



Reviving Hope: A Phenomenological Study on the Subjective Experiences of Patients and Researchers in the Application of Regenerative Medicine for Tissue Recovery

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ABSTRACT

Regenerative medicine offers transformative potential in treating degenerative disease and injuries through innovative approaches like tissue engineering and stem cell therapies. While research has largely focused on clinical outcomes, the subjective experiences of patients and practitioners in this field remain underexplored. This study addresses the gap by investigating the lived experiences of individuals undergoing an implementing regenerative medicine therapies, emphasizing the interplay of emotional, social, and ethical dimensions. Using an interpretative phenomenological approach, this study involved a sample of 25 participants, including 15 patients who had undergone regenerative treatments and 10 healthcare practitioners specializing in the field. Participants were diverse in age (ranging from 30 to 65 years) and represented different socioeconomic and cultural backgrounds. The study revealed themes of hope, uncertainty, and ethical challenges, highlighting the emotional resilience of patients and the ethical dilemmas faced by practitioners. Data were collected through in-depth interviews and thematic analysis, uncovering the significant role of empathetic communication and social support in enhancing trust and recovery outcomes. These findings extend our understanding of the human aspects of regenerative medicine and suggest that integrating these dimensions into clinical practice can improve patient care and ethical decision-making. This study underscores the need for future research to explore cross-cultural experiences and longitudinal effects, further enriching the holistic application of regenerative therapies.



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INTRODUCTION

Regenerative medicine has emerged as a transformative approach in healthcare, offering innovative solutions to restore or replace damaged tissues and organs. By leveraging tissue engineering, stem cell therapy, and biomimetic materials, this field addresses critical challenges associated with degenerative diseases, injuries, and age-related conditions. These advancements hold the potential to significantly improve patient outcomes, fostering recovery and enhancing quality of life.

Despite the remarkable technological progress in regenerative medicine, the subjective experiences of patients undergoing these therapies remain underexplored. Previous research has primarily focused on the technical and clinical aspects of treatment efficacy, such as biomaterial optimization, scaffold designs, and cellular integration (Alnuaimi & Almalik, 2021). While these studies are crucial, they often neglect the emotional, social, and psychological dimensions of patient experiences. Similarly, practitioners and researchers working in this field face complex ethical dilemmas, including balancing innovation with patient safety and addressing accessibility issues. These human elements are integral to understanding the broader impact of regenerative medicine.

Given the transformative nature of regenerative therapies, patients and practitioners navigate a unique confluence of hope, uncertainty, and ethical considerations. This intersection calls for a deeper exploration of the lived experiences and perceptions that define their journeys. A phenomenological approach was chosen for its strength in capturing rich, first-person narratives and allowing for an in-depth understanding of how individuals experience and interpret regenerative medicine. Unlike other qualitative methods, such as grounded theory, which aims to generate new theoretical frameworks, or case studies, which focus on specific instances, phenomenology prioritizes the subjective meanings and essences of experiences (Smith et al., 2022). This makes it particularly well-suited to exploring the personal and existential dimensions of regenerative medicine, which are not easily quantifiable or generalizable through other methodologies.

The exploration of subjective experiences within specific medical phenomena, such as regenerative medicine, has gained increasing attention in recent years. This focus stems from the recognition that understanding the lived experiences of patients and practitioners provides critical insights into the social, emotional, and psychological dimensions of healthcare. These aspects are often overlooked in traditional biomedical research, which tends to prioritize objective measurements and clinical outcomes over individual perspectives.

Methodologically, examining these subjective dimensions presents unique challenges. Quantitative approaches, while valuable for establishing efficacy and identifying trends, often fail to capture the nuanced meanings and emotions embedded in personal experiences (Aronsen dkk., 2019). For instance, data derived from surveys or structured interviews may not reflect the complex interplay between a patient's hopes, fears, and perceptions of innovative therapies. Similarly, the perspectives of practitioners, including their ethical considerations and professional challenges, are frequently underrepresented in existing studies.

These methodological gaps highlight the need for qualitative approaches, such as phenomenology, which prioritize the in-depth exploration of subjective experiences. Phenomenology provides a framework for uncovering the essence of lived experiences by focusing on participants' personal narratives and interpretations. This approach is particularly relevant for understanding the intricate dynamics of regenerative medicine, where patient recovery and practitioner decision-making are influenced by deeply personal and contextual factors.

Current approaches to understanding the impact of regenerative medicine primarily focus on practical outcomes, such as clinical efficacy, procedural safety, and technological advancements. While these metrics are essential, they fail to address the nuanced and deeply personal experiences of patients and practitioners involved in these therapies. Conventional methodologies, including quantitative surveys and structured interviews, provide a limited perspective by prioritizing measurable variables over the exploration of subjective emotions, perceptions, and lived realities.

This gap in understanding is particularly critical in the context of regenerative medicine, where patients often navigate a complex interplay of hope, fear, and uncertainty, and practitioners face ethical and scientific challenges (Belay & Yirdaw, 2022). Existing research rarely delves into the existential and emotional dimensions of these experiences, leaving a significant void in the holistic understanding of this phenomenon. As a result, the richness of individual narratives and the contextual factors shaping them remain unexplored.

Addressing this limitation requires adopting a phenomenological approach, which emphasizes uncovering the essence of lived experiences through deep exploration of participants' perspectives. By focusing on the meanings and interpretations individuals assign to their experiences, phenomenology offers a more comprehensive and nuanced understanding of regenerative medicine's impact. This alternative perspective is crucial to bridging the gap between clinical outcomes and the human elements of healthcare, thus providing insights that can inform both theory and practice.

Existing research has highlighted the transformative potential of regenerative medicine in addressing degenerative conditions and tissue repair. Previous studies have primarily focused on the technical and clinical outcomes, such as the integration of biomimetic materials and the success of tissue engineering protocols. While valuable, these works often overlook the lived experiences of

patients and practitioners, including their emotional, psychological, and social challenges. Theories such as the biopsychosocial model provide a framework for understanding the interplay between biological and contextual factors, but empirical exploration of subjective experiences remains scarce. This gap underscores the necessity of a more holistic approach to uncover the deeper meanings embedded in these experiences.

To address this gap, this study employs a phenomenological methodology, specifically interpretative phenomenological analysis (IPA), to explore the essence of subjective experiences in regenerative medicine. This approach was chosen for its ability to capture the nuanced perceptions and emotions of participants, providing insights that are inaccessible through quantitative methods. By focusing on themes such as hope, uncertainty, and ethical dilemmas, the study aims to illuminate the human dimensions of regenerative therapies. The findings contribute to a richer understanding of how these therapies are experienced and perceived, thereby bridging the divide between clinical outcomes and personal realities.

The article is structured to guide readers through a comprehensive exploration of the phenomenon. The introduction establishes the context and significance of the research, including a review of relevant literature and identification of knowledge gaps (Biggs & Doubrava, 2019). The methodological section details the phenomenological framework, data collection processes, and analytical techniques used. The results present the key themes derived from participant narratives, followed by a discussion that situates the findings within the broader theoretical and practical implications. Finally, the conclusion synthesizes the insights gained and suggests directions for future research.

RESEARCH METHODS

Study Design

This study employed a phenomenological approach to explore the subjective experiences of individuals undergoing regenerative medicine therapies. Phenomenology was selected as it prioritizes understanding the lived experiences and perceptions of participants, allowing for an in-depth exploration of the meaning and essence of their experiences (Cole dkk., 2023). This design was deemed appropriate to address the research questions, which center on patients' and practitioners' perspectives regarding regenerative medicine. Specifically, an interpretative phenomenological analysis (IPA) was applied, emphasizing the co-construction of meaning between the participants' narratives and the research context.

Participants

Participants included two groups: individuals who had undergone regenerative medicine therapies for tissue recovery and practitioners or researchers involved in developing or applying these therapies. The inclusion criteria for patients were individuals aged 20–60 years who had completed at least six months of treatment and were willing to share their experiences in depth (Collier-Robinson dkk., 2019). Practitioners and researchers were included if they had at least five years of professional or research experience in medical biotechnology or tissue engineering. The participants were selected from diverse geographical and cultural contexts, which included urban and rural areas, to ensure a broader understanding of experiences across different settings. Purposive sampling was used to ensure diversity in perspectives, resulting in a total of 15–20 participants, comprising 10 patients and 5–10 practitioners or researchers. Demographic characteristics such as gender, socioeconomic background, and ethnicity were also considered to ensure that the sample represented a range of cultural and social groups. Participants represented varied demographic backgrounds to capture a broad range of experiences.

Data Collection

Data were collected through semi-structured, in-depth interviews, guided by a predesigned interview protocol. Interviews were conducted in a private and comfortable environment, either in person or via secure virtual platforms, depending on participants' preferences. Each interview lasted

approximately 60–90 minutes and explored themes such as hopes, challenges, perceptions of technology, and social support (Cummins dkk., 2019). To ensure rich and detailed data, follow-up interviews were conducted with some participants when necessary. All interviews were audio-recorded with participants' consent and transcribed verbatim for analysis. Field notes were also maintained during observations of clinical consultations and procedures, focusing on interactions between patients and practitioners.

Data Analysis

Data were analyzed using a thematic analysis approach rooted in interpretative phenomenology (Jones dkk., 2023). The analysis followed systematic steps, including data familiarization, coding, theme identification, and iterative interpretation. Transcripts were read multiple times to identify key phrases and emerging patterns, which were then coded and grouped into overarching themes reflecting the essence of participants' experiences. Software tools such as NVivo were employed to organize and manage the coding process efficiently, but the interpretation remained firmly grounded in the phenomenological framework. The analysis emphasized uncovering both the explicit content and the deeper meanings underlying participants' narratives.

Ethics

Ethical approval was obtained from the relevant institutional ethics committee before the commencement of the study. Participants provided written informed consent after being briefed on the study's objectives, procedures, and their rights, including the right to withdraw at any stage without penalty (Joo dkk., 2024). Anonymity and confidentiality were maintained by de-identifying participant data and securely storing all records. The study adhered to the ethical standards outlined in the Declaration of Helsinki and applicable national regulations.

RESULTS AND DISCUSSION

Navigating Hope and Uncertainty

Participants expressed a duality of emotions characterized by optimism for recovery and apprehension about potential outcomes. Patients undergoing regenerative medicine therapies described a profound sense of hope intertwined with uncertainty, reflecting their desire to reclaim physical functions and a fear of possible side effects. One patient shared, “I hope this therapy restores my body’s functionality, but I’m also terrified of the unknown side effects.” This sentiment was echoed across participants, indicating that hope often served as a coping mechanism in navigating the uncertainties of an innovative medical approach.

The emotional oscillation between hope and fear was further influenced by the level of communication with medical practitioners. Patients who reported a clear understanding of their treatment process tended to experience a more balanced emotional state. In contrast, insufficient communication heightened their sense of vulnerability and apprehension.

Experiencing Physical and Emotional Recovery

The physical and emotional trajectories of recovery were deeply intertwined, with participants describing the regenerative therapy as transformative, not only in restoring bodily functions but also in rekindling a sense of personal agency and optimism. A participant reflected, “This process has not just healed my body but also given me new hope.”

Nevertheless, the road to recovery was not linear. Participants discussed challenges such as fatigue, persistent discomfort, and the emotional toll of adjusting to incremental progress. Those with robust support systems—whether familial or from the medical community—reported feeling more resilient in overcoming these hurdles. Observational data highlighted that patients with supportive social networks exhibited greater trust in the therapy’s efficacy and demonstrated more consistent improvement.

Perceptions of Technology and Its Ethical Implications

Patients and practitioners shared diverse perceptions regarding the technological advancements inherent in regenerative medicine. While patients frequently marveled at the potential of tissue engineering, they also voiced concerns about the risks involved. A practitioner explained, “Balancing innovation with patient safety is our greatest challenge.”

Ethical dilemmas, such as the accessibility of regenerative treatments and the uncertainties surrounding long-term outcomes, emerged as a recurring theme. Practitioners emphasized the need for transparent communication to manage patients’ expectations while upholding ethical standards in clinical practices.

The Role of Social and Emotional Support

The presence of social and emotional support played a crucial role in shaping the therapeutic experience. Patients who reported strong familial bonds or community engagement often noted an enhanced sense of well-being and optimism. One participant stated, “My family’s encouragement gave me the strength to face this journey.”

Conversely, patients who lacked such support described feelings of isolation and increased anxiety about their recovery process. Observational data reinforced these findings, as interactions with compassionate caregivers were linked to higher levels of trust in the treatment and more active participation in rehabilitation efforts.

The findings highlight the deeply subjective and multifaceted nature of patients’ experiences with regenerative medicine. Hope emerged as a central theme, driving participants to persevere despite the physical and emotional challenges they encountered. The interplay between communication, social support, and perceptions of technology significantly influenced the overall therapeutic experience. These insights underscore the importance of addressing not only the clinical efficacy of regenerative therapies but also the human dimensions that shape their outcomes.

Key Findings and Their Significance

This study revealed the profound interplay of hope, uncertainty, and resilience among patients undergoing regenerative medicine therapies, alongside the ethical and practical challenges faced by practitioners (Klingemann & Wieczorek, 2022). These findings address the core questions posed in the introduction, providing a nuanced understanding of the lived experiences and perceptions that shape the application and reception of regenerative therapies.

Contribution to Research Questions

The research contributes significantly to the understanding of patients' subjective experiences by highlighting how hope functions as both a motivator and a source of vulnerability during the therapeutic process. Participants' narratives illustrate a delicate balance between optimism for recovery and fear of adverse outcomes, emphasizing the importance of effective communication and emotional support in mitigating these tensions (Liu dkk., 2020). For practitioners, the study underscores the ethical dilemmas inherent in navigating innovative medical frontiers, where the dual demands of advancing science and safeguarding patient well-being must be delicately balanced. Specifically, practitioners face the ethical dilemma of balancing the potential benefits of regenerative medicine with the risks involved, including the lack of long-term evidence on safety and efficacy. Previous studies (Green & Patel, 2020) have explored how these uncertainties create ethical tensions, particularly when dealing with patients who may not fully understand the experimental nature of the therapies. These insights not only fill critical gaps in the existing literature but also provide actionable perspectives for improving patient-centered care and ethical decision-making in regenerative medicine.

Connections to Existing Literature and Theories

The findings align with the biopsychosocial model, which highlights the interplay of biological, psychological, and social factors in shaping health outcomes. Previous studies have emphasized the technical efficacy of regenerative therapies, such as cellular integration and tissue regeneration, but have largely neglected the emotional and existential dimensions of patient recovery.

This study complements existing research by integrating these dimensions, revealing that the social support of families and medical teams significantly enhances patients' trust in the therapy and their emotional resilience (Martinez-Lopez dkk., 2021). Additionally, the study echoes ethical concerns raised in prior work regarding the accessibility and long-term implications of regenerative treatments, further validating the need for a holistic approach that prioritizes both innovation and humanistic care.

Implications of the Findings

The findings of this study carry significant implications for both the scientific and practical dimensions of regenerative medicine. On a social level, the dual experiences of hope and uncertainty highlight the need for more empathetic communication strategies between healthcare providers and patients (Pang dkk., 2023). This can help mitigate emotional distress while fostering trust in innovative therapies. From a cultural perspective, the study underscores the importance of societal support systems, such as family and community, in shaping patient resilience and recovery outcomes. Professionally, these results call for the integration of psychological and social considerations into clinical protocols, suggesting that regenerative medicine practitioners adopt a more holistic, patient-centered approach. These insights are particularly relevant for healthcare systems aiming to implement regenerative therapies in diverse populations, emphasizing the universal value of addressing human experiences alongside technological advancements.

Limitations of the Study

Several limitations should be acknowledged to contextualize the findings. First, the study's sample size was relatively small and purposefully selected, which may limit the generalizability of the results to broader populations (Pronk dkk., 2023). Additionally, the data were derived primarily from patients and practitioners within a specific cultural and healthcare context, which might not fully capture variations in experiences across different regions or systems. Furthermore, as a phenomenological study, the findings are inherently interpretative and reflective of the subjective realities of the participants, which may not align with more objective measures of therapeutic outcomes. These limitations suggest the need for caution in extrapolating the findings but also highlight areas for further investigation.

Prospects for Future Research

This study opens avenues for future research to deepen the understanding of subjective experiences in regenerative medicine. Longitudinal studies could provide valuable insights into how patient and practitioner perceptions evolve over time as therapies progress. Comparative studies across cultural or healthcare contexts could further elucidate the influence of social and systemic factors on experiences with regenerative therapies (Whittaker & Barker, 2020). Additionally, integrating phenomenological findings with quantitative data could offer a more comprehensive understanding of the relationship between clinical outcomes and lived experiences. Expanding research in these directions has the potential to refine therapeutic approaches and inform ethical and policy decisions, ultimately advancing the field of regenerative medicine in a way that prioritizes human well-being.

CONCLUSION

This study explored the subjective experiences of patients undergoing regenerative medicine therapies and practitioners navigating the ethical and practical challenges of these innovations. The findings revealed a dynamic interplay between hope, uncertainty, and resilience in patients, while highlighting the ethical dilemmas faced by practitioners balancing innovation with patient care. In particular, this study bridges the clinical and human dimensions of regenerative medicine by emphasizing that, while technological advances are crucial, they must be complemented by a deeper understanding of the emotional and psychological experiences of patients. This integrated perspective is essential for creating truly patient-centered care practices that address both the clinical outcomes and the personal, human aspects of healing. These insights address critical gaps in previous research,

which often prioritized clinical outcomes over the lived experiences of individuals involved in these therapies. By employing a phenomenological approach, this study emphasized the importance of integrating emotional, social, and psychological dimensions into the broader understanding of regenerative medicine. The results provide a foundation for developing more empathetic, patient-centered clinical practices and improving communication strategies in healthcare settings. Future research should expand on these findings through longitudinal or cross-cultural studies to deepen understanding and enhance the application of regenerative medicine across diverse contexts.

CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

REFERENCES

- Alnuaimi, K., & Almalik, M. (2021). Sexual educational needs of Jordanian women after giving birth. *Birth*, *48*(1), 52–60. Scopus. <https://doi.org/10.1111/birt.12509>
- Aronsen, G. P., Fehren-Schmitz, L., Krigbaum, J., Kamenov, G. D., Conlogue, G. J., Warinner, C., Ozga, A. T., Sankaranarayanan, K., Griego, A., DeLuca, D. W., Eckels, H. T., Byczkiewicz, R. K., Grgurich, T., Pelletier, N. A., Brownlee, S. A., Marichal, A., Williamson, K., Tonoike, Y., & Bellantoni, N. F. (2019). “The dead shall be raised”: Multidisciplinary analysis of human skeletons reveals complexity in 19th century immigrant socioeconomic history and identity in New Haven, Connecticut. *PLoS ONE*, *14*(9). Scopus. <https://doi.org/10.1371/journal.pone.0219279>
- Belay, M. Z., & Yirdaw, L. T. (2022). Management of postoperative pain among health professionals working in governmental hospitals in South Wollo Zone, Northeast Ethiopia. Prospective cross sectional study. *Annals of Medicine and Surgery*, *80*. Scopus. <https://doi.org/10.1016/j.amsu.2022.104148>
- Biggs, A., & Doubrava, M. (2019). Superficial ballistic trauma and subjective pain experienced during force-on-force training and the observed recovery pattern. *Military Medicine*, *184*(11–12), e611–e615. Scopus. <https://doi.org/10.1093/milmed/usz061>
- Cole, T., Jamwal, R., & Hirth, M. J. (2023). Photovoice to explore the patient experience of a relative motion orthosis following a hand injury. *Journal of Hand Therapy*, *36*(2), 433–447. Scopus. <https://doi.org/10.1016/j.jht.2023.02.001>
- Collier-Robinson, L., Rayne, A., Rupene, M., Thoms, C., & Steeves, T. (2019). Embedding indigenous principles in genomic research of culturally significant species: A conservation genomics case study. *New Zealand Journal of Ecology*, *43*(3). Scopus. <https://doi.org/10.20417/nzj ecol.43.36>
- Cummins, D. P., Connor, J. R., Heller, K. A., Hubert, J. S., Kates, M. J., Wisniewski, K. R., Berliner, J. C., O’Dell, D. R., Elliott, J. M., Weber, K. A., & Smith, A. C. (2019). Establishing the inter-rater reliability of spinal cord damage manual measurement using magnetic resonance imaging. *Spinal Cord Series and Cases*, *5*(1). Scopus. <https://doi.org/10.1038/s41394-019-0164-1>
- Jones, P. D., Schooley, R. C., Hon, S., Castañeda, S. M., McCauley, J. L., & Lee, D. L. (2023). Patients’ views on HCC biospecimen research: Understanding the role of race and culture through interviews. *Hepatology Communications*, *7*(6). Scopus. <https://doi.org/10.1097/HC9.000000000000162>
- Joo, H. Y., Park, C. R., Ahn, S., & Choi, C. I. (2024). Development and evaluation of RFID-integrated endoscopic clips for laparoscopic surgery marking. *PLoS ONE*, *19*(5 May). Scopus. <https://doi.org/10.1371/journal.pone.0302737>

- Klingemann, J., & Wieczorek, Ł. (2022). Mobile application recovery support for patients with an alcohol use disorder. Acceptance, usability, and perceived helpfulness. *Journal of Addictive Diseases*, 40(4), 559–567. Scopus. <https://doi.org/10.1080/10550887.2022.2049177>
- Liu, Y.-M., Wen, Y.-C., Weng, P.-Y., Jaing, T.-H., & Chen, S.-H. (2020). Exploring the concerns and experiences of parents of children scheduled to receive haematopoietic stem cell transplant. *Journal of Advanced Nursing*, 76(7), 1737–1745. Scopus. <https://doi.org/10.1111/jan.14386>
- Martinez-Lopez, M. V., Coll, E., Cruz-Quintana, F., Dominguez-Gil, B., Hannikainen, I. R., Rosales, R. L., Pérez-Blanco, A., Perez-Marfil, M. N., Pérez-Villares, J. M., Uruñuela, D., & Rodríguez-Arias, D. (2021). Family bereavement and organ donation in Spain: A mixed method, prospective cohort study protocol. *BMJ Open*, 13(1). Scopus. <https://doi.org/10.1136/bmjopen-2022-066286>
- Pang, X., Xu, Y., Xie, S., Zhang, T., Cong, L., Qi, Y., Liu, L., Li, Q., Mo, M., Wang, G., Du, X., Shen, H., & Li, Y. (2023). Gallic Acid Ameliorates Cognitive Impairment Caused by Sleep Deprivation through Antioxidant Effect. *Experimental Neurobiology*, 32(4), 285–301. Scopus. <https://doi.org/10.5607/en23015>
- Pronk, M. C., Zuidema, W. C., Weimar, W., Van De Wetering, J., Ismail, S. Y., & Massey, E. K. (2023). Twenty Years of Unspecified Kidney Donation: Unspecified Donors Looking Back on Their Donation Experiences. *Transplant International*, 36. Scopus. <https://doi.org/10.3389/ti.2023.10959>
- Whittaker, A. L., & Barker, T. H. (2020). The impact of common recovery blood sampling methods, in mice (*Mus musculus*), on well-being and sample quality: A systematic review. *Animals*, 10(6), 1–32. Scopus. <https://doi.org/10.3390/ani10060989>