass, C. J., Naik, S. K., Lodha, N., & Cauraugh, J. H. (2010). Motor coordination in autism spectrum disorders: A synthesis and meta-analysis. *Journal of Autism and Developmental Disorders*, *40*(10), 1227–1240. https://doi.org/10.1007/s10803-010-0981-3

Fuller, A. M. (2023, July 29). Paper Session 83: Next steps in innovative low-latency technologies for online synchronous music therapy delivery [Conference Presentation]. World Congress of Music Therapy, Vancouver, BC, Canada. https://www.wcmt2023.org/wp-content/uploads/2023/07/WCMT-2023-Program-Book.pdf

Fuller, A. M., & McLeod, R. G. (2019). The Connected Music Therapy Teleintervention Approach (CoMTTA) and its application to family-centred programs for young children with hearing loss. *Australian Journal of Music Therapy*, *30*, 12–30. Retrieved from https://www.austmta.org.au/journal/article/connected-music- therapy-teleintervention-approach-comtta-and-its-application-family

Gaddy, S., Gallardo, R., McCluskey, S., Moore, L., Peuser, A., Rotert, R., Stypulkoski, C., & LaGasse, A. B. (2020). COVID-19 and music therapists' employment, service delivery, perceived stress, and hope: A descriptive study. *Music Therapy Perspectives*, *38*(2), 157–166. https://doi.org/10.1093/mtp/miaa018

Games, P. A., & Howell, J. F. (1976). Pairwise multiple comparison procedures with unequal N's and/or variances: A Monte Carlo study. *Journal of Educational Statistics*, *1*(2), 113–125. https://doi.org/10.3102/10769986001002113

Giordano, F., Scarlata, E., Baroni, M., Gentile, E., Puntillo, F., Brienza, N., & Gesualdo, L. (2020). Receptive music therapy to reduce stress and improve wellbeing in Italian clinical staff involved in COVID-19 pandemic: A preliminary study. *The Arts in Psychotherapy*, *70*, 101688. https://doi.org/10.1016/j.aip.2020.101688

Kalvin, C. B., Jordan, R. P., Rowley, S. N., Weis, A., Wood, K. S., Wood, J. J., Ibrahim, K., & Sukhodolsky, D. G. (2021). Conducting CBT for anxiety in children with autism spectrum disorder during COVID-19 pandemic. *Journal of Autism and Developmental Disorders, 1*, 1-9. https://doi.org/10.1007/s10803-020-04845-1

Kantorová, L., Kantor, J., Hořejší, B., Gilboa, A., Svobodová, Z., Lipský, M., Marečková, J., et al. (2021). Adaptation of music therapists' practice to the outset of the COVID-19 pandemic—going virtual: A scoping review. *International Journal of Environmental Research and Public Health, 18*(10), 5138. http://dx.doi.org/10.3390/ijerph18105138

Kern, P., & Tague, D. B. (2017). Music therapy practice status and trends worldwide: An international survey study. *Journal of Music Therapy*, *54*(3), 255–286. https://doi.org/10.1093/jmt/thx011

Knott, D., & Block, S. (2020). Virtual music therapy: developing new approaches to service delivery. *Music Therapy Perspectives*, *38*(2), 151–156. https://doi.org/10.1093/mtp/miaa017

Levy, C. E., Spooner, H., Lee, J. B., Sonke, J., Myers, K., & Snow, E. (2018). Telehealth-based creative arts therapy: Transforming mental health and rehabilitation care for rural veterans. *The Arts in Psychotherapy*, *57*, 20–26. https://doi.org/10.1016/j.aip.2017.08.010

Lightstone, A. J., Bailey, S. K., & Voros, P. (2015). Collaborative music therapy via remote video technology to reduce a veteran's symptoms of severe, chronic PTSD. *Arts & Health*, *7*(2), 123–136. https://doi.org/10.1080/17533015.2015.1019895

Negrete, B. (2020). Meeting the challenges of the COVID-19 pandemic: Virtual developmental music therapy class for infants in the neonatal intensive care unit. *Pediatric Nursing, 46*(4), 5.

Public Health Agency of Canada. (2022). *Autism spectrum disorder: Highlights from the 2019 Canadian health survey on children and youth.* Retrieved from https://www.canada.ca/content/dam/phac-aspc/documents/services/publications/diseases-conditions/autism-spectrum-disorder-canadian-health-survey-children-youth-2019/autism-spectrum-disorder-canadian-health-survey-children-youth-2019.pdf

R Core Team. (2019). *R: The R Project for Statistical Computing*. https://www.r-project.org/

Richard Williams, N. M., Hurt-Thaut, C., & Thaut, M. H. (2022). Novel screening tool and considerations for music therapists serving autistic individuals via telehealth: Qualitative results from a survey of clinicians' experiences, *Journal of Music Therapy,* 59(4), 368–393. https://doi.org/10.1093/jmt/thac009

Rizkallah, M. (2020). The North London Music Therapy Phone Support Service for NHS staff during the COVID-19 pandemic: A report about the service and its relevance for the music therapy profession. *Approaches: An Interdisciplinary Journal of Music Therapy,* 1-8. Retrieved from http://approaches.gr/wp-content/uploads/2020/11/Approaches-FirstView-r20201110-Rizkallah.pdf

Robb, S. L, Hanson-Abromeit, D, May, L., Hernandez-Ruiz, E., Allison, M., Beloat, A., Daugherty, S., Kurtz, R., Ott, A., Oyedele, O. O., Polasik, S., Rager, A., Rifkin, J., & Wolf, E. (2018). Reporting quality of music intervention research in healthcare: A systematic review. *Complementary Therapies in Medicine,38,* 24-41.https://doi.org/10.1016/j.ctim.2018.02.008.

Shakes, P., & Cashin, A. (2019). Identifying language for people on the autism spectrum: A scoping review. *Issues in Mental Health Nursing, 40*(4), 317–325. https://doi.org/10.1080/01612840.2018.1522400

Simacek, J., Elmquist, M., Dimian, A. F., & Reichle, J. (2021). Communication interventions for young children with or at risk for autism spectrum disorder. *Current Developmental Disorders Report*, *8*, 15–23. https://doi.org/10.1007/s40474-020-00214-w

Solomon, D., & Soares, N. (2020). Telehealth approaches to care coordination in autism spectrum disorder. In *Interprofessional Care Coordination for Pediatric Autism Spectrum Disorder*. Springer Nature. https://doi.org/10.1007/978-3-030-46295-6_19

Spooner, H., Lee, J. B., Langston, D. G., Sonke, J., Myers, K. J., & Levy, C. E. (2019). Using distance technology to deliver the creative arts therapies to veterans: Case studies in art, dance/movement and music therapy. *The Arts in Psychotherapy*, *62*, 12–18. https://doi.org/10.1016/j.aip.2018.11.012

Stegemöller, E. L., Diaz, K., Craig, J., & Brown, D. (2019). The feasibility of group therapeutic singing telehealth for persons with parkinson's disease in rural Iowa. *Telemedicine and E-Health*, *26*(1), 64–68. https://doi.org/10.1089/tmj.2018.0315

Talmage, A., Clulee, M. B. C., Cho, H., Glass, M., Gordon, J., Kong, J. C., Hoskyns, S., Hunt, B. J., Jeong, A. A. Y., Johns, L., Hunt, E. L., Matthews, E., Rickson, D., Landreani, C. R., Sabri, S., & Solly, R. (2020). Music therapy in a time of pandemic: Experiences of musicking, telehealth, and resource-oriented practice during COVID-19 in Aotearoa New Zealand. *The New Zealand Journal of Music Therapy*, *18*, 7–66.

Thaut, M., & Hoemberg, V. (Eds.). (2014). *Handbook of neurologic music therapy*. New York, NY: Oxford University Press.

Thaut, M. H., McIntosh, G. C., & Hoemberg, V. (2016). In M. H. Thaut & V. Hoemberg, (Eds.), *Handbook of Neurologic Music Therapy* (pp. 1-6)., Oxford University Press.

The Academy of Neurologic Music Therapy. (n.d). *Key elements of the NMT evidence-based model.* The Academy of Neurologic Music Therapy. https://nmtacademy.co/key-elements-of-nmt/

Vaudreuil, R., Langston, D. G., Magee, W. L., Betts, D., Kass, S., & Levy, C. (2020). Implementing music therapy through telehealth: Considerations for military populations. *Disability and Rehabilitation: Assistive Technology*, 1–10. https://doi.org/10.1080/17483107.2020.1775312

White, L. C., Law, J. K., Daniels, A. M., Toroney, J., Vernoia, B., Xiao, S., The Spark Consortium, Feliciano, P., & Chung, W. (2020). Brief report: Impact of COVID-19 on individuals with ASD and their caregivers: A perspective from the SPARK cohort. *Journal of Autism and Developmental Disorders*. https://doi.org/10.1007/s10803-020-04816-6

White, S. W., Stoppelbein, L., Scott, H., & Spain, D. (2021). It took a pandemic: Perspectives on impact, stress, and telehealth from caregivers of people with autism. *Research in Developmental Disabilities, 113,* 103938. https://doi.org/10.1016/j.ridd.2021.103938

Wilhelm, L., & Wilhelm, K. (2022). Telehealth music therapy services in the United States with older adults: A descriptive study. *Music Therapy Perspectives, 40*(1), 84–93. https://doi.org/10.1093/mtp/miab028

Table 1

Sociodemographic Characteristics of Participants

Characteristic	*n*	*%*
Age		
18-24	17	9.2
25-34	79	42.7
35-44	31	16.8
44-54	29	15.7
55+	29	15.7
Country		
United States	159	85.9
Canada	23	12.4
Chile	1	0.5
Singapore	1	0.5
Taiwan	1	0.5
Sex		
Male	17	9.2
Female	168	90.1
Education		
Bachelor’s degree	91	49.2

Master's degree	78	42.2
PhD	8	4.3
Other	8	4.3
Additional Training		
Occupational therapy	3	1.6
Special education	35	18.9
Applied Behaviour Analysis (ABA)	28	15.1
DIR Floortime	13	7.0
Neurologic Music Therapy	55	29.7
Other (e.g., speech-language therapy, counseling/psychotherapy, parent of autistic child, other autism trainings.)	24	13.0

	Range	*M*	*SD*
Years of music therapy practice	0 – 50	12.5	12.2
Years of experience with autistic clients	0 – 50	10.7	10.4

Table 2

Descriptive Results of Participants Perceptions of Telehealth

Category	*n*	*%*
I support the concept and value of telehealth (N = 193)		
Strongly Agree	90	48.6
Agree	73	39.5
Neither Agree nor Disagree	23	12.4
Disagree	7	3.8
Strongly Disagree	0	0
My clients with ASD who have continued sessions over telehealth have continued to make progress in their goals and objectives (N = 193)		
Strongly Agree	53	2.6
Agree	101	54.6
Neither Agree nor Disagree	31	16.8
Disagree	7	3.8
Strongly Disagree	1	0.5
What are some of the benefits of having NMT training on your use of telehealth? (N = 56)		

Having specific (but adaptable) intervention protocols	49	87.5
Access to local and global support meetings	13	23.2
NMT services viewed as valuable by employer/facility	19	33.9
No direct benefit of NMT on telehealth work with autistic clients	5	8.9
Other	7	12.5
Using the transformational design model/framework	2	3.6
Research-based	2	3.6
Protocols are clear	1	1.8
Spurious comments	2	3.6

Table 3

Means, Standard Deviations, and Analyses of Variance or Employment, Age Group Served, and Neurologic Music Therapy Usage

Measure	*n*	Percent-Change		*F*(4,180)	η^2
		M	*SD*		
Employment				1.05	0.06
Employed by Facility	62	-21.2	35.5		
Private Practice Employee	35	-31.3	29.2		
Private Practice Owner	47	-32.1	34.5		
Private Practice Subcontractor	25	-11.4	91.7		
Other	16	-25.6	46.6		
Primary Age Group Served				0.248	0.005
Children 0-12 years old	70	-21.7	62.5		
Youth 12-21 years old	37	-29.1	32.3		
Adults 22+ years old	20	-26.6	45.4		
Combination of ages	58	-25.6	31.6		
				F(2,42)	ω^2
Neurologic Music Therapy				5.18*	0.03
Yes	31	-11.5	31.0		
No	132	-31.1	32.7		

Sometimes	24	-9.1	97.9

*$p = 0.01$

Table 4
Number of NMTs by Employment, Client Age, and Therapist Age Categories

Category	NMT - Yes		NMT - Sometimes		NMT - No	
	n	*%*	*n*	*%*	*n*	*%*
Place of Employment						
Institution/Facility	10	32.2	13	54.1	39	30
Private Practice	18	60	9	37.5	80	61.5
Other	3	9.7	2	8.3	11	8.5
Client Ages						
Children (0-12)	7	22.6	10	41.7	53	40.8
Adolescents (12-21)	7	22.6	6	25	24	40.7
Adults (22+)	4	12.9	1	4.2	15	11.5
Combination of Ages	13	41.9	7	29.2	38	29.2
Therapist Ages						
18-24	2	6.4	2	8.3	15	11.5
25-34	16	51.6	9	37.5	57	43.8
35-44	4	12.9	4	16.7	24	18.5
45-54	7	22.5	4	16.7	19	14.6
55-64	2	6.5	3	12.5	17	13.1
65+	0	0	3	12.5	5	3.8

Figure 1

NMTs' Perceptions of NMT Benefits on Telehealth

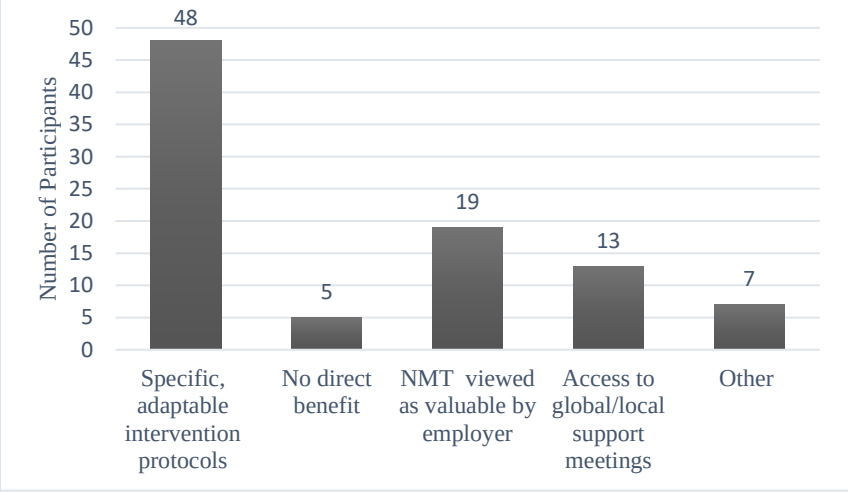
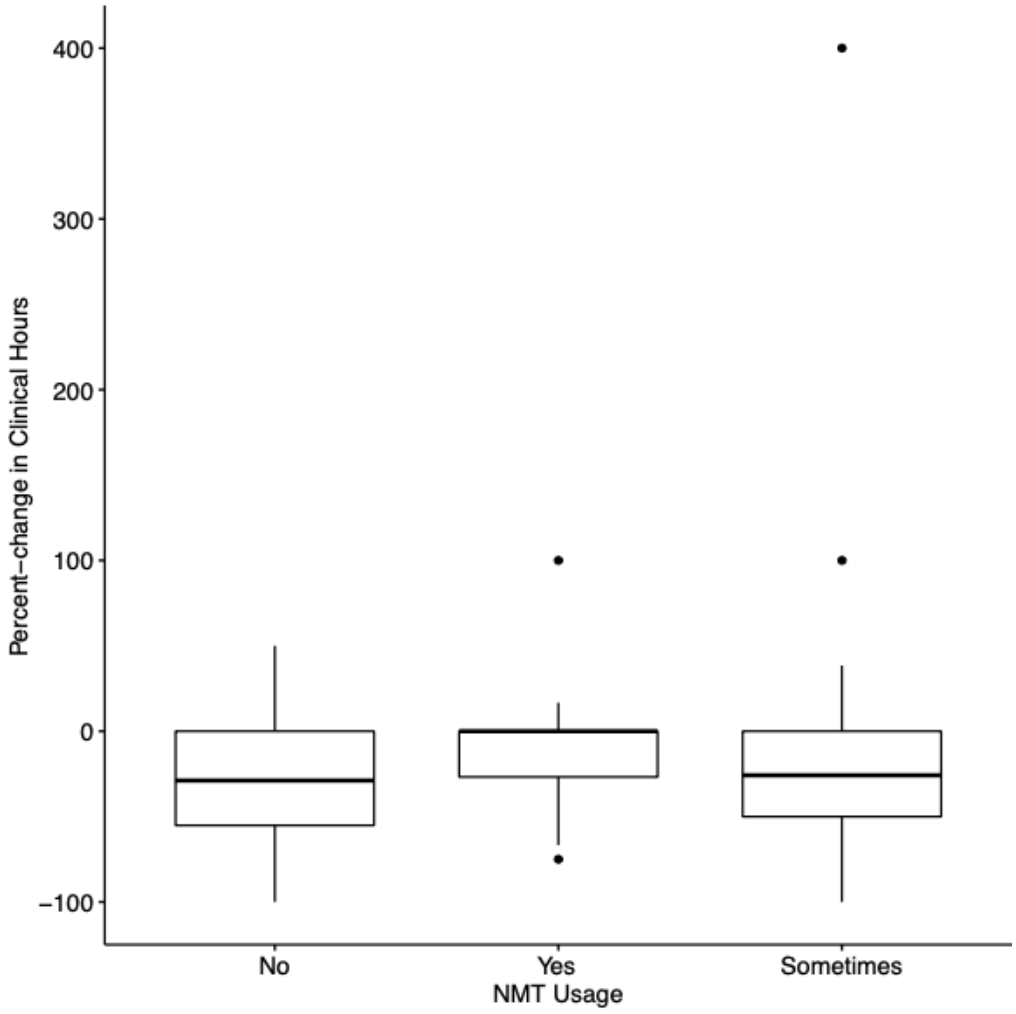


Figure 2

Boxplot of Percent Change in Clinical Hours by NMT Status



Note: Group sizes were: No = 130, Yes = 31; Sometimes = 24