

**IMPROVING PATIENT'S QUALITY OF LIFE BY ASSESSING PAIN: A STRATEGY
TOWARDS MEDICATION RECONCILIATION IN A TERTIARY CARE HOSPITAL**

¹*Kheni Manav Rasik, ²Levaka Samyukta Reddy, ³M. K. Archana, ⁴Mohammed Shefeeq A.,
⁵Dr. Apurva Edward Pilli and ⁶Dr. Janaki R. Torvi

^{1,2,3,4}Pharm D Intern, Soniya Education Trust's College of Pharmacy, Dharwad.

⁵Pharm D, Associate Professor, Soniya Education Trust's College of Pharmacy, Dharwad.

⁶Professor, Department of Pharmacology, KIMS, Hubli.



*Corresponding Author: Kheni Manav Rasik

Pharm D Intern, Soniya Education Trust's College of Pharmacy, Dharwad.

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ABSTRACT

Aim: The purpose of this study is to assess a patient's quality of life along with assessing pain intensity, duration, frequency and how the treatment has eased the pain in patients' undergone surgery and orthopaedic procedures.

Materials & Methods: This study is a prospective mixed-method study which was conducted in a tertiary care hospital. The data was assessed using WILDA'S approaches, numerical rating scale (NRS), Wong-baker scale, behavioural pain scale (BPS) and patient QOL (SF-36). **Results:** The results showed that pain significantly affected various domains of QoL, primarily physical and emotional functioning. Despite the use of analgesics, pain persisted in a substantial proportion of patients. Medication reconciliation was found to be incomplete in 33.33% of cases. **Conclusion:** This study highlights the importance of comprehensive pain assessment and medication reconciliation in improving patient outcomes. A multidisciplinary approach that incorporates non-pharmacological therapies, such as physiotherapy or psychological care, is essential for optimizing pain management.

KEYWORDS: Pain assessment, Medication reconciliation, Quality of life (QoL), Pain management.

INTRODUCTION

Pain, a tapestry woven from physiology, psychology, and environment, disrupts more than just physical comfort. Defined by the IASP as an unpleasant sensory and emotional experience reflecting tissue damage, pain manifests in acute and chronic forms, demanding a nuanced approach.^[1]

Beyond physical discomfort, pain affects emotional well-being, daily activities, and relationships.^[2] Its intensity varies with individual differences, pain type, and underlying conditions^[3], yet pain doesn't equate to poor quality of life (QoL). A multidisciplinary approach acknowledging its multifaceted nature is key.^[3]

Within our brain's intricate neural networks lies the processing center for pain stimuli.^[4] Acute pain, associated with tissue healing, follows a predictable trajectory, while chronic pain persists due to faulty processing.^[5] Nociceptive pain is a direct response to tissue damage, it alerts us to potential harm whereas neuropathic pain arising from nerve tissues can manifest as burning, tingling, or shooting sensation, even without tissue damage.

Effective pain management hinges on a comprehensive assessment considering location, intensity, description, temporal pattern, and impact on daily life. The PQRSTU mnemonic guides this process and personalizes treatment plans.^[6]

Treatment choice depends on the pain type and severity. Nociceptive pain: Often finds relief in the WHO 3-step ladder, starting with non-opioids and progressing to stronger medications if needed.^[5] Neuropathic pain: Identification and addressing nerve issues takes precedence, followed by targeted medications like antidepressants or anticonvulsants.^[5]

QoL, encompassing physical, psychological, social, and environmental factors, is deeply intertwined with pain management. Alleviating pain paves the way for improved functionality, enhanced well-being, and a richer QoL.^[3]

Medication reconciliation, a crucial process during transitions of care, plays a vital role in minimizing medication errors and safeguarding patient safety. By ensuring accurate and comprehensive medication lists,

we can significantly reduce adverse events and prevent unnecessary hospitalizations.^[7,8]

Pain may be complex and multifaceted, but it doesn't have to define our lives. By understanding its underpinnings, tailoring interventions, and focusing on improving QoL, we can empower individuals to live fulfilling lives even with pain.

MATERIALS AND METHODS

Design and Setting: This prospective mixed-methods study (6 months, Jan-Jun 2022) explored pain management in post-operative and orthopaedic patients at KIMS Hospital, Hubli.

Participants: 150 patients.

Inclusion criteria: Patients of age above 17 years undergoing surgery/orthopaedic procedure were recruited consecutively.

Exclusion criteria: Pregnant/lactating individuals and outpatients.

Data Collection: Quantitative: Demographics, pain assessment (WILDA, NRS, Wong-Baker, BPS), patient QOL (SF-36), medication reconciliation (WHO high 5's). Qualitative: Semi-structured interviews on pain experience, medication adherence, and pain management satisfaction.

Data Analysis

Quantitative: Descriptive statistics and inferential analysis (t-test, ANOVA) as appropriate.

Qualitative: Thematic analysis to identify key themes and subthemes.

Mixed-Methods Triangulation: Integrated findings for enhanced understanding.

Ethical Considerations: Institutional ethically approved, Informed consent and participant confidentiality are ensured.

RESULTS

This prospective mixed-method study was conducted in a tertiary care hospital. The aim of the study was to assess the quality of life by assessing pain and the importance of introducing medication reconciliation in the healthcare sector. A total of 150 patients from the post-operative and orthopaedics departments were included in the study.

Demographic profile

The study aimed to collect data from individuals across various age groups and gender identities. The largest share of the participants, 24% of the total, belonged to the age group of 31-40 years. Among the respondents, 51.33% identified as male and 48.67% as female. The study was conducted by interviewing 150 participants to ensure a comprehensive understanding of the topic.

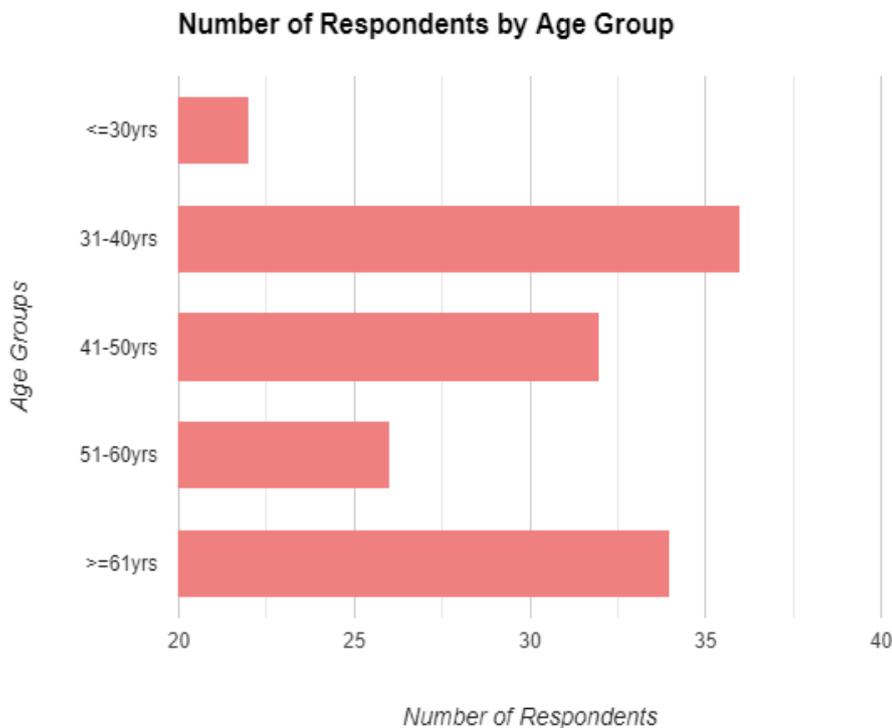


Figure 01: Age Distribution of Respondents.

Percentage of Respondents by Gender

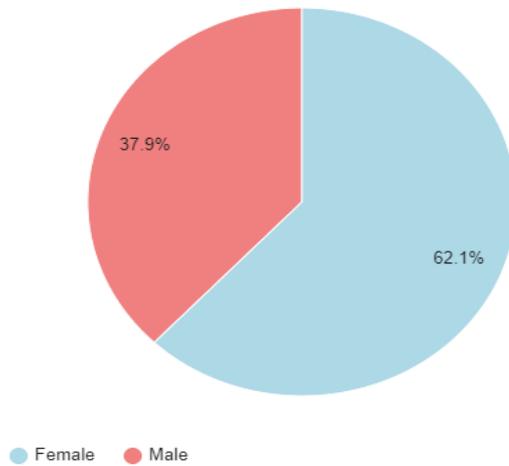


Figure 02: Gender Distribution of Respondents.

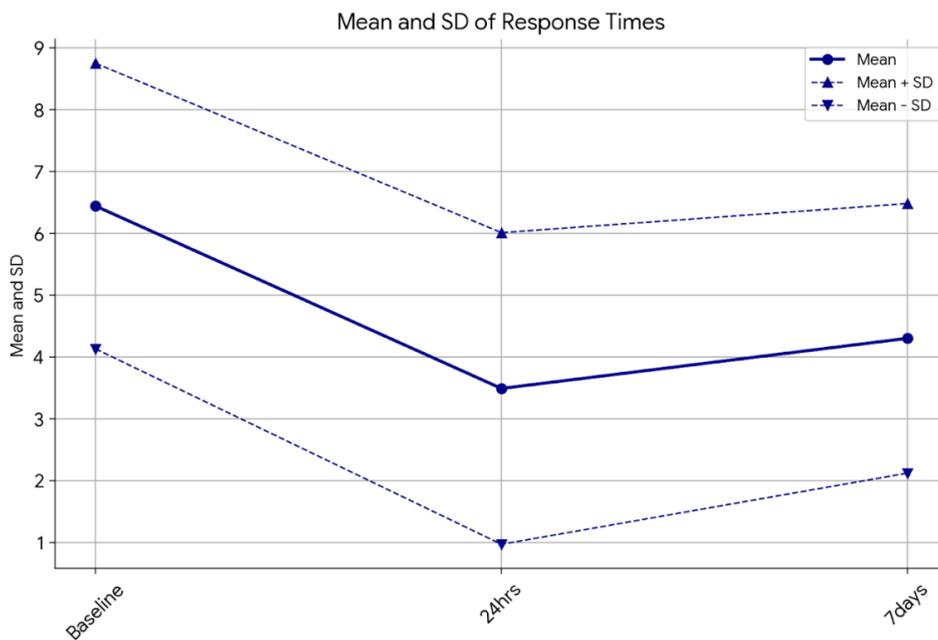
History-wise distribution

In this study, history data from 150 case sheets was collected in which the majority of the history documented was complete 100 (66.66%), 50 (33.33%) were found to be incomplete.

that there was a significant relationship between pain scores taken at different treatment time points. There was a 45.76% change in pain from the baseline in the first 24 hours. 33.23% change in pain from the baseline and 7 days and -23.09% change in pain from 24 hours to 7 days.

Comparison of pain scores at different treatment times by Wilcoxon matched pairs test

A comparison of pain scores at different treatment timelines using the Wilcoxon matched pair test showed



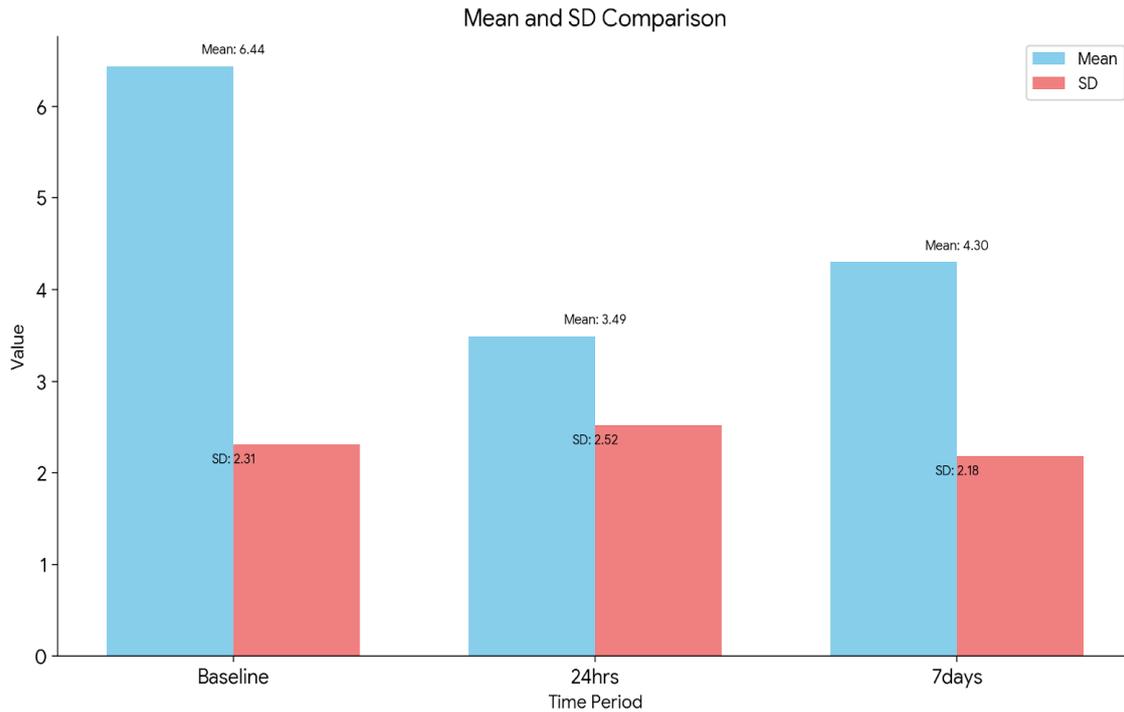


Figure 3: (a) and 3(b): Comparison of pain scores at different treatment time points by Wilcoxon matched pairs test.

Pain-related factors

According to the study, respondents experienced varying degrees of pain. Moderate pain was reported by 38.00% of participants, while 32.67% and 18.67% experienced severe and extreme pain, respectively. A small percentage of respondents, 3.33%, reported no pain, and 7.33% reported mild pain. This indicates that pain experiences vary among the investigated individuals. The duration and frequency of pain episodes also varied among respondents. Pain lasting for the last 7 days was reported by 36.00%, 24.00% experienced pain in the previous 3 months, and 18.67% had been in pain for over

3 months. Regarding frequency, 47.33% reported infrequent pain, while 26.00% and 26.67% reported frequent and constant pain, respectively. This indicates the complexity of pain experiences within the surveyed group.

The survey also revealed that treatment efficacy was positive, with 50.67% of participants reporting complete relief in the last 24 hours. Additionally, 58.67% of respondents had a complete treatment chart, 20.00% lacked day-wise documentation, and 21.33% had an incomplete treatment chart.

Table 01: Pain-related factors.

	No of respondents	% of respondents
Status of verbal pain		
No pain	5	3.33
Mild	11	7.33
Moderate	57	38.00
Severe	49	32.67
Extreme	28	18.67
Onset of pain		
Since 2 days	5	3.33
Since 4 days	3	2.00
Since 5 days	5	3.33
Last 7 days	54	36.00
Since 15 days	6	4.00
Since 20 days	4	2.67
Last 1 month	9	6.00
Last 3 months	36	24.00
> 3 months	28	18.67
Frequency of pain		

Constant	40	26.67
Frequent	39	26.00
Infrequent	71	47.33
How much treatment has eased pain last 24hrs		
Complete relief	76	50.67
Moderate relief	39	26.00
Mild relief	28	18.67
No relief	7	4.67
Treatment Chart		
Complete	88	58.67
Incomplete	32	21.33
No treatment chart documented in day wise	30	20.00
Total	150	100.00

Correlation between age in years and components of QOL by Spearman’s rank correlation

The analysis revealed a statistically significant negative correlation between age and Role Limitations due to Emotional Problems (Spearman R = -0.2393, p = 0.0032*) and Overall QOL (Spearman R = -0.1634, p =

0.0457*). This implies that as individuals age, there is a noteworthy tendency for a reduction in limitations related to emotional well-being and an overall decrease in Quality of Life. Other QOL components did not exhibit a statistically significant correlation with age.

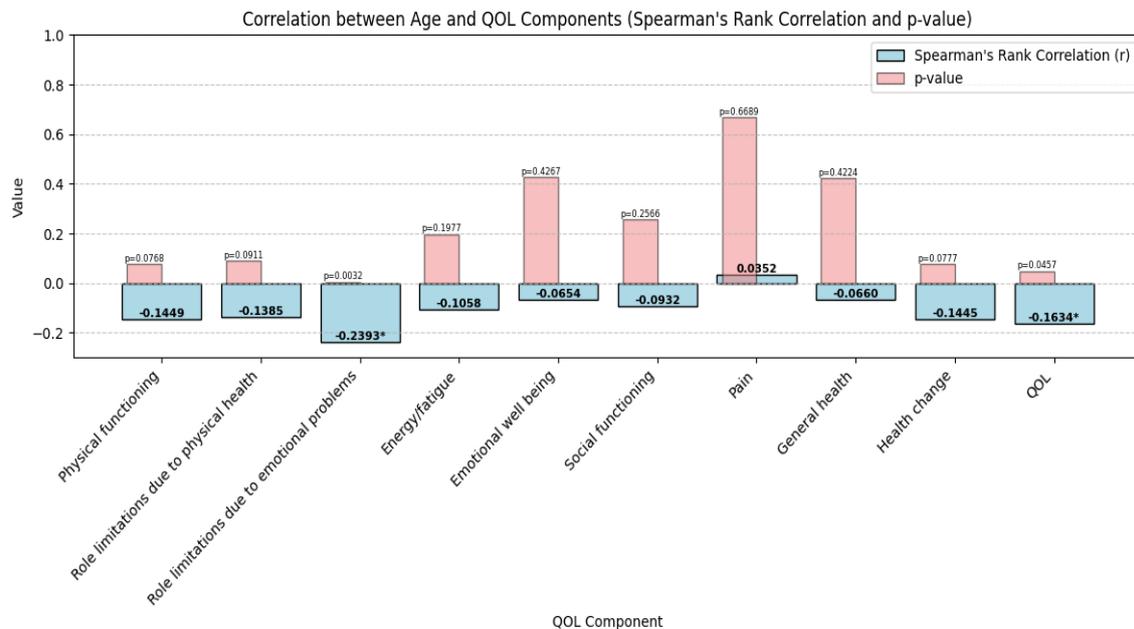


Figure 04: Correlation between age in years and components of QOL by Spearman’s rank correlation.

Correlation between pain at different treatment times and components of QOL by Spearman’s rank correlation

This analysis provides compelling evidence for pain's detrimental impact on various aspects of well-being. Pain presented at baseline, after 24 hours and after 7 days significantly impaired physical functioning (Spearman R: -0.3067 to -0.2360, p < 0.0036). This highlights a clear dose-dependent relationship: higher pain translates to diminished physical capabilities.

Furthermore, pain negatively affected participation in activities due to both physical (Spearman R: -0.1698 to -0.1991, p < 0.0378) and emotional limitations (Spearman R: -0.2362 to -0.1866, p < 0.0222). This suggests that

pain not only restricts physical movement but also hinders emotional well-being and fulfilling social roles.

Interestingly, pain relief exhibited a beneficial effect, with reduced pain at 24 hours positively correlating with improved physical functioning (Spearman R: 0.2792, p = 0.0005). This finding underscores the importance of effective pain management in regaining physical capabilities.

While no significant correlations were observed between pain and energy/fatigue, emotional well-being, or social functioning at any time point, the consistent negative association with general health (Spearman R: -0.1149 to -0.0086) indicates a perceived decline in overall well-being with increased pain.

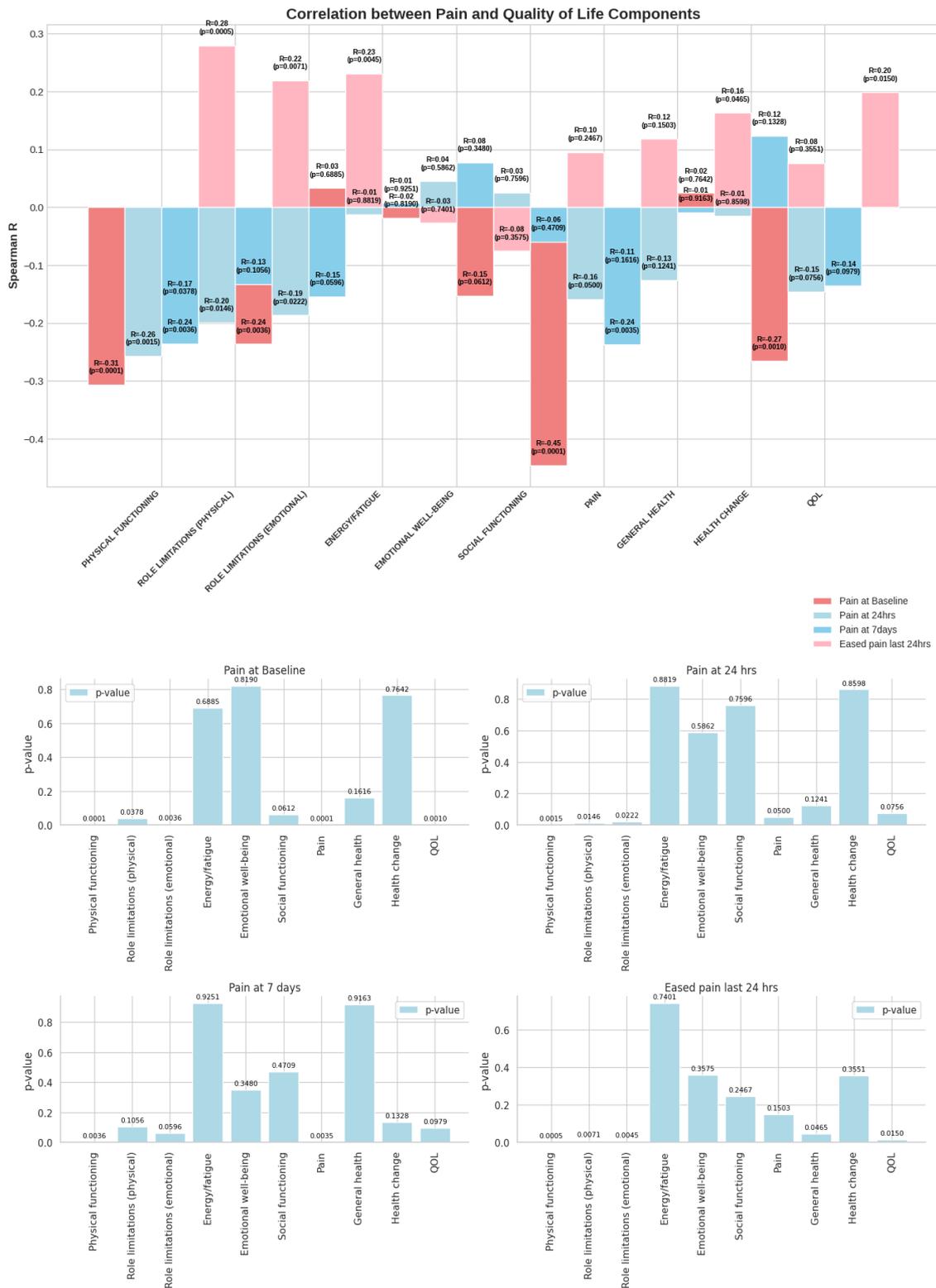


Figure 05(a) and 05(b): Correlation between pain at different treatment times and components of QOL by Spearman's rank correlation.

Correlation between other factors and components of QOL by Spearman's rank correlation

Physical functioning exhibited a positive correlation with nausea (Spearman R = 0.2527, p = 0.0021*) while demonstrating negative correlations with sleep disturbance (Spearman R = -0.2807, p = 0.0006*) and

appetite change (Spearman R = -0.0074, p = 0.9290). Notably, a strong negative correlation was observed between physical functioning and physical change (Spearman R = -0.6522, p = 0.0001*).

Role limitations due to physical health also displayed significant correlations with QOL components. Positive correlations were found with nausea (Spearman R = 0.1939, p = 0.0190*) and sleep disturbance (Spearman R = -0.2223, p = 0.0070*), while negative correlations were identified with appetite change (Spearman R = -0.0510, p = 0.5408) and physical change (Spearman R = -0.5122, p = 0.0001*).

Similar trends were observed in the relationship between role limitations due to emotional problems and QOL components. Positive correlations were evident with nausea (Spearman R = 0.1592, p = 0.0500*) and sleep disturbance (Spearman R = -0.2577, p = 0.0017*), while negative correlations were noted with appetite change (Spearman R = -0.0494, p = 0.5540) and physical change (Spearman R = -0.4158, p = 0.0001*).

Emotional well-being displayed a significant negative correlation with sleep disturbance (Spearman R = -0.1917, p = 0.0205*), while social functioning revealed a negative correlation with physical change (p=0.0044*). Pain strongly correlated negatively with physical change (Spearman R = -0.3360, p = 0.0001*).

General health demonstrates a positive correlation with nausea (p=0.1349) and negative correlations with sleep disturbance (p=0.0264*) and health change (p=0.0083*). A robust negative correlation is evident with physical change (p=0.0001*).

Health change exhibits a substantial negative correlation with physical change (p=0.0092*), whereas QOL showcases negative correlations with sleep disturbance (p=0.0008*) and a robust negative correlation with physical change (p=0.0001*).

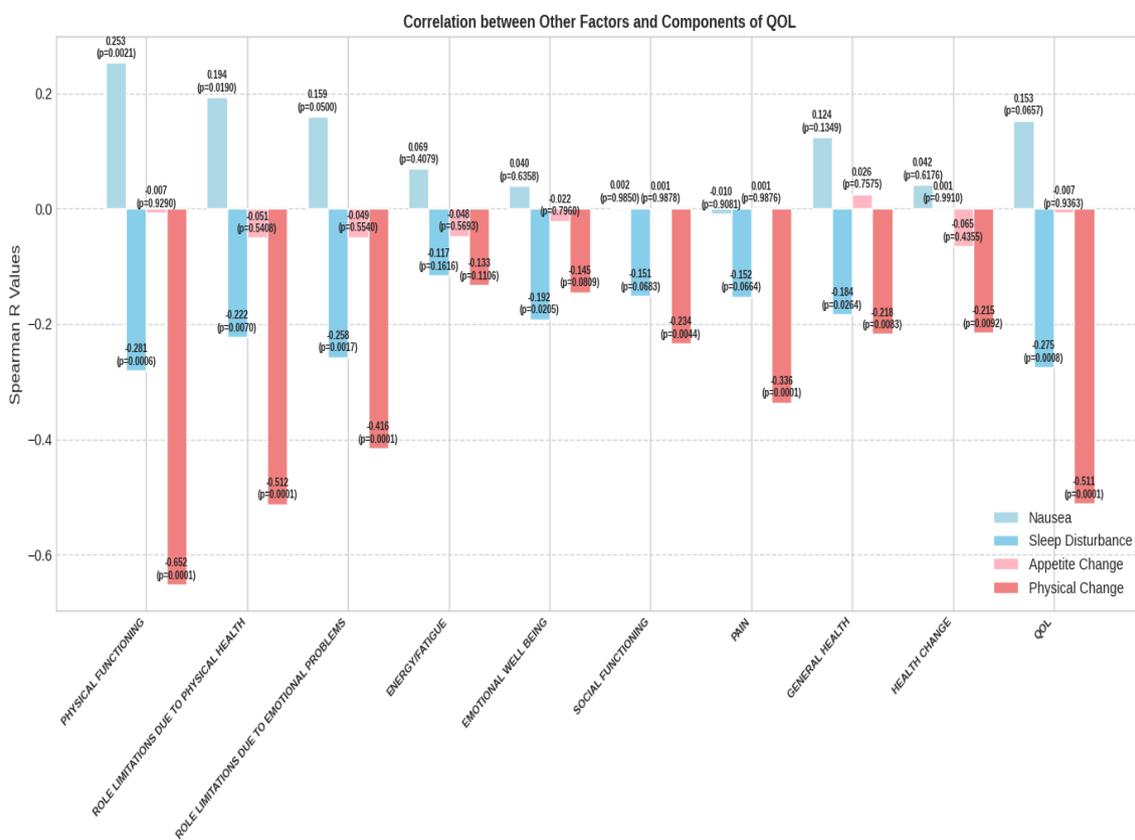


Figure 06: Correlation between other factors and components of QOL by Spearman’s rank correlation.

Correlation between the number of drugs given and components of QOL by Spearman’s rank correlation

Our findings revealed that the variables of QOL exhibited no significant correlation with the number of drugs prescribed, implying a lack of clear association in this domain.

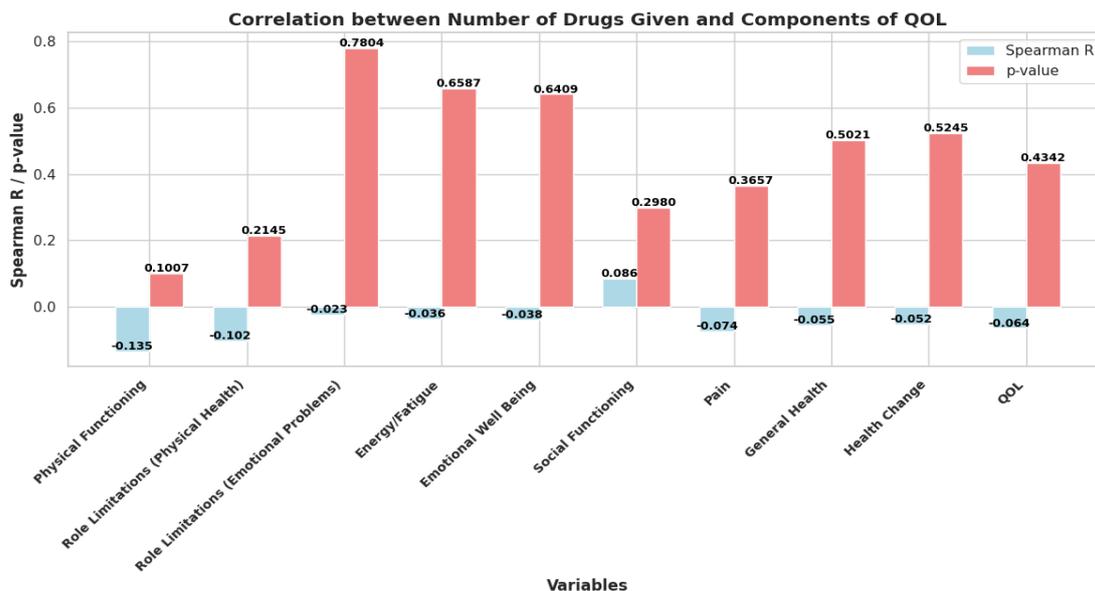


Figure 07: Correlation between the number of drugs given and components of QOL by Spearman’s rank correlation.

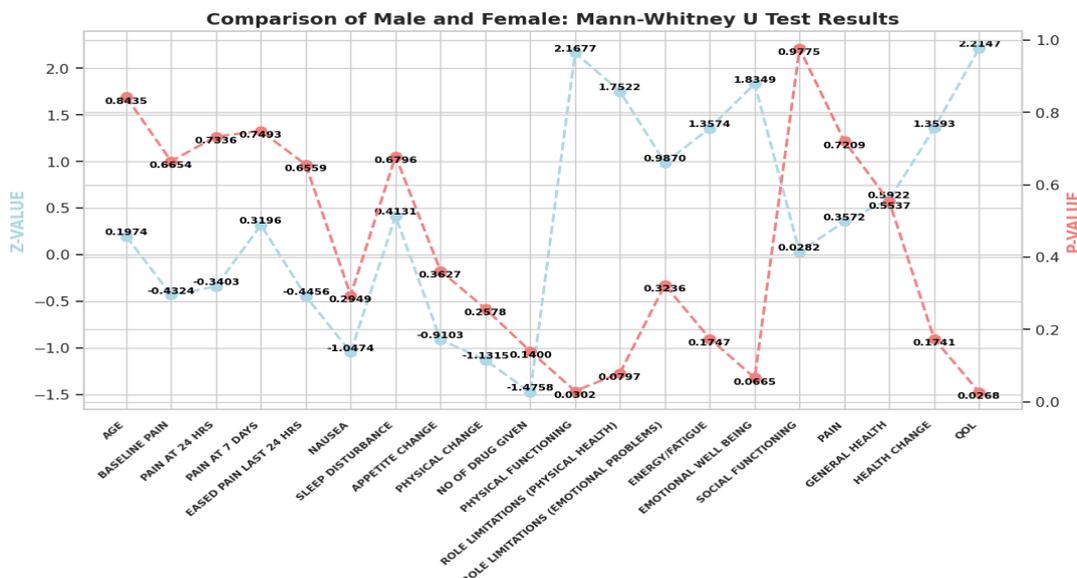
Comparison of males and females with all variables by Mann-Whitney U test

Our analysis of demographic characteristics and pain scores revealed no significant differences between male and female participants. Notably, Z scores for age, baseline pain, pain at 24 hours, and pain at 7 days all ranged around 0.20, with p-values exceeding 0.80, indicating comparable distributions across genders.

Similarly, subjective experiences like nausea ($Z = -1.0474$, $p = 0.2949$), sleep disturbance ($Z = 0.4131$, $p = 0.6796$), appetite change ($Z = -0.9103$, $p = 0.3627$), and physical change ($Z = -1.1315$, $p = 0.2578$) displayed no statistically significant gender-based disparities. Although males received slightly more drugs on average (numerical discrepancy), this difference did not reach statistical significance ($Z = -1.4758$, $p = 0.1400$).

However, gender-based disparities emerged in physical functioning and role limitations due to physical health. Males demonstrated significantly higher mean ranks in physical functioning ($Z = 2.1677$, $p = 0.0302^*$), potentially indicating an advantage in this domain. Conversely, females reported higher, non-significant trends in role limitations due to physical health ($p = 0.0797$). Emotional well-being also trended slightly higher among females, but this difference did not achieve statistical significance ($p = 0.0665$).

Overall, our findings suggest that while subjective experiences and pain perception are comparable between genders, males may possess advantages in physical functioning, while females may experience greater limitations due to physical health.



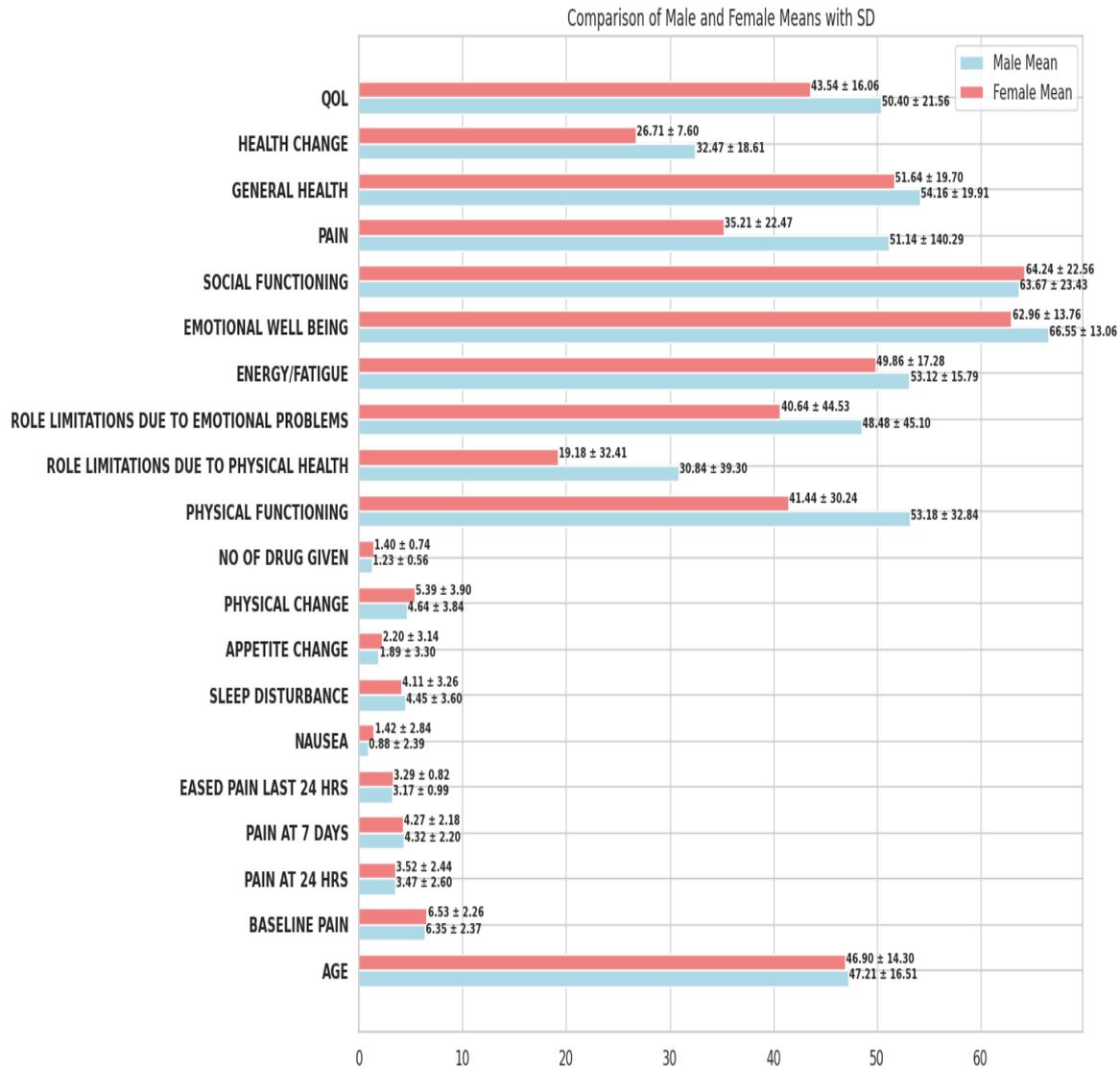


Figure 8(a) and 8(b): Comparison of males and females with all variables by Mann-Whitney U test.

Comparison of frequencies of pain with all variables by Kruskal Wallis ANOVA

Across the spectrum of pain frequencies—constant, frequent, and infrequent—significant differences were observed in the domains of physical functioning ($H = 5.8960, p = 0.0500^*$), role limitations due to emotional problems ($H = 5.9270, p = 0.0500^*$), and overall quality of life (QOL) ($H = 5.9750, p = 0.0500^*$).

Specifically, individuals experiencing constant pain exhibited lower mean scores in Physical Functioning ($M = 42.13, SD = 31.56$) compared to those with frequent ($M = 40.26, SD = 32.22$) and infrequent pain ($M = 54.44, SD = 31.17$). Similarly, participants with constant pain reported higher Role Limitations due to Emotional Problems ($M = 54.46, SD = 45.51$) compared to frequent ($M = 36.74, SD = 43.80$) and infrequent pain ($M = 35.00, SD = 42.00$). The Quality of Life scores were also lower for constant pain ($M = 43.33, SD = 15.30$) compared to

frequent ($M = 43.32, SD = 15.90$) and infrequent pain ($M = 51.22, SD = 22.23$).

Furthermore, the variable of pain demonstrated a statistically significant impact on emotional well-being ($H = 10.1680, p = 0.0060^*$), with distinct mean variations observed among constant, frequent, and infrequent pain categories.

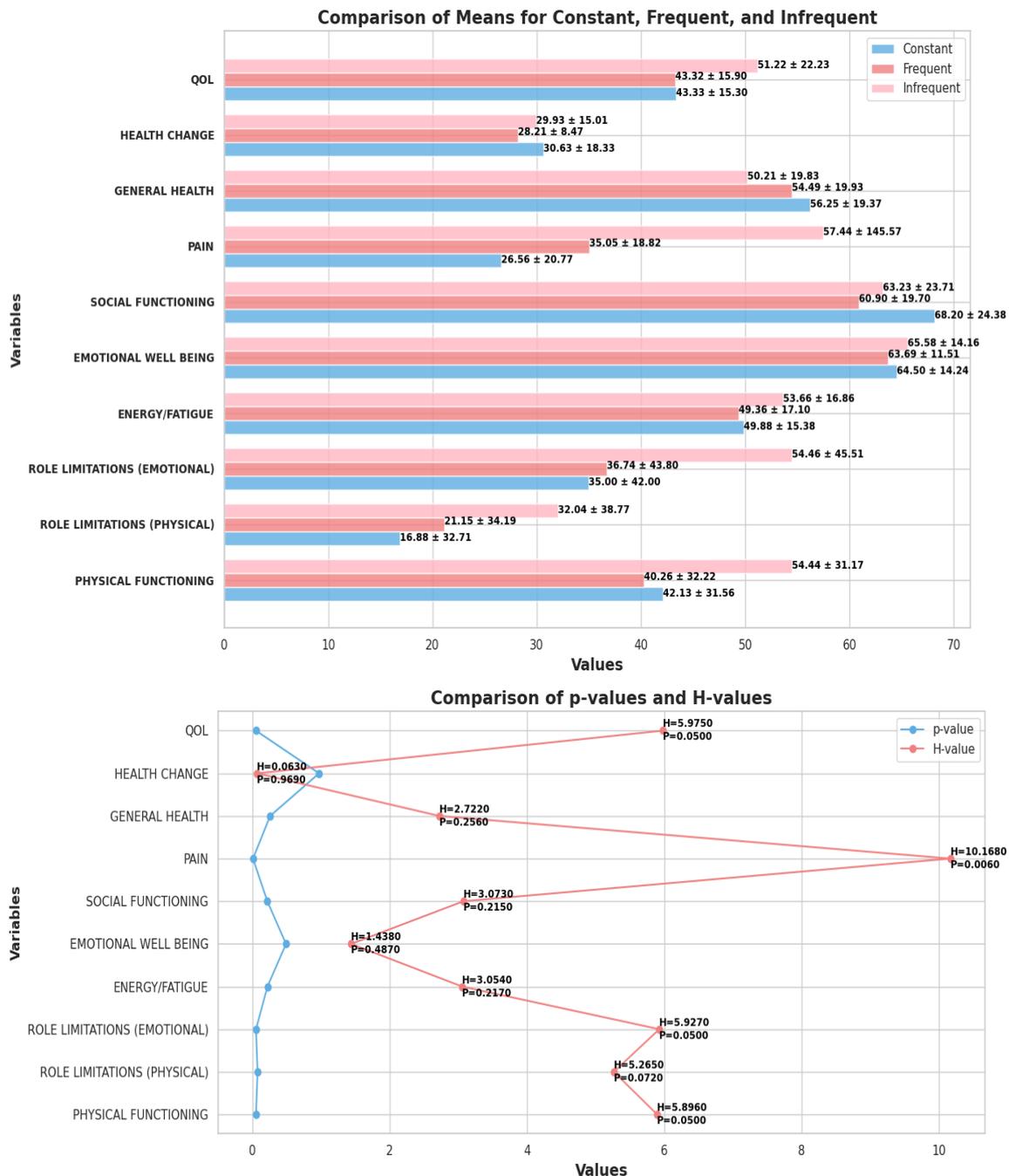


Figure 9(a) and 9(b): Comparison of frequencies of pain with all variables by Kruskal Wallis ANOVA.

DISCUSSION

Qualitative and quantitative data of 150 patients were collected from pre and post-orthopaedic departments as well as post-surgery departments in Karnataka Institute of Medical Science, Hubli.

The participants made references to the physical sensations of pain when demarcating categories of pain measure. This included the intensity of pain, type of pain, longevity, constancy, and qualities of pain.

Demographic analysis shows the distribution of samples according to age. Out of 150 patients, the majority came under the age group of 31-40 (24%), followed by

patients above 60 years (22.66%) and 41-50 (21.33%), respectively. The lowest number of patients was of the age group less than 30 years, with 22 (14.67%) as the frequency. Age has long been the focus of research on pain perception and pain tolerance; the study shows that the elderly require a higher intensity of noxious stimuli than younger patients before they report pain. Experts in the field of pain management have concluded that if pain perception is diminished in the elderly person, it is most likely secondary to a disease process rather than to ageing.

These findings showcase the crucial role of history-taking in medication reconciliation by revealing a stark

gap between complete and incomplete histories. With 66.67% of respondents providing complete details and 33.33% remaining incomplete, it emphasises the potential impact of thorough information gathering on medication safety. Therefore, a complete and accurate history acts as the key conductor in the medication reconciliation. Medications, allergies, diagnoses, and patient experiences are harmonised, resulting in a safe and effective medication regimen.

The study's findings, analysed in comparison with relevant literature, highlight notable patterns in pain dynamics over distinct treatment time points. The immediate and substantial 45.76% reduction in pain scores within the first 24 hours aligns with established research emphasising the prompt efficacy of certain interventions.^[9] Moreover, the sustained 33.23% reduction in pain at the 7-day mark underlines the importance of interventions with lasting impact.^[10] However, the unexpected -23.09% change in pain scores from 24 hours to 7 days introduces a novel aspect, suggesting a potential adaptation or diminishing treatment effect.^[10] This unexpected decline raises critical questions about the underlying mechanisms and prompts the need for further exploration into factors influencing this adaptation, ultimately informing more effective and personalised pain management strategies in clinical practice.

The analysis of pain-related factors among the surveyed population emphasises the diverse nature of pain experiences. A significant proportion reported moderate pain, aligning with existing literature on the prevalence of this category (Breivik *et al.*, 2006).^[11] Severe and extreme pain were also commonly reported by a substantial number of respondents, enhancing the multifaceted nature of pain intensity (Fillingim *et al.*, 2009).^[12] Conversely, a notable percentage claimed to have no pain, while others reported experiencing mild pain, showcasing the variability of pain experiences within the group. Regarding pain duration, participants reported instances of recent onset and chronic conditions, with a considerable number indicating pain lasting for the last 7 days and the last 3 months. This aligns with research indicating the coexistence of acute and chronic pain (Blyth *et al.*, 2019).^[13] The variation in pain frequency further underscores the dynamic nature of pain episodes, with a considerable percentage reporting infrequent pain, while others experienced frequent or constant pain. While positive trends in treatment efficacy were observed, with a noteworthy 50.67% reporting complete relief in the last 24 hours, challenges persist, as 4.67% of individuals reported no relief, highlighting ongoing complexities in achieving universal efficacy in pain interventions. Treatment documentation practices revealed room for improvement, emphasising the need for consistent and comprehensive recording, as 58.67% of respondents have a complete treatment chart, while 20.00% lack day-wise records and 21.33% have incomplete charts (Kroenke & Krebs, 2016).^[14]

Personalized pain management interventions are necessary, and careful documentation practices are required for optimising pain management strategies. The diverse landscape of pain experiences among the respondents highlights the importance of a multidisciplinary approach to pain management.

The findings of Spearman's rank correlation analysis that investigated the relationship between age and Quality of Life (QOL) in a cohort of 150 participants have revealed some interesting details regarding the impact of age on various dimensions of QOL. The analysis showed a significant negative correlation between age and 'Role Limitations due to Emotional Problems' and 'Overall QOL.' This suggests that there is a reduction in limitations related to emotional well-being and a decrease in QOL with ageing. Although there were non-significant trends in other QOL components, such as Physical Functioning and Role Limitations due to Physical Health, this analysis highlights potential areas for further exploration with larger sample sizes. The observed weak but statistically significant negative correlation between age and overall QOL stresses the importance of addressing emotional well-being in the context of an ageing population. This comprehensive analysis contributes valuable insights, aligning with previous research and emphasising the need for further exploration into the relationship between age and QOL across different dimensions. (Furtado GE 2020).^[15]

The presented results, employing Spearman's rank correlation coefficients to assess the relationship between pain at different treatment times and components of Quality of Life (QOL), align with existing literature on pain's multifaceted impact on well-being. Consistent with prior studies (Alade Y 2012),^[16] the negative correlations between pain and physical functioning underscore the detrimental effects of heightened pain levels on an individual's ability to perform daily activities. Moreover, the positive correlation between eased pain and improved physical functioning resonates with interventions targeting pain relief to enhance overall functional capacity (Cascella M 2023).^[17] The observed negative correlations between pain and role limitations due to physical and emotional health substantiate findings from related research (Dueñas M, 2016),^[18] emphasising the pervasive influence of pain on both domains. The consistent negative correlation between pain and general health aligns with broader literature (Idler EL 1993),^[19] emphasising the overarching impact of pain on perceived health status. The positive correlation between prolonged pain and a more positive perception of health improvement at 7 days introduces an intriguing aspect, warranting further investigation into the potential psychological aspects of coping with persistent pain. Overall, these findings contribute valuable insights into the complex interplay between pain and QOL, supporting the need for targeted interventions to address pain for comprehensive improvements in physical and emotional well-being.

The Spearman's rank correlation analysis on 150 participants reveals key associations between various health factors and Quality of Life (QOL). Noteworthy correlations include the positive link between physical functioning and nausea and negative associations with sleep disturbance, appetite and physical change. Role limitations due to physical and emotional health also show significant correlations with QOL components. These findings align with Hall SA et al. (2011)^[20] regarding physical functioning's impact on QOL and Katz N et al. (2002)^[21] emphasising the role of pain. The study contributes nuanced insights into social functioning's impact on physical change, supported by Geigl C et al. (2023).^[22] However, weaker correlations for energy/fatigue, emotional well-being, and social functioning resonate with Lestari SK et al. (2021),^[23] suggesting their less direct role in specific QOL components. This study enriches understanding and provides foundations for targeted interventions and holistic healthcare strategies.

While the presented investigation delves into the relationship between medication burden and Quality of Life (QOL) in a cohort of 150 participants, it's crucial to note that the findings, particularly those demonstrating a weak negative correlation between the number of drugs and Physical Functioning, align with existing literature. Numerous studies, such as those by Katsimpris A et al. (2019)^[24] and Giummarra MJ et al. (2015),^[25] have highlighted the potential adverse effects of polypharmacy on physical well-being, supporting the notion that increased medication burden may indeed lead to decreased physical functioning. However, the lack of statistically significant correlations in certain QOL components, as observed in the domains of Role Limitations due to Emotional Problems, Social Functioning, and others, is consistent with the nuanced and multifaceted nature of the medication-QOL relationship. This resonates with the findings of recent reviews by Van Wilder L et al. (2022),^[26] emphasising the complexity of the interplay between medication regimens and diverse aspects of patient well-being.

No significant gender-based disparities were observed in demographic characteristics, emphasising the importance of balanced representation in research cohorts. The distinctions in physical functioning mirror the findings of Sialino LD et al. (2022),^[27] underlining the complexity of gender-related dynamics in this domain. According to LeResche L et al. (2011),^[28] personalised healthcare interventions tailored to gender-specific health considerations are crucial. This study reinforces the significance of adopting individualised strategies to achieve better outcomes for patients.

The present study, employing Kruskal-Wallis analysis of variance (ANOVA), contributes valuable insights into the intricate relationship between pain frequency and various health-related variables, aligning with prior research on the multidimensional impact of pain on

individuals' well-being (Penny KI et al. 1999).^[29] Significant differences observed in physical functioning, role limitations due to emotional problems, and overall quality of life across different pain frequencies underscore the need for nuanced interventions tailored to the specific emotional challenges associated with varying pain frequencies. The study's strengths lie in its robust statistical approach and the comprehensive exploration of various health dimensions. The findings emphasise the importance of adopting a holistic approach to pain management in clinical practice, considering the diverse dimensions of individuals' health and well-being.

CONCLUSION

Our study unveils the critical role of individualised pain management strategies, emphasising the necessity for comprehensive approaches that address both the physical and psychological manifestations of pain. Individually tailored treatment plans, customised to each patient's unique pain experience, medical history, and other relevant factors, emerged as key to achieving optimal pain relief. This study further underscores the vital role of clinical pharmacists in optimising medication regimens. By providing expert advice on medication selection, dosage, and monitoring, clinical pharmacists play a pivotal role in minimising medication errors, ensuring effective treatment, and ultimately, improving patient outcomes. Our findings shed new light on the importance of medication reconciliation, which involves identifying and resolving medication discrepancies across all healthcare settings.

In conclusion, this study provides valuable insights into pain management in hospitalised patients, emphasising the importance of individualised care, multidisciplinary collaboration, and the crucial role of clinical pharmacists. Future research should continue to explore gender differences in pain and develop effective strategies to improve pain management and enhance patient quality of life.

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