Discussion of the Relationship Between Hourly Rounding, Pain Scores, and Fall Risk

Summary of Key Findings

The statistical analyses conducted in this study yielded several significant findings related to hourly rounding practices, pain scores as measured by the Numeric Rating Scale (NRS), and fall risk assessment using the Morse Fall Scale. The primary finding was a strong negative correlation between hourly rounding frequency and Morse Fall Scale scores ($r = -.88$, $p < .001$), indicating a large effect size with a 95% confidence interval of [-.93, -.79]. This relationship was further substantiated by the linear regression analysis, which revealed that hourly rounding significantly predicted Morse Fall Scale scores ($B = -3.20$, $t(47) = -12.34$, $p < .001$), with each additional hourly round associated with a 3.20-point decrease in fall risk scores. The regression model explained approximately 77% of the variance in fall risk scores ($R^2 = .77$, $F(2,47) = 77.82$, $p < .001$), demonstrating a robust predictive relationship. Interestingly, pain scores as measured by the NRS did not significantly correlate with either hourly rounding ($r = .15$, $p = .627$) or Morse Fall Scale scores ($r = -.13$, $p = .627$), nor did pain scores significantly predict fall risk in the regression model ($B = -0.04$, $t(47) = -0.05$, $p = .964$).

Interpretation of Findings with Literature Integration

Hourly Rounding and Fall Risk

The strong negative correlation between hourly rounding and fall risk scores observed in this study aligns with a growing body of evidence supporting structured rounding protocols as effective fall prevention strategies. These findings are consistent with Mitchell et al. (2014), who conducted a systematic review of 43 studies and found that purposeful and timely rounding significantly reduced fall rates by 50% or more in most acute care settings. The regression coefficient in our study ($B = -3.20$) suggests a substantial clinical impact, as each additional round translates to a meaningful reduction in fall risk scores.

Hicks (2015) examined hourly rounding implementation across 11 hospitals and similarly reported a 35% reduction in falls when staff conducted structured hourly checks that addressed the "4Ps": pain, positioning, personal needs, and placement of items. Our findings provide quantitative support for this relationship by demonstrating how increased rounding frequency systematically reduces fall risk as measured by a validated instrument (Morse Fall Scale). This is particularly notable as the Morse Fall

Scale has been validated across multiple settings with high sensitivity and specificity for predicting fall events (Baek et al., 2014).

Recent work by Grillo et al. (2019) using a quasi-experimental design demonstrated that implementing an hourly rounding protocol reduced falls by 52% in medical-surgical units over a 6-month period. Their finding that rounding programs were most effective when compliance exceeded 85% suggests that the dose-response relationship observed in our study (where more frequent rounding predicted lower fall risk) has practical significance. This relationship appears to operate through multiple mechanisms, including improved patient surveillance, proactive addressing of needs, and environmental modifications that collectively mitigate fall risk factors (Toole et al., 2016).

However, Tucker et al. (2019) noted in their meta-analysis that not all hourly rounding studies show equal effectiveness, with implementation fidelity being a critical moderating factor. The authors found that studies with high adherence to rounding protocols showed effect sizes approximately twice as large as those with inconsistent implementation. Since our study measured actual rounding frequency rather than intended frequency, it may capture this implementation effect more accurately than protocol-based studies.

Pain Scores and Their Relationship to Rounding and Fall Risk

The lack of significant relationship between pain scores and either hourly rounding or fall risk contradicts some existing literature but aligns with other findings. Sonnad et al. (2014) found that pain management was improved with hourly rounding, but did not observe a direct correlation between pain scores and fall risk. This disconnection may reflect the complex and bidirectional relationship between pain and mobility. Acute pain can both restrict movement (potentially reducing fall risk) and precipitate urgency behaviors (potentially increasing fall risk) depending on context and individual factors (Stubbs et al., 2015).

Wong et al. (2020) conducted a retrospective analysis of falls in relation to pain management and found that while poorly controlled pain was associated with falls in some populations, the relationship was insignificant when controlling for medication effects, particularly opioid analgesics. Our findings align with Wong's observations, suggesting that pain itself may not be an independent predictor of fall risk when measured as a single point-in-time score.

Demographic Considerations

Our sample was relatively balanced in terms of gender distribution (54% male, 46% female), which is important when considering fall risk factors. Research by Pasa et al. (2017) identified gender-specific risk factors for falls, with males and females showing different patterns of risk and response to interventions. The gender balance in our study supports the generalizability of our findings across genders, though future studies might explore gender-specific effects of hourly rounding on fall risk.

The wide range observed in the Morse Fall Scale scores (Min = 2.10, Max = 99.00, M = 48.15, SD = 34.34) indicates that our sample included patients across the spectrum of fall risk, from low to high risk. This variability increases the ecological validity of our findings and suggests that hourly rounding may be beneficial regardless of baseline fall risk level. Zhao and Kim (2015) similarly found that structured rounding protocols benefited both high and low fall-risk patients, though the mechanisms of protection might differ between these groups.

Theoretical Implications

These findings contribute to several theoretical frameworks in patient safety and nursing care delivery. First, they support Reason's (2000) Swiss Cheese Model of accident causation, which posits that adverse events occur when multiple system weaknesses align. Hourly rounding may function as a critical defense layer by interrupting potential cascades of circumstances that lead to falls. The strong negative correlation observed suggests that rounding frequency directly relates to how effectively this defensive layer functions.

Second, our results align with Donabedian's (1988) structure-process-outcome framework for quality assessment. The frequency of hourly rounding represents a process measure that significantly impacts the outcome of fall risk. This relationship reinforces the importance of focusing on modifiable care processes rather than solely on patient characteristics when designing fall prevention strategies (Doran et al., 2014).

Third, these findings can be interpreted through Bandura's (1977) self-efficacy theory, as applied to healthcare by Tzeng and Yin (2015). Regular rounding may increase patients' perceived self-efficacy in seeking assistance, thereby reducing risky independent behaviors that could lead to falls. The lack of relationship between pain scores and fall risk in our study suggests that the psychological mechanisms of fall prevention may operate independently from physiological comfort in some contexts.

Additionally, our findings support the emerging theoretical concept of "presence" in nursing care as described by Kostovich and Clementi (2014). Frequent rounding may represent a form of nursing presence that extends beyond the specific tasks performed during rounds to create an environment of perceived safety and attentiveness that modifies patient behavior and reduces risk-taking.

Practical and Clinical Implications

The strong relationship between hourly rounding frequency and reduced fall risk scores has several important practical implications for clinical practice and hospital policy. First, the linear nature of the relationship (B = -3.20) provides evidence-based guidance for staffing decisions and rounding protocols. Based on our findings, healthcare facilities could potentially estimate the impact of increasing rounding frequency on fall risk scores, allowing for cost-benefit analyses of staffing models (Mitchell et al., 2019).

Second, the large effect size observed (R^2 = .77) suggests that implementing or optimizing hourly rounding protocols could be among the most effective fall prevention strategies available. This is particularly relevant given the continuing challenge of falls in healthcare settings and their substantial financial and human costs. Hester et al. (2016) estimated that a single fall with injury costs a hospital approximately $14,000 in additional care and potential liability, making investment in effective rounding protocols economically justifiable.

Third, the lack of significant relationship between pain scores and other variables suggests that fall prevention strategies should not focus exclusively on pain management. Rather, the comprehensive approach embodied in structured hourly rounding—addressing multiple potential risk factors simultaneously—appears more effective than narrowly targeted interventions (Goldsack et al., 2015).

Fourth, these findings have implications for quality improvement initiatives. Rounding frequency is a relatively straightforward metric to measure, making it valuable for ongoing monitoring and feedback to nursing staff. Hospitals might consider implementing electronic documentation of rounds that could be correlated with fall events and near-misses to strengthen compliance and demonstrate value (Brosey & March, 2015).

Finally, our findings suggest that hourly rounding should be prioritized for all patients, not just those with high Morse Fall Scale scores, as the benefit appears to be consistent across the spectrum of fall risk. This challenges the common practice of implementing intensive fall prevention measures only for high-risk patients (Francis-Coad et al., 2018).

Study Limitations

Several limitations must be acknowledged when interpreting these findings. First, the cross-sectional design of this study precludes establishing causality between hourly rounding and fall risk. While a strong correlation and predictive relationship were observed, longitudinal studies would be necessary to confirm that increasing rounding frequency causes decreased fall risk rather than reflecting some other underlying factor (Meyers et al., 2017).

Second, the sample size (n = 50) limits statistical power and the ability to conduct more complex analyses such as subgroup comparisons or moderation analyses. While adequate for detecting large effects like the rounding-fall risk relationship, this sample size may have been insufficient to detect smaller effects, particularly regarding pain scores (Button et al., 2013).

Third, this study measured hourly rounding as a frequency count but did not assess the quality or content of rounds. Qualitative research by Toole et al. (2016) suggests that the effectiveness of rounding depends not only on frequency but also on whether rounds address key risk factors and patient needs. Our study cannot distinguish between perfunctory checks and comprehensive, purposeful rounds.

Fourth, the Morse Fall Scale, while validated and widely used, captures fall risk at a single point in time. Fall risk can fluctuate throughout a patient's stay, and our analysis may not capture these temporal dynamics (Matarese & Ivziku, 2016). Similarly, pain scores were measured at a single point, potentially missing important fluctuations that might relate differently to fall risk.

Fifth, the study did not control for potentially confounding variables such as medication use (particularly sedatives, hypnotics, and analgesics), staffing levels, unit characteristics, or patient diagnoses. These factors have been shown to influence both fall risk and the effectiveness of prevention strategies (Shaw et al., 2020).

Future Research Directions

Based on the findings and limitations of this study, several directions for future research warrant consideration. First, longitudinal studies with repeated measures of hourly rounding compliance, fall risk scores, and actual fall events would provide stronger evidence regarding causality and the temporal dynamics of these relationships. Such studies could determine whether changes in rounding practices predict subsequent changes in fall risk and events (Titler et al., 2016).

Second, intervention studies that manipulate rounding frequency while controlling for rounding quality would help establish whether the observed relationship is truly dose-dependent. This would have significant implications for optimal rounding protocols and staffing models (LeLaurin & Shorr, 2019).

Third, mixed-methods research incorporating qualitative assessment of rounding practices alongside quantitative measures would provide insight into which components of hourly rounding are most critical for fall prevention. Sims et al. (2018) suggest that patient perceptions of attentiveness may be as important as actual rounding frequency, and this deserves further investigation.

Fourth, research examining the relationship between hourly rounding and pain management more comprehensively—including temporal patterns, medication administration, and patient satisfaction with pain control—might clarify the surprising lack of relationship between pain scores and other variables in this study (Daniels, 2016).

Fifth, studies investigating the cost-effectiveness of different rounding frequencies would provide valuable information for healthcare administrators making staffing and protocol decisions. Such analyses should include both direct costs of falls and indirect benefits such as patient satisfaction and reduced call light usage (Nuckols et al., 2017).

Finally, implementation science approaches could identify barriers and facilitators to maintaining high-fidelity hourly rounding protocols in real-world settings, addressing the common challenge of intervention sustainability in healthcare quality improvement (Tucker et al., 2019).

Conclusion

This study provides compelling evidence of a strong negative relationship between hourly rounding frequency and fall risk as measured by the Morse Fall Scale. The findings suggest that each additional hour of rounding is associated with a significant decrease in fall risk scores, supporting the continued implementation and optimization of hourly rounding protocols in healthcare settings. The lack of significant relationships involving pain scores indicates that the beneficial effects of hourly rounding on fall prevention likely operate through mechanisms other than pain management alone. Despite limitations related to study design and sample size, these findings contribute meaningfully to the evidence base for fall prevention strategies and provide a foundation for future research exploring optimal rounding practices. Healthcare facilities should consider prioritizing consistent hourly rounding as a cornerstone of comprehensive fall prevention programs, potentially yielding substantial benefits in patient safety and quality of care.

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