

The application of a clown therapy intervention in hemodialysis: patient satisfaction and appropriateness

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ABSTRACT

Introduction: Hemodialysis patients often face challenges in their living conditions, including suffering, anxiety, depression, and reduced quality of life. Non-pharmacological interventions based on evidence can help improve the overall condition of these patients. Clown therapy is one such intervention that may enhance psychological well-being.

Methods: This study aimed to evaluate the satisfaction and appropriateness of clown therapy during hemodialysis sessions. Satisfaction and appropriateness were measured using a 5-point Likert scale. Nine clown therapists performed various techniques for 30 minutes daily over six days.

Results: The sample included 63 participants: 41 patients and 22 healthcare providers. Patients' satisfaction with clown therapy averaged 4.96 (SD = .126), and appropriateness during hemodialysis scored 4.98 (SD = .156). An association exists between appropriateness and satisfaction ($\chi^2 = 52.706$, $p = 0.000$). Healthcare providers' satisfaction averaged 4.68 (SD = .646), and appropriateness scored 4.64 (SD = .581). There is an association between satisfaction and appropriateness ($\chi^2 = 47.677$, $p = .000$). The relationship intensity between appropriateness and satisfaction is strong ($d = .793$, $p = .001$) with a high strength ($\tau-b = .794$, $p = .001$). No negative effects or disruptions to healthcare activities were observed during clown therapy. Observations indicated various psychological and social dynamics, including emotions, verbal communication, paralinguistics, kinesics, proxemics, and aptica.

Conclusions: Clown therapy during hemodialysis sessions seems suitable and satisfactory for patients and healthcare providers.

Keywords: Appropriateness, Clown Therapy, Complementary therapy, Hemodialysis, Patient satisfaction, Quality of care

Introduction

After being diagnosed with kidney failure, individuals face significant changes in their quality of life (1). They must undergo long-term hemodialysis, which negatively impacts cognitive and emotional states, behavior, social relationships, and mental health (2).

Habits, routines, work, hobbies, life plans, and relationships are profoundly impacted when a vital physiological function is maintained only through technology. Hospital-based hemodialysis becomes a restrictive yet essential requirement for survival (3).

During hemodialysis sessions, patients remain in bed, making the perception of time a notable psychological factor (4). Time tends to be perceived as passing more slowly,

and each session can be both mentally and physically demanding (5). This slower perception of time can lead to a sense of emptiness and a lack of engagement, as hemodialysis is primarily focused on biological survival (6). Patients in hospitals must adapt to technology-driven schedules, resulting in distress, reduced quality of life, anxiety, changes in self-image, and fears about the future and death (7).

In this context, contemporary care necessitates a holistic model that considers the multifaceted nature of the individual (8). This approach mandates attention not only to the physiological aspects of hemodialysis patients but also to their psychological, social, relational, and behavioral dimensions, which significantly influence treatment adherence (9).

Achieving patient-centered care requires evidence-based complementary interventions to improve well-being and quality of life (10). One such intervention, supported by scientific evidence, is clown therapy in dialysis care (11).

Clown therapy in hemodialysis

Clown therapy is categorized as a type of laughter therapy, and its effects on humans are explained by the

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neuropsychology of laughter and humor. According to Bennett et al. (12), the first review of laughter and humor interventions in hemodialysis found that these interventions may positively impact depression, anxiety, pain, immunity, fatigue, sleep quality, respiratory function, and blood glucose, suggesting potential applications for dialysis treatment.

Sun et al. (13) in an integrative review found that most patients believed humor therapy improved depression and anxiety, though some saw it as insignificant. A scoping review noted that no studies mentioned a theoretical basis, and laughter interventions were scheduled based on dialysis timings and lasted 30 minutes.

Certain quantitative design studies, such as randomized controlled trials or quasi-experimental studies, have examined the effects of music on patients undergoing hemodialysis (14). In a pragmatic randomized controlled trial by Bennet et al. (15), 151 patients from 10 HD centers in Northern California were studied. The intervention group received a weekly 30-minute laughter therapy session for 8 weeks. Results showed that depressive symptoms decreased from 17 (22%) to 16 (20%) in the control group, and from 11 (17%) to 5 (8%) in the intervention group ($p = 0.04$).

The randomized clinical trial study by Sahebkar et al. (16) investigated the effects of humor therapy on the fatigue levels of hemodialysis patients. The results indicated a significant decrease in fatigue in the humor therapy group, while the control group experienced an increase. In the quasi-experimental study conducted by Lee et al. (17), improvements were observed in stress and depression levels, as well as in emotional and functional well-being after participating in an 8-week laughter program that included a weekly 60-minute group session.

Neuropsychology of laughter and humor

Laughter therapy uses psychological theories like superiority, release, and dissonance to enhance life through both spontaneous and non-spontaneous laughter (18). There are two types of laughter therapy: humor therapy, using humorous videos and clowns, and laughter exercises without humor, involving clapping, dancing, vocalizing laughter-like sounds, breathing, and relaxation exercises (19).

Research indicates that laughter therapy has analgesic effects by releasing endorphins, which enhance pain tolerance. Additionally, laughter therapy influences the hypothalamus-pituitary-adrenal axis and sympathetic nervous system. It alleviates physical symptoms of stress by relaxing muscles, increasing circulation, and inhibiting the biological activity of "stress hormones" (20-22).

Objective

The study evaluated the feasibility of clown therapy during hemodialysis, focusing on intervention appropriateness and satisfaction among patients, healthcare professionals, and assistants.

Methods

The clown therapy intervention was carried out for six days between 10:00 and 10:30 at the Complex Structure of

Nephrology and Dialysis, Alghero Hospital, ASL n. 1 of Sassari, Sardegna, Italy. The setting for the clown therapy intervention was an open-space environment.

The variables measured were as follows:

- General process indicator, measured by the ratio of performed clown therapy interventions to scheduled interventions. The target was set at 100%.
- Process indicator "Level of Appropriateness" for patients, measured using a 5-point Likert scale weighted with numerical values from 1 to 5, with response types defined as: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The specific item measured was: "Express your level of agreement regarding the appropriateness of including clown therapy intervention in daily care." The established cut-off required that 90% of the scores had to be equal to or greater than 4.
- Process indicator "Level of Appropriateness" for healthcare professionals and healthcare assistants, measured using a 5-point Likert scale weighted with numerical values from 1 to 5, with response types defined as: strongly disagree (1), disagree (2), neutral (3), agree (4), and strongly agree (5). The specific item measured was: "Express your level of agreement regarding the appropriateness of including clown therapy intervention in daily care." The established cut-off required that 90% of the scores had to be equal to or greater than 4.
- Outcome indicator "Level of Satisfaction" for patients, measured using a 5-point Likert scale weighted with numerical values from 1 to 5, with response types defined as: very dissatisfied (1), dissatisfied (2), neutral (3), satisfied (4), and very satisfied (5). The specific item measured was: "Express an evaluation of your degree of satisfaction with the clown therapy intervention provided." The established cut-off required that 90% of the scores had to be equal to or greater than 4.
- Outcome indicator "Level of Satisfaction" for healthcare professionals and healthcare assistants, measured using a 5-point Likert scale weighted with numerical values from 1 to 5, with response types defined as: very dissatisfied (1), dissatisfied (2), neutral (3), satisfied (4), and very satisfied (5). The specific item measured was: "Express an evaluation of your degree of satisfaction with the clown therapy intervention provided." The established cut-off required that 90% of the scores had to be equal to or greater than 4.

In psychometrics, the Likert scale is a psychometric tool for measuring attitudes and opinions through a series of statements (items) to which the respondent responds by selecting a degree of agreement/disagreement from a ranked scale. The total score of the items summed provides a measure of the respondent's attitude toward a given topic, making it useful for investigating emotional states, preferences, and perceptions in various clinical contexts. Therefore, it allows for the quantification of opinions and perceptions on a specific topic, such as the effectiveness of a treatment or the impact of a condition. It is easy for participants to understand and complete, can be adapted to a wide range of topics and research applications, and transforms opinions into quantifiable data, allowing for statistical analysis.

The 5-point Likert scale offers responses from 1 = strongly disagree to 5 = strongly agree, with 3 neutral (23). This Likert scale is extensively utilized in research to assess attitudes, opinions, or perceptions (24). The Likert-type scale is widely used in research, providing a standardized method for quantifying subjective attitudes, opinions, and perceptions. The simple format makes it easy to administer and understand across various populations (25). The 5-point Likert scale is commonly used in dialysis to assess satisfaction and intervention suitability (26-29).

(f) Psychological and social dynamics with clown therapy between patients and clown therapists, with the factors of verbal and nonverbal communication, proxemics, haptics, kinesics, and paralinguistic system. Nonverbal communication is the exchange of messages and information through signals such as gestures, facial expressions, posture, eye contact, physical contact (haptics), tone of voice, and interpersonal distance (proxemics), without the use of words. These signals, which represent a significant part of human communication, can convey emotions, intentions, and meanings, often more powerfully or subtly than verbal language. Proxemics is the use of space and the distance one maintains with others, which reflects the nature of the relationship, from formal to intimate, and varies greatly by culture. Haptics is the study of physical contact, such as a handshake, a hug, or a pat on the back, that communicates closeness, affection, or support. Kinesics relates to body movements, such as posture and gestures, which can indicate mood, determination, or reflection. Paralinguistics refers to all the vocal elements that accompany speech but are independent of the literal meaning of the words. These include voice, intonation, tone, rhythm, volume, silence, and other sounds that modulate the verbal message, conveying emotional information, intentions, and the speaker's attitude, often unconsciously. In short, the paralinguistic describes the "how" of something, rather than the "what" of it."

Data for the indicators were collected immediately after the clown therapy intervention. It was done anonymously and in aggregate form, ensuring no individual could be identified. No sensitive data was collected. Statistical analyses also used anonymous and aggregated data.

The objective was to gather general information on the feasibility of incorporating structured clown therapy interventions into care practices, with an emphasis on patient satisfaction and the appropriateness of these interventions.

Intervention

The clown therapy intervention was performed by nine certified clown therapists, affiliated with the Associazione ViviamoInPositivo of Sassari, Italy. Each intervention lasted 30 minutes per day for six alternate days. The clown therapy approach was active, dynamic, and improvisational, with the use of various clown therapy and juggling techniques. Clown therapy interventions were always performed with two clown therapists.

The clown therapists received comprehensive training from the first author, which encompassed various aspects,

including: 1) the objective of the intervention; 2) the type of setting in which they would perform; 3) the type of patients with whom they would interact; 4) the duration of the clown therapy intervention; 5) behavioral guidelines for the healthcare environment; and 6) the use of personal protective equipment. During the hemodialysis sessions, the clown therapists approached each patient individually and inquired if they were interested in participating in the clown therapy.

Statistical Methods

For descriptive statistics, the analysis included frequency distribution, percentage distribution, mean, standard error of the mean, median, standard deviation, range, and the 95% confidence interval for the mean. To test for relationships between categorical variables, the chi-square χ^2 test was used. To examine correlations between quantitative variables, the Pearson correlation coefficient r was applied. Statistical significance was set at the 0.05 level (two-tailed). The analysis was conducted using IBM's Statistical Package for the Social Sciences (SPSS).

Results

The total number of subjects who responded to the indicators was 63, of which 41 were patients and 22 were healthcare professionals and healthcare assistants. In the patient group, 23 were male (56.1%) and 18 were female (43.9%), with a mean age of 65.3 years (SD = 12.4, 95% CI = 61.04-69.2). In the healthcare professionals and health care assistant group, five were male (22.7%) and 17 were female (77.3%), with a mean age of 52.13 years (SD = 5.4, 95% CI = 49.8 - 54.7). In terms of professional role, 21 were nurses, and 1 was a healthcare assistant.

The process indicator, measured by the ratio of performed to scheduled clown therapy interventions, reached 100%. All scheduled interventions were completed.

Both patients and professionals reported similarly high levels of appropriateness, as seen in Table 1.

TABLE 1 - Level of Appropriateness by Groups

Statistics	Patients n = 41	Healthcare Professionals and Healthcare Assistant n = 22
Mean	4.98	4.64
Standard Error	.024	.124
Standard Deviation	.156	.581
CI95%	4.93-5.02	4.38 - 4.89
Median	5.00	5.00
Minimum	4	3
Maximum	5	5
Range	1	2

Specifically for the process indicator "Level of appropriateness" for the item "Express your level of agreement regarding the appropriateness of including clown therapy intervention in daily care," patients show that 100% of the scores are equal to or greater than 4 (Satisfied), while for the healthcare professionals and health care assistant, the 97% of the scores are equal to or greater than 4 (Satisfied) as showed in table 2.

TABLE 2 - Distribution of scores by response type and by group, Item "Express your level of agreement with the appropriateness of including clown therapy intervention in daily care"

Response type	Patients n = 41	Healthcare Professionals and Health Care Assistant n = 22
Strongly Disagree	0 (0%)	0 (0%)
Disagree	0 (0%)	0 (0%)
Neutral	0 (0%)	1 (3%)
Agree	1 (2.5%)	6 (18.2%)
Strongly Agree	40 (97.5%)	15 (78.8%)

The results demonstrate that, for the vast majority of patients, healthcare professionals, and healthcare assistants, clown therapy interventions during dialysis sessions were perceived as appropriate. There is no association between gender and the level of appropriateness ($p = 0.499$). However, there is an association between the level of appropriateness and the level of satisfaction ($\chi^2 = 52.706$, $p = 0.000$), where high scores on the appropriateness scale were associated with high scores on the satisfaction scale.

Patients reported the highest satisfaction, while professionals had a very high average, as shown in Table 3.

TABLE 3 - Level of satisfaction by Group

Statistics	Patients n = 41	Healthcare Professionals and Healthcare Assistant n = 22
Mean	4.96	4,68
Standard Error	.01	.138
Standard Deviation	.126	.646
CI95%	4.78-5,00	4.40-4.97
Median	5.00	5.00
Minimum	4	3
Maximum	5	5
Range	1	2

Specifically for the process indicator "Level of Satisfaction" for the item "Express an evaluation of your level of satisfaction with the clown therapy intervention provided," patients show that 100% of the scores are equal to or greater than 4 (Satisfied), while for the healthcare professionals and health care assistant, the 91% of the scores are equal to or greater than 4 (Satisfied) as showed in table 4.

The findings indicate that most patients, healthcare professionals, and assistants found clown therapy during dialysis sessions highly satisfactory. There is no association between gender and the level of satisfaction ($p = 0.272$), and between professionals and the level of satisfaction ($p = .516$).

There is an association between the level of satisfaction and the level of appropriateness ($\chi^2 = 47.677$, $p = .000$), where high scores on the satisfaction scale were associated with high scores on the appropriateness scale. Directional measures show that the intensity of the relationship between appropriateness and satisfaction is strong ($d = .793$, $p = .001$), and the symmetry measures confirm the existence of a relationship between appropriateness and satisfaction, where the strength of the relationship between appropriateness and satisfaction is strong ($\tau\text{-}b = .794$, $p = .001$).

TABLE 4 - Distribution of scores by response type and by group, Item "Express an evaluation of your level of satisfaction with the clown therapy Intervention provided"

Response type	Patients n = 41	Healthcare Professionals and Healthcare Assistant n = 22
Very Dissatisfied	0 (0%)	1 (3 %)
Dissatisfied	0 (0%)	0 (0%)
Neutral	0 (0%)	2 (9, %)
Satisfied	1 (2.5%)	3 (13.6%)
Very Satisfied	40 (97.5%)	17 (77.4)

Patients reported no side effects from the clown therapy intervention, and healthcare professionals and assistants noted no issues impacting care activities due to the therapists' presence.

The psychological and social dynamics between patients and clown therapists were very interesting. Data was collected through observation and classified into primary and secondary emotions, verbal communication, paralinguistics, kinesics, proxemics, and tactile interactions. Throughout the interaction, the initial observable data is the gradual change in the distance between the clown and the patients, which decreased according to the patient's readiness to engage in the interaction.

Upon entering the dialysis area, clowns maintain an initial distance of approximately 3-4 meters from the patients (public area). Gradually, they move closer to the social area (1-2 meters), then the personal area (about 1 cm), and only occasionally into the intimate area (around 45 cm). This change in proxemics, leading to a more intense relationship, is facilitated by confirming elements from the kinesic system, such as increased eye contact, alterations in facial expressions, clapping, rhythmic body movements, smiles, and laughter.

The clowns clearly altered their paralinguistic system, varying tone, rhythm, frequency, and pauses. As the relationship progressed, the expressions of primary and secondary emotions, such as joy, surprise, cheerfulness, gratitude, and interest, became more and more evident. This dynamic included more verbal communication, primarily through singing and fluent conversations.

When the relationship between clown and patient had become more intense, the clowns could sometimes offer handshakes, a caress on an arm, a caress on the hand, and, at the end of the performance, a greeting. In Table 5, the psychological and social dynamics between patients and clown therapists are shown.

Discussion

To our knowledge, there are no existing studies that specifically evaluate the use of clown therapy in the hemodialysis field with respect to process indicators of appropriateness and outcome indicators of satisfaction. However, we can compare the findings of this study with those of others on clown therapy in hemodialysis. The appropriateness and satisfaction scores relate to the overall quality of life in hemodialysis, including pain, anxiety, depression, itching, cramps, fatigue, and sleep quality.

TABLE 5 - Psychological and social dynamics with clown therapy between patients and clown therapists

Primary and secondary emotions	Verbal communication	Paralinguistic system	Kinesic system	Proxemics	Aptica
Joy	Singing	Tone of voice	Eye contact	Intimate area (about 45 cm)	Handshake
Surprise	Fluent verbal communication	Voice frequency	Facial mimicry	Personal area (about 1 cm)	Greeting
Cheerfulness		Rhythm of the voice	Clapping	Social area (about 1-2 meters)	Caress on the hand
Gratitude		Silence	Posture Rhythmic body movements	Public area (about 3-4 meters)	Caress on an arm
Interest			Laughter Smile		

This study aligns with the review of Bennett et al, which found that clown therapy positively impacts depression, anxiety, pain, fatigue, and sleep quality in hemodialysis patients (12). Our results correspond with the integrative literature review by Sun et al. (13), which indicated that clown therapy had a positive impact on depression and anxiety.

Our study aligns with the scoping review of Xie et al., where the laughter intervention averaged 30 minutes. The results of our intervention align with those observed in the pragmatic randomized controlled trial conducted by Bennet et al. (15), where the group subjected to 30 minutes of laughter therapy demonstrated improvements in depressive symptoms.

The randomized clinical trial study of Sahebkar et al. showed similar findings, where the clown therapy improved the fatigue levels (16). Finally, the quasi-experimental study of Lee et al. (17) confirmed our results, where the clown therapy showed improvements in relation to stress and depression, as well as improvement in the emotional and functional well-being.

It is evident that the intervention had an impact at the psychological level on cognitive, emotional, and behavioral dimensions. Using observation without specific psychometric tests, which could be used in a future study, the data collected showed a considerable change in the routine of the patient and healthcare providers.

Smiling and laughing were undoubtedly the two dynamics of non-verbal communication that were always present in every intervention, both in patients and healthcare providers. Smiling and laughing have been indicators of a positive and collaborative relationship between human beings (30), and are correlated with happiness, personality, life satisfaction, cheerfulness, with an increased positive mood and decreased negative mood (31).

In addition to promoting a general sense of well-being, laughter relaxes the body, lowers stress hormones, boosts immune cells and antibodies that fight illness, releases endorphins, and keeps a positive, optimistic mindset through challenging circumstances, setbacks, and loss (32,33).

Limitations

Our clown therapy intervention has these main limitations. The duration of the intervention was 30 minutes only, spread over six days. Future interventions should provide

for a longer duration, for more days. This could enhance the effectiveness of clown therapy. The study focused on two indicators only: one process indicator (level of appropriateness) and one outcome indicator (level of satisfaction). Clinical outcomes in patients undergoing hemodialysis treatment were not evaluated. Investigating the effects of clown therapy on clinical outcomes would necessitate experimental clinical research with a randomized controlled study design.

Conclusions

Clown therapy during hemodialysis sessions showed generally positive effects. It was well-received by patients and healthcare providers, with no negative impacts on care activities. Clown therapy could be integrated into daily care routines.

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