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ICF-guided home-based physiotherapy interventions – assessing their impact on quality of life in palliative care for patients with rheumatoid arthritis: a pilot study

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Abstract

Introduction. The current study assessed the impact of the International Classification of Functioning, Disability and Health (ICF)-guided home-based physiotherapy programs on improving quality of life in patients with rheumatoid arthritis (RA) receiving palliative care.

Methods. The study used a two-arm parallel group pretest-posttest experimental group design. A total of 50 RA patients receiving palliative home care were recruited based on the eligibility criteria and randomly allocated to an intervention group ($n = 25$) that received ICF-guided physiotherapy with standard care or a control group ($n = 25$) that received only standard care. The study used the Short Form Health Survey (SF-36) to assess quality of life, the Health Assessment Questionnaire (HAQ) to measure physical function, the Visual Analogue Scale (VAS) to determine pain levels, and the Hospital Anxiety and Depression Scale (HADS) to evaluate psychological health. Data was collected at the start of the study and after a 12-week intervention period.

Results. The intervention group had significant improvements for all outcome scores, including SF-36 ($p < 0.001$), HAQ ($p < 0.001$), and VAS ($p < 0.001$) when compared to the control group.

Conclusions. The findings emphasise the considerable potential of ICF-guided home-based physiotherapy interventions in enhancing the quality of life, physical functionality, pain management, and psychological health of RA patients receiving palliative care. Implementing such interventions as part of the palliative care protocol for RA patients could greatly improve patient outcomes. However, additional long-term studies are advised to confirm these benefits and refine the intervention strategies.

Key words: palliative care, quality of life, physiotherapy, ICF, pain management, physical functioning, psychological well-bein

Introduction

Rheumatoid arthritis (RA) is a chronic autoimmune disease marked by persistent inflammation that mainly impacts the synovial joints [1]. RA also impacts various organ systems, leading to a range of debilitating symptoms and comorbidities [2], such as pain, fatigue, reduced physical function, and psychosocial distress, that contribute to a substantial decrease in quality of life (QoL) [3]. As the disease advances and these effects intensify, many patients require palliative care – a specialised multidisciplinary approach that focuses on providing relief from the symptoms and stress of serious illnesses [4].

Despite significant strides in the pharmacological management of RA, including the advent and progression of disease-modifying and rheumatic drugs (DMARDs), a considerable proportion of patients with advanced RA continue to suffer from significant disease burden [5]. This enduring disease burden underscores the need for additional supportive and palliative interventions to improve the QoL in this population [6].

Physiotherapy plays a fundamental role in the comprehensive management of RA. By focusing on improving physical function and mobility, reducing pain, and enhancing overall well-being, physiotherapy interventions can significantly contribute to QoL [7]. The International Classification of Functioning, Disability and Health (ICF) offer a comprehensive biopsychosocial framework for planning and implementing interventions [8]. Furthermore, the ICF emphasises the intricate interaction between a person's health condition, personal factors, and environmental influences, thereby endorsing a more holistic approach to patient care [9].

There remains a dearth of evidence on the effectiveness of ICF-guided physiotherapy interventions for RA patients in palliative care settings. This lack of research creates a critical knowledge gap in our understanding of how to best support and care for individuals with advanced RA [10].

The importance of addressing QoL in RA sufferers is further emphasised by the disease's potential to impose a considerable socioeconomic burden on patients, their families, and healthcare systems [11]. This burden is primarily attributable to increased healthcare costs, reduced work productivity, and decreased overall life satisfaction [12]. Consequently, interventions that effectively alleviate symptoms and improve patient well-being could have a profound impact on the broader societal and economic implications of RA [13].

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While conventional pharmacological approaches remain essential for managing RA, there is growing recognition of the need for non-pharmacological interventions, such as physiotherapy, to enhance the comprehensive care of RA patients [14]. Physiotherapy techniques encompass a wide range of modalities, including exercise therapy, joint mobilisation, soft tissue techniques, and patient education [15]. These modalities can be tailored to address individual needs and preferences, thereby maximising the likelihood of positive outcomes [16].

The ICF provides a valuable structure for the systematic planning and implementation of physiotherapy interventions in RA patients. Its biopsychosocial framework allows practitioners to consider the complex interplay between physical, psychological, and social factors in shaping patients' health outcomes [17]. By incorporating this framework into their practice, physiotherapists can design more targeted, patient-centred interventions that address the specific needs and priorities of individuals with RA [18].

Recent studies have begun to explore the application of the ICF to guide the management of various chronic health conditions, including RA [19]. However, most research has focused on using the ICF in the early stages of the disease or for rehabilitation [20]. Nonetheless, the potential of ICF-guided physiotherapy interventions to enhance QoL in palliative care settings for RA patients remains largely unexplored. This knowledge gap hinders the optimal management of patients with advanced RA and limits our understanding of the full potential of the ICF model in addressing complex health conditions.

In response to this need, our study aimed to provide a comprehensive assessment of the impact of ICF-guided physiotherapy interventions on various aspects of QoL for RA patients in palliative care. Specifically, we investigated the effects of these interventions on physical functioning, pain levels, psychological well-being, and overall QoL. By doing so, we hope to shed light on the potential benefits of incorporating the ICF framework into physiotherapy practice for patients with advanced RA, thereby informing future research and clinical practice in this critical area of healthcare.

Subjects and methods

Study design

This two-arm parallel group randomised controlled study was executed within the Department of Physiotherapy of the Integral Institute of Medical Science and Research at the Integral University in Lucknow, Uttar Pradesh, India. The study design facilitated the exploration of the impact of home-based physiotherapy interventions, guided by the ICF, on the QoL of RA patients in palliative care [21]. The sample size was calculated using G*Power 3.15 software developed by Franz F at Universität Kiel, Germany. To ensure a minimum acceptable intraclass correlation coefficient (ICC) of 0.60 and a reliability of 0.75 at a 95 % confidence level, a minimum of 50 subjects were needed.

Subjects

Participants included 50 RA patients receiving palliative care at home under the advice of a primary care centre during the study period. All patients (> 18 years) diagnosed with RA and in the palliative care stage who were able to give informed consent were included. Patients were excluded if they had other severe comorbidities that could interfere with the physiotherapy intervention. Patients were randomly allocated into an intervention group (n = 25) and a control group (n = 25) using a random number generator [22].

The intervention group undertook a 12-week programme of ICF-guided physiotherapy tailored to individual patient needs, along with standard care that included pharmacological management. The ICF model was used to assess each patient's functioning in various domains, such as body functions and structures, activities, participation, and environmental factors. Based on this assessment, personalised physiotherapy programmes were developed [23]. The control group received standard care, which included pharmacological management and general advice on mobility and pain management.

Outcome measures

Outcome measures were assessed through self-reported questionnaires at baseline and post-intervention, which lasted for 12 weeks. The Short Form Health Survey (SF-36), a validated tool for assessing health-related QoL [24, 25], was used to evaluate QoL. The Health Assessment Questionnaire (HAQ) assesses physical functioning in patients with RA, as it is a commonly used tool for this purpose [26]. The Visual Analogue Scale (VAS) was used to assess pain levels, which is a reliable and simple tool for measuring pain intensity [27]. Psychological well-being was assessed using the Hospital Anxiety and Depression Scale (HADS), a validated tool for evaluating mental health status [28, 29].

Statistical analysis

Data were analysed using SPSS software. Descriptive statistics summarised the data, while inferential statistics, including the independent t-test and chi-squared test, were used to compare the two groups. A p-value of less than 0.05 was considered statistically significant.

Results

The age distribution across the intervention and control groups was reasonably consistent, with both having participants of similar ages, as seen in Table 1. The higher prevalence of RA in females was reflected in the sex distribution of our sample. The body mass index (BMI) and disease duration were also comparable between the two groups, reinforcing the parity in the baseline characteristics of the participants. Any significant findings and outcomes from the study can, therefore, be assumed to arise from the interventions and not from inherent differences between the groups.

Table 2 represents the pre and post-intervention scores for the intervention group across various outcome measures. From the data, we observed a notable increase in the SF-36 scores after the intervention, indicating improved overall QoL

Table 1. Descriptive statistics for subject characteristics.

Characteristic	Intervention group (n = 25)	Control group (n = 25)	Total (n = 50)
Age (years, mean ± *SD*)	65.2 ± 8.1	64.9 ± 8.4	65.1 ± 8.2
Sex (M/F, *n*)	08/17	07/18	15/35
BMI (mean ± *SD*)	27.3 ± 3.5	27.5 ± 3.7	27.4 ± 3.6
Disease duration (years, mean ± *SD*)	6.2 ± 2.1	6.5 ± 2.3	6.3 ± 2.2

BMI – body mass index, M – male, F – female

Table 2. Pre and post-intervention scores for the intervention group

Outcome measure	Pre-intervention (mean ± *SD*)	Post-intervention (mean ± *SD*)	*p*-value
SF-36	30.5 ± 8.2	45.2 ± 7.6	< 0.001
HAQ	2.1 ± 0.6	1.3 ± 0.5	< 0.001
VAS	7.3 ± 1.8	4.2 ± 1.7	< 0.01
HADS	13.2 ± 3.6	9.1 ± 3.1	< 0.05

HADS – Hospital Anxiety and Depression Scale, HAQ – Health Assessment Questionnaire, SF-36 - Short Form Health Survey, VAS – Visual Analogue Scale

Table 3. Pre and post-intervention scores for the control group

Outcome measure	Pre-intervention (mean ± *SD*)	Post-intervention (mean ± *SD*)	*p*-value
SF-36	31.3 ± 7.9	33.1 ± 8.1	< 0.001
HAQ	2.0 ± 0.7	1.9 ± 0.6	< 0.001
VAS	7.2 ± 1.9	6.8 ± 1.8	< 0.01
HADS	13.0 ± 3.7	12.6 ± 3.4	< 0.05

HADS – Hospital Anxiety and Depression Scale, HAQ – Health Assessment Questionnaire, SF-36 – Short Form Health Survey, VAS – Visual Analogue Scale

for RA patients. Additionally, the HAQ post-intervention scores, which assess physical functioning, revealed enhanced physical capabilities among participants, emphasising the benefits of the intervention in managing physical limitations associated with RA. The VAS scores showed a significant reduction, highlighting the effectiveness of ICF-guided physiotherapy in pain alleviation for these patients. Furthermore, the decline in HADS scores post-intervention points to an improvement in the psychological well-being of the participants, suggesting that the intervention successfully addressed both the physical and psychological aspects of RA. The statistically significant *p*-values attached to each outcome further emphasise the importance of these positive outcomes.

Table 3 represents the pre and post-intervention scores for the control group. Post-intervention, there was a marginal increase in the SF-36 scores, suggesting improved QoL. The HAQ scores also indicated a subtle improvement in physical function. Meanwhile, the VAS scores recorded a modest reduction in pain perception, and the HADS scores denoted a minor decline, pointing towards improved psychological well-being for participants.

Discussion

Driven by a need to understand the role of ICF-guided physiotherapy interventions in the palliative care of patients with advanced RA, this study assessed the effects of these interventions on QoL factors, including physical functioning, pain levels, psychological well-being, and overall QoL. We employed numerous measurement tools to evaluate these variables, including the SF-36 (QoL), HAQ (physical function), VAS (pain levels), and HADS (psychological well-being). The study findings underscore the potential benefits of ICF-guided physiotherapy interventions. Indeed, the intervention group experienced significant improvements in QoL, physical functioning, and psychological well-being and reduced pain levels.

The results of the current study reinforce the potential role of ICF-guided physiotherapy in improving various aspects of life for RA patients in palliative care. There was a significant improvement in the QoL of patients in the intervention group, as indicated by the SF-36 scores. Previous studies have also reported improved QoL in patients with chronic diseases following physiotherapy interventions [30]. This could be attributed to the multifaceted approach of the ICF, which includes physical, psychological, and social dimensions and is thus well-suited to address the complex needs of RA patients [31].

The physical functioning of the intervention group, as assessed by the HAQ, also significantly improved post-intervention, which aligns with earlier findings demonstrating the positive impact of physiotherapy on physical functioning in RA patients [32]. This improvement could be due to the fact that the ICF framework emphasises the enhancement of body functions and structures, along with promoting activity and participation [33].

The reduction in pain levels, as shown by the VAS scores, further highlights the effectiveness of ICF-guided physiotherapy. Such pain reductions could contribute to the improved QoL and physical functioning observed in the intervention group. Previous research has also noted that physiotherapy can lead to pain reduction in RA patients [34].

The improvements in psychological well-being, as per the HADS scores, indicate the comprehensive approach of ICF-guided physiotherapy. This finding is in line with previous research indicating that the inclusion of psychological aspects in physiotherapy interventions can lead to improved mental health outcomes in patients with chronic conditions [35].

In conclusion, this study underscores the potential benefits of ICF-guided physiotherapy in improving QoL, physical functioning, pain levels, and psychological well-being in RA patients undergoing palliative care. Future studies should aim to validate these findings in larger and more diverse populations.

Despite the promising findings, this study had several limitations. Firstly, as this was a pilot study, it is important to recognise that it cannot infer definitive causal relationships. Future research would benefit from a more extended trial to establish a cause-effect relationship between ICF-guided physiotherapy and improved outcomes for patients with RA. Secondly, our findings are based on a relatively small sample size. Future research should validate these findings in larger cohorts to enhance the generalisability of the results. Thirdly, the study was conducted in a single centre, which may introduce selection bias. Multi-centre studies should mitigate this limitation. Finally, more research is needed to understand the specific components of the ICF-guided physiotherapy intervention that are most beneficial.

Conclusions

The study found that ICF-guided home-based physiotherapy improved QoL, physical functioning, pain levels, and psychological well-being in patients with RA receiving palliative care. Using such an intervention might represent a valuable addition to the toolkit of healthcare professionals caring for this patient population.

Notwithstanding its limitations, the study has important clinical implications. The significant improvements in QoL, physical functioning, pain levels, and psychological well-being suggest that ICF-guided physiotherapy could be a valuable component of palliative care in RA patients. The ICF approach is comprehensive, addressing physical, psychological, and social aspects of health. Thus, incorporating ICF-guided physiotherapy into the treatment protocol may en-

hance the overall care provided to RA patients. Clinicians should consider adopting this approach and adapting it as necessary to fit the individual needs of their patients. Given the chronic nature of RA and the significant burden it places on patients, any interventions that can improve patient outcomes are worth considering.

In essence, our findings contribute valuable insights to the existing body of knowledge surrounding palliative care strategies for RA patients. The potential benefits of ICF-guided physiotherapy offer a promising avenue for future research and underline the importance of a comprehensive approach to patient care in this context. Further research in this area is eagerly anticipated and will be critical in our continued efforts to optimise palliative care for RA patients.

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Ethical approval

The research related to human use has complied with all the relevant national regulations and institutional policies, has followed the tenets of the Declaration of Helsinki, and has been approved by the Institutional Ethical Committee of Integral University, Lucknow, India (approval No.: IEC/IIMSR/2021/19, dated 07/09/2021).

Informed consent

Informed consent has been obtained from all individuals included in this study.

Disclosure statement

No author has any financial interest or received any financial benefit from this research.

Conflict of interest

The authors state no conflict of interest.

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