Content Analysis of Specialist Interviews in the Development of the Music Therapy Activity System

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Abstract. The study aims to define the needs and specification of a music therapy system based on music therapy programs designed for elderly dementia patients. The mobile music therapy system proposed from this study will allow music therapy to no longer be restricted by location, time, and instrument needs, while at the same time preserving the emphasis of music therapy on personalization, wide choice, and options of both active and passive activities. In order to evaluate whether the designed activities meet the needs of dementia patient and their caregivers, the present study utilized a semi-structured interview format to collect perspectives from three different music therapists on the system; the vocabulary content of the responses were then subjected to linguistic analysis to determine the suitability of the system structure for user needs. The results demonstrated that music therapists approved of the system functions and confirmed its suitability for its target populations.

Keywords: content analysis, dementia, elderly, music therapy, system.

1   Introduction

Dementia is a common condition among the elderly and includes symptoms of memory loss and mood instability, among others. In addition to medical therapy for symptomatic control, music therapy is a common alternative mode of treatment. It has the benefit of significantly improving the memory loss and mood problems that dementia patients suffer from. However implementations of music therapy are too often restricted by time, space, instrument supply, and human resources. Due to these limitations, music therapy has yet to become broadly integrated into the lives of dementia patients. While music therapy can effectively halt the memory loss process and improve mood in dementia patients, it is limited by the fact that it requires an experienced therapist and multimedia tools, and as such cannot be implemented widely amongst dementia patients. Therefore, the current research combined current music therapy practices and modern technologies in the hopes of integrating and producing a novel system to facilitate the implementation of musical therapy.

The goal of music therapy is to improve an individual's symptoms through the involvement of music. The emphasis is not on advancing specialist, music-theoretical

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knowledge, but rather on the reactions elicited in patients and whether clinical symptoms improve as a result. At present, music therapy is commonly delivered either individually or in a group setting. Group therapy has the benefit of increasing social interactions amongst dementia patients, while individual therapy can be tailored to each patient's special needs. In dementia patients, the typical responses observed are smiling and singing along to songs from earlier in their lives [1]. Even with memory loss, it appears that memories of music persist [2], highlighting the relative importance of the demand for individualized therapy sessions.

Music therapy has been shown to effectively improve memory [3], mood stability [4], and family interactions amongst dementia patients. But considering music therapy's emphasis on individualization, it must provide multiple options to patients and allow a combination of active and passive modes of delivery. Also relevant are the need for flexibility in activity content and the complex planning bridging content design and therapy delivery. At present, there are many obstacles in expanding implementations of music therapy from the settings of nursing homes and hospitals to those with families and at other locations, which can maximize the opportunities for interaction between patients and their family members and friends.

The present study aims to define the needs and specification of a music therapy system based on music therapy programs designed for elderly dementia patients. It utilizes current music therapy practices as its structure, and consolidates complex procedures and multimedia tools into a music therapy system. In order to evaluate whether the designed activities meet the needs of dementia patient and their caregivers, a semi-structured interview format to collect perspectives from three different music therapists on the system was conducted; the vocabulary content of the responses were then subjected to linguistic analysis to determine the suitability of the system structure for user needs. This paper is organized as follows: section II describes the music therapy activities system; section III elaborates on the content analysis of specialist interviews; and finally, sections IV and V introduce discussion and conclusions.

2   Music Therapy Activities System (MTAS) Description

We confirmed the goals of our system design through literature review, and demonstrate commonly used music therapy practices for dementia patients in the flow diagram below. The yellow parts indicate the scope of MTAS as designed in the present study, while the other areas represent individual evaluations carried out by music therapists (Figure 1).

The system design is based on commonly used music therapy activities targeting dementia patients, including activity items, song lists, and instruments. Activity design accommodates both active and passive forms of delivery: active forms include playing an instrument and singing along to a song, while passive forms include music appreciation, with the option of a guessing a song's name at its conclusion. Each activity has a role in alleviating clinical symptoms. For example, music appreciation can utilize songs from the patient's youth or tailored to their interests and mood. Instrument playing can be divided into polyphonic, monophonic, and percussion instruments, chosen based on user interests.
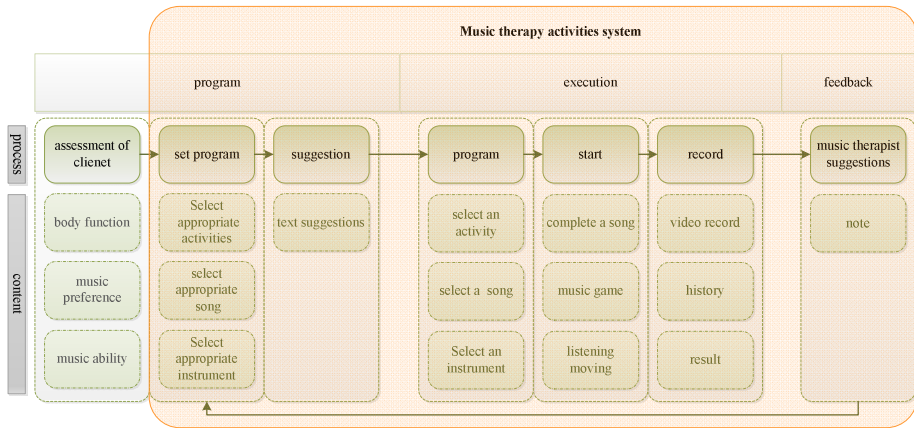
Fig. 1. Current Music Therapy Practices Flow Diagram

3   Content Analysis

In order to evaluate whether the designed activities meet the needs of dementia patient and their caregivers, semi-structured interviews were conducted with three music therapists and the results subjected to linguistic analysis.

3.1   Specialist Interviews

Answers to pre-set questions were collected from three therapists who had particular experience in employing music therapy with elderly dementia patients in a semi-structured interview. Researchers recorded the conversations in their entirety and later transcribed it for analysis.

(1) Interview Subjects
Three music therapists with clinical experience in the treatment of dementia patients were selected (see Table 1).

Table 1. Specialist Interview Summary

Music therapist	Specialty	Experience
Zhao-Wen Yang	music therapist for dementia elders	Chang Gung medical foundation
Siang-Ling You	music therapist for dementia elders	Cedar Falls Lutheran Home
Pei-Qi Wang	music therapist for dementia elders and children	Chang Gung medical foundation

(2) Interview Tool
The study utilized a semi-structured interview format for information collection. The questions referenced and inquired about aspects that the therapists considered important when evaluating a music therapy treatment style, and also about their

thoughts on directions and developments in technology-assisted music therapy. After obtaining consent from the interviewees, the conversations were recorded and later transcribed.

(3) Information Processing and Analysis

Utilizing vocabulary analysis[5] as part of content analysis, the conversation recordings were first transcribed. Referencing Chinese vocabulary ranges used in information processing previously published in *Academia Sinica*, the interviews were subjected to manual vocabulary truncation and the words categorized according to a Supplementary Resource from the Taiwan Department of Education: Chinese Language Commonly Used Vocabulary (Edition 3). For example, the phrase "can be considered for use in children" would be categorized as "can" (verb), "consider" (verb), "use" (verb), "for" (preposition), "children" (noun). However, as the conversation was colloquial, some vocabulary words unable to be categorized (e.g., English vocabulary, or phrases unable to be simplified) were processed according to the meanings of the constituent nouns, verbs, and adjectives. Those that appeared greater than five times throughout the interview were subjected to manual filtering by subject and highly relevant phrases in order to identify the keywords for subsequent categorization.

3.2   Interview Analysis and Outcome

The results of vocabulary analysis show a vocabulary density of 0.63, and the categorization of vocabulary from the three interviews are documented below as percentages according to the aforementioned Taiwan Department of Education Supplementary Resource (Table 2).

Table 2. Vocabulary Categorization Summary

	Grammar	**N**	**%**
Content word	nouns	311	18.7
	adjectives	93	5.6
	verbs	426	25.6
	adverb	82	4.9
	pronouns	92	5.5
	quantifier	27	1.6
Function word	preposition	203	12.2
	conjunction	174	10.5
	particle	7	0.4
	interjection	7	0.4
Punctuation	，	150	9.0
	、	19	1.1
	。	39	2.3
	；	2	0.1
Mathematical symbols	%	3	0.2
Number	number	12	0.7
Others	spoken language	14	0.8

There were 311 nouns, 93 adjectives, and 150 verbs. After manual filtering and confirmation of original meanings, 364 phrases with high relevance to the current research topic were sorted and categorized into 30 key phrases; the results are shown in Figure 2.

The words "elderly" (x32), "children" (x2), "family" (x10), "person" (x5), and "therapist" (x9) comprised 21.7% of the total words; they are categorized as system target user- and time frame-related vocabulary system target user-related vocabulary.

"Multimodality (x5), "different" (x8), "increase" (x5), "self-operate" (x13), and "guidance" (x6) comprised 12.91% of the total words; they are categorized as system multi-modality-related vocabulary.
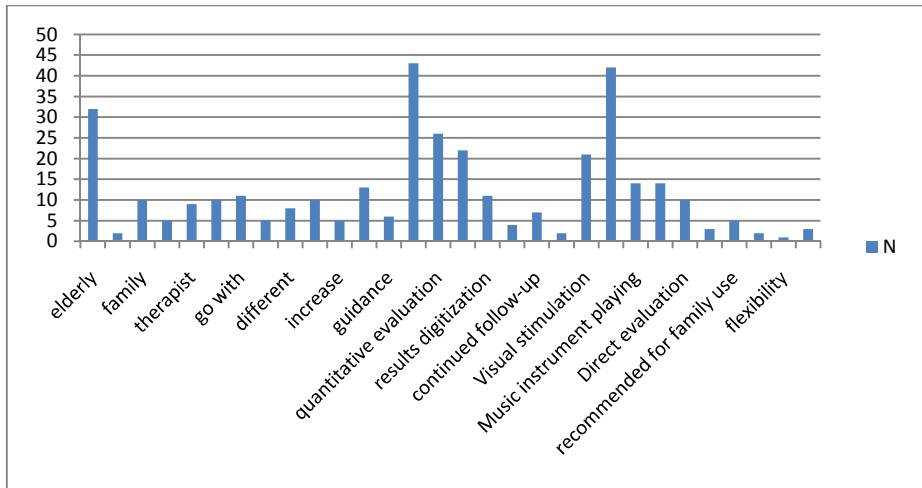

Fig. 2. Summary of vocabulary frequency analysis

"Visual stimulation" (x21), "auditory stimulation" (x42), and "tactile stimulation" (x1) comprised 17.58% of the total words; they are categorized as sensory stimulation-related vocabulary.

"Music instrument playing" (x14), "music tempo" (x14), "tone" (x4), and "understanding" (x3) comprised 9.62% of the total words; they are categorized as system activity suggestion-related vocabulary.

"Results evaluation" (x43), "quantitative evaluation" (x26), "qualitative evaluation" (x22), "results digitization" (x11), "results display" (x4), "continued follow-up" (x7), and "therapist-collected results" (x2) comprised 31.59% of the total words; they are categorized as system evaluation recommendation-related vocabulary.

"Direct evaluation" (x10), "easy to operate" (x3), "recommended for family use" (x5), "interesting" (x2), "flexibility" (x1), and "convenient" (x3) comprised 6.59% of the total words; they are categorized as system feedback-related vocabulary.

System evaluation recommendation-related vocabulary (31.59%) was the most frequently mentioned by therapists evaluating the program, followed by system target user and implementation (21.7%), sensory stimulation-related (17.58%), system

multi-modality-related (12.91%) , system activity suggestion-related (9.62%), and system feedback-related vocabularies (6.59%).

4   Discussion

Through vocabulary analysis, the content of the specialist interviews were collected into six categories for discussion: 1) System target user and implementation, 2) system multi-modality, 3) sensory stimulation, 4) system activity suggestions, 5) system evaluation recommendations, and 6) system feedback.

System target user and implementation: The research goal of the present study is clearly apparent here. "Therapists" design and recommend activity content for the "elderly" patients and their "family", who then jointly carry out the activities and thus increase interpersonal "interactions". The therapists recommended the present system be used "in conjunction" with existing music therapy activities, and not replace them. Consistent with our research goal, while carrying out music therapy activities, it is important to bear in mind that the interaction is not between the individual and a touch screen, but rather between individuals: in this way, we will not lose sight of the original purpose of music therapy.

System multi-modality: All therapists agreed that the system provides a novel activity medium for elderly dementia patients in the realm of music therapy. The software provides much in the way of song content, instrument types, and activity types, allowing users to freely choose their desired activities and increase their confidence in the process.

Sensory stimulation: The MTAS program increases visual and auditory stimulation for elderly dementia patients, and these stimulations allow for continued neural stimulation and association between the visual and auditory organs. For example, listening to a particular song can lead to visual imagery in the mind of the listener. However, the tablet format is unable to provide tactile stimulation, and therefore therapists suggested that the program be used in conjunction with original formats of music therapy to increase multi-modal sensory stimulation for elderly dementia patients.

System activity suggestions: The therapists suggested that the music tempo employed by MTAS may have been too fast, as dementia patients' hand-eye coordination is slower than that of the average population. Moreover, the therapists suggested deficiencies in the areas of "tone" and "music theory". For example, the elderly may sing along to a song, but the range of the default scale (C major) may extent too high for users to sing along with, and so should consider lowering the default key to G major. Second, often when users without prior understanding of keyboard instruments see a music note appear on top of a key, they tend to immediately press it without regard for the correct tempo, and thus produce music out of sync. Future design alterations may consider adding a guiding note that informs users to wait with respect to the correct tempo before hitting a key.

System evaluation recommendations: therapists gave positive feedback regarding the digitized results display, which permitted the rapid communication of music therapy progress to both users and family, and also has the added benefits of tracking

progress and monitoring long-term outcomes. However, the quantitative values provide only improvement trends or regressions; qualitative evaluations would still require further analysis and explanation from a therapist. Only when evaluations take into consideration both quantitative and qualitative assessments can a holistic picture of user progress through music therapy be generated.

System feedback: overall therapists gave positive feedback, indicating the system to be user-friendly and a convenient tool. Therapists stated they would recommend the software for use amongst elderly patients, and also suggested the tool as appropriate for children because of their high interest in new technology. Future development of MTAS might consider a music therapy system tailored to children.

While the present system used digitization to provide numerous benefits to the users, there remain areas that require further modification. For instance, the results evaluations require therapist input in addition to quantitative values if a meaningful overview is to be obtained. Main activities may need to adjust the default music tempo and scale in order to better meet the needs of elderly users. All these adjustments require music therapist input, and therefore the system should be viewed as a complementary tool to current music therapy practices, since it is somewhat lacking as an independent tool.

5 Conclusion and Recommendations for Future Study

In summary, the present study conducted a semi-structured interview with music therapy specialists and subjected the interview contents to vocabulary analysis. The results suggest that the novel MTAS system serves the functions envisioned in its initial research goals and is generally approved of by specialists. The program emphasized addressing the need for a multitude of choices in its design, which allowed for a greater degree of sensory stimulation via engaging and interesting activities. In addition, its quantitative results display permits easy visual comprehension of progress and long-term follow-up outcomes. Future music therapy systems will be tested by dementia patients and their families in order to further assess whether they meet the needs of real-world users.

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