Evaluation of the Welsh Nursing Care Record (WNCR) in Enhancing & Managing Nursing Workload at Cwm Taf Morgannwg University Health Board (CTMUHB)

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Introduction

The WNCR is a digital application designed to standardize nursing documentation across Wales. It aims to deliver a consistent set of assessments and documents, enhancing safe and effective care for the population of Wales. The WNCR is accessible to ward nurses, specialist nurses, multidisciplinary teams, and other healthcare professionals, allowing them to manage and access relevant information within the system (Digital Health Care Wales (DHCW, 2023).

Background

The WNCR signifies a pivotal shift in nursing documentation in Wales, transitioning from traditional paper records to a comprehensive digital system. This change aims to enhance the efficiency, accuracy, and accessibility of patient information across healthcare settings, particularly focusing on the role of nurses. Prior, to the WNCR's implementation, healthcare in Wales faced challenges with poor nursing documentation, characterized by a lack of standardization, manual auditing, and repetitive recording. Reports such as the Andrews Report (2014) and Flynn Report (2015) highlighted these issues and emphasized the need for improvement. In response, the Welsh Government (WG) introduced policies and strategies such as the Health and Social Care Quality and Engagement Act (WG,2020) and the Welsh Government's 2015 and 2021 digital strategies, aiming to enhance documentation standards and efficiency through digital healthcare solutions (WG, 2021 a & b, 2023 a, b & c).

Context

The WNCR emerges within the context of the Welsh Government's ongoing commitment to digital health initiatives. In 2018, "A Healthier Wales" outlined a comprehensive approach to data-driven, innovative healthcare delivery, with the accompanying National Clinical Framework emphasizing people's well-being across their lifespan. The COVID-19 pandemic further underscored the critical role of digital technologies and data capabilities in modern healthcare, prompting the Minister for Health and Social Services to emphasize the centrality of these elements in the future of the NHS.

Research Question & Objectives

Research Question:
How do nurses' perceptions of the usefulness and ease of the Welsh Nursing Care Record impact their adoption and usage of the system?

To comprehensively answer this question, the study is guided by the following objectives:

- To investigate the impact of the WNCR on nursing staff's cognitive workload, stress levels & job satisfaction.
- To explore the perceptions of usefulness & ease associated with the WNCR among nursing staff, & understand how these perceptions influence system adoption & usage.
- To assess the perceived benefits of the WNCR in enhancing patient care, reducing documentation time, & facilitating better communication among healthcare providers.
- To develop evidence-based recommendations for optimizing the implementation & integration of the WNCR based on the study's findings.

Population of Study

❑ **Focus:**
- Stakeholders within CTMUHB
- All five hospital sites

❑ **Population Sample:**
- **Diverse roles:**
  - Ward/Deputy Managers
  - Registered Nurses (RNs)
  - Healthcare Assistants (HCAs)

❑ **Grade Range:**
- Band 2 to Band 7

❑ **Experience**
- First-hand experience in implementing and integrating the WNCR.
- Documenting care within clinical settings.

❑ **Additional Inclusion:**
- **Student nurses**
  - Broaden perspective.
  - Incorporate various stages of nursing education.
  - Contribute to the utilization of the WNCR within CTMUHB.

Rationale For Study

❑ **Need for Understanding Impact of WNCR:**
- Assess effectiveness and impact on organizations and end-users.
- Context: Digital transformation in healthcare, accelerated by COVID-19 pandemic.

❑ **Importance of Measuring Outcomes:**
- Implementation of digital technologies alone doesn't guarantee improved efficiency and safety.
- Essential to define and measure outcomes to verify expected benefits (Welsh Government, 2018).

❑ **Current Efforts in Wales:**
- Lack of comprehensive and standardized approaches in digital health projects (Loo Gee et al. 2020).
- Global context: Lack of systematic evaluations of digital technologies (World Health Organization, 2016).

❑ **Human Aspect Focus**:
- Unique approach: Emphasis on nurses' experiences as end-users of electronic health records (EHRs) systems.
- Understanding advantages and challenges faced by nurses.

❑ **Gap in Existing Research:**
- Extensive research on EHRs systems, but limited focus on nurses' workload, performance, and job satisfaction.
- Existing studies focus more on medical professionals.

❑ **Role of Nurses in Healthcare**:
- Diverse roles: Patient care, administration, and medical services.
- Need to understand impact of shift from paper-based to digital systems on nurses' work.

❑ **Developing Effective Strategies:**
- Insights crucial for improving implementation and effectiveness of EHR systems.
- Informing ongoing optimization and integration of digital systems in healthcare.

❑ **Contribution to Knowledge**:
- Bridging gap between policy-driven digital health initiatives and actual user experiences.
- Inform future implementation strategies.
- Improve user adoption.
- Enhance patient care through efficient and user-friendly digital healthcare systems.

Ensuring Methodological Rigour in Evaluating the WNCR: A Framework Guided by Literature Review

A comprehensive **Scoping Review** (Caldwell et al., 2011) was conducted to examine the implementation and impact of Electronic Health Records (EHRs) on nursing practices, using the PICO framework (CASP, 2024) as a guiding structure. The review adhered to PRISMA guidelines (Page et al., 2021) and applied the Cochrane Handbook for evidence grading (Ryan & Hill, 2016) to ensure that the selection process was methodologically sound and aligned with the research objectives.

The comprehensive evaluation encompassed a total of **14 studies** *(see reference list for details*). The databases utilized included PubMed, Medline, and University and NHS e-resources, along with the CTMUHB Library and Knowledge Service. The selected studies originated from various geographical regions and employed diverse methodologies, all published between 2020 and 2023.

Thematic analysis (Braun & Clarke, 2022) was employed to analyse the data, beginning with preliminary coding, and progressing to thematic coding. This process led to the identification of three key themes: **Adoption & Implementation, Impact & Perception** and **Usability & Experience**. These themes offered valuable insights into how EHRs influence nursing roles, job satisfaction, patient care, and nurses' overall experiences and perceptions.

To establish a rigorous methodology, a thorough review of the existing literature was conducted, drawing on the expertise of scholars such as Patton (1999), Creswell (2010), Scott (2016), Creswell et al. (2020), Park et al. (2020), and Matta (2022). Their contributions helped shape the approach, best suited to the research question at hand (Carter et al., 2014).

The study adopted a **Mixed-Methods** approach, combining the strengths of both qualitative and quantitative methods. Qualitative interviews are used to capture in-depth insights into nurses' experiences and perceptions, while surveys gather quantitative data to support the findings with statistical evidence. This balanced approach enables a comprehensive examination of the WNCR's impact on nursing practice.

Triangulation - A key feature of this methodology, enhances the validity of the findings by integrating multiple data sources and perspectives (Merriam & Tisdell, 2016). This approach ensures the study adheres to established standards, contributing to credible and robust conclusions (Campbell et al., 2020).

Themes, Data Collection & Methodology

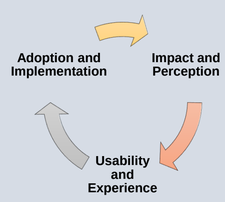
- ❑ An open online survey completed by 46 respondents across CTMUHB sites.
- ❑ Four semi-structured interviews.
- ❑ Mixed methodology captured both qualitative & quantitative data across identified themes (Braun & Clarke, 2022).

Themes	Survey (Quantitative)	Survey (Qualitative)	Interview (Qualitative)
Adoption	X	X	X
Impact	X	X	X
Usability	X	X	X
Human Factors		X	X

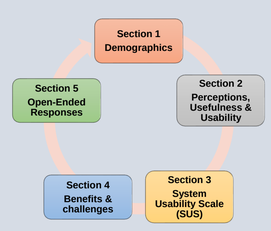
Survey	Interviews
❑ **Recruitment efforts included**: ➢ Email distribution ➢ QR Codes on posters in clinical areas	❑ **Four interviews with defined population**: ➢ 2 Ward Managers ➢ 1 Deputy Manager ➢ 1 Registered Nurse (RN)

Analysis

❑ **Data Analysis Overview**
- Conducted coding and data analysis separately for the two methods.
- Aligned responses and data with three pre-identified themes from thematic codes.

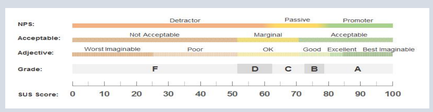


❑ **Statistical Analysis (SPSS & Excel)**
- Utilized descriptive statistics (mean, standard deviation) for comprehensive understanding of Reponses to 33 survey questions across five sections.



- Aimed to uncover general trends and extent of variation in responses.
- Performed cross-tabulations to explore patterns and discrepancies across demographic groups, roles and tenure.
- Examined correlations between responses to reveal associations within the dataset.

❑ **SUS Scoring method**
- Employed SUS scoring (Adapted from Brooke, 1996) to evaluate WNCR usability.
- Used SUS score calculator (Cunningham, 2020) for analysis; scores over 68 considered above average (Sauro, 2011).
- SUS scores converted into grades (A-F) and net promoter scores (NPS) - promoters, passives, detractors to assess system adoption (Bangor et al, 2009; Sauro, 2018).
- Compared SUS scores to other categories for meaningful interpretation (Clark et al. 2021).



(Grades, Adjectives, Acceptability and NPS related to SUS scores)

❑ **SUS Scores Analysis:**
- Input SUS scores into Excel for details analysis.
- Assess distribution and useability of WNCR.
- Analysed SUS scores alongside adjectives and grades to gain insights into user perspectives.

❑ **Thematic Analysis (Braun & Clarke, 2021):**
- Conducted thematic analysis on free text-comments from surveys.
- Followed guidelines by Braun & Clarke (2021) for transcribing, repeated readings, and initial coding.
- Identified and refined themes for accuracy.
- Coded interview responses to highlight insightful quotes and significant themes.

Discussion & Key Findings

This study explored the impact of the Welsh Nursing Care Record (WNCR) on nursing practices, focusing on four key areas: cognitive workload, Job satisfaction, perceptions, ease of use, and benefits for patient care and communication. The WNCR's user-friendly design, with features like search functions and alerts, reduces cognitive strain and improves efficiency, contributing to higher job satisfaction for many. However, challenges such as time-consuming login processes, a hybrid system (paper and digital), and inadequate infrastructure persist. Aligning with existing literature on electronic health records (EHR), training plays a critical role in improving satisfaction and reducing workload. Perceptions of system usefulness strongly drive adoption, with ease of use enhancing workflow integration and patient care. Centralized documentation under the WNCR improves continuity, accuracy, and timely decision-making, while shared care plans strengthen communication. Strategic recommendations include prioritizing user-centred design, comprehensive training, enhanced interoperability, and improved infrastructure, aligning with Welsh Government's digital health strategies to support integrated, efficient, and patient-centred care.

Key Findings - Survey Questions & Interviews

Category	Positive Aspects	Challenges
Cognitive Workload & Job Satisfaction	❑ User-friendly design(search functions, alert systems) reduced cognitive load. ❑ Streamlined documentation process improves job satisfaction. ❑ Frees up cognitive resources for patient care and managerial tasks. ❑ Improved workflow and time management through efficient record access.	➢ Cumbersome log-in processes and slow system loading increase frustration. ➢ Hybrid paper-digital system causes inefficiencies, adding to workload. ➢ Inadequate technological infrastructure (e.g., slow computers, poor internet) exacerbates workload. ➢ Technical issues can cause delays in patient care and frustration during busy shifts.
Perceptions of Usefulness & Ease of Use	❑ Positive views on WNCR's ease of use & usefulness promoted adoption. ❑ Improves documentation efficiency, accessibility, and transferability of information. ❑ Adequate training increases self-efficacy, reducing cognitive burden (Zaman et al., 2021).	➢ Hybrid system leads to potential discrepancies between paper and digital records. ➢ Resistance among older staff due to perceived complexity and usability issues. ➢ Lack of training for other healthcare professionals (doctors, therapists) adds to nurses' workload. ➢ Need for ongoing training sessions on updates and new features to avoid user frustration.
Impact on Patient Care & Communication	❑ Improved continuity & accuracy of patient care through easy access to up-to-date records. ❑ Enhanced interdisciplinary communication and collaboration, improving patient outcomes.	➢ Delays in accessing records due to system slowness can affect patient care delivery. ➢ Hybrid system creates potential gaps in communication when switching between paper and digital formats.

Limitations

Single Health Board Focus	The research was limited to one health board, which restricts how much the findings can be applied to other regions or healthcare systems. The quick rollout of the WNCR might have also limited the opportunity to collect in-depth feedback from users, affecting the detail and relevance of the conclusions. This limitation was inherent to the study's design and scope, with no measures in place to mitigate it.
Limited Engagement from Hospital Sites	Low response rates, especially from community hospital staff such as Registered Nurses at YCC, were a significant limitation. To try and improve engagement, the researcher used QR codes and conducted walk rounds to directly interact with potential participants, explaining the study's value and encouraging their involvement.
Geographical & Technological Engagement from Hospital Sites	The distance between hospital sites created logistical challenges, made more difficult by ongoing system upgrades. To address these issues, the researcher maintained frequent communication via email and made regular visits to the sites to keep in touch with participants and manage the study effectively.
Researcher Experiences	The study was carried out by a single researcher with limited experience in large-scale studies. To compensate, a combination of thematic analysis and statistical tools, namely Microsoft Excel and SPSS, were utilized to ensure the research was conducted rigorously.
Potential Researcher Bias	Given the researcher's involvement in the WNCR training team and their role in designing survey and interview questions, there was a clear risk of bias. To mitigate this, the researcher applied strict thematic analysis procedures to maintain objectivity. The SUS framework also supported the quantitative analysis and helped align it with the study's objectives.
Target Population & Engagement Strategies	The focus on clinical staff who had used the WNCR within the last three months meant the study may not reflect the views of all potential users. Engagement strategies included emails, QR codes, and in-person walk rounds to encourage participation.
Sampling Method & Participant Criteria	The use of convenience sampling meant that participants were chosen based on their availability and willingness to take part rather than being randomly selected. This approach might limit the diversity and representativeness of the sample. Clear criteria were provided to participants before interviews to ensure they were well-informed about the study's aims.

Recommendations

Strategic Recommendations For Implementation	Recommendations For Future Research
Continuous Training & Support: • Implement adaptive training programs tailored to different levels of user expertise and the evolving features of the WNCR. • Establish a robust support mechanism that includes both technical assistance and user guidance to address immediate issues in real-time.	***Longitudinal Analysis:*** • Conducting longitudinal studies to assess the enduring impacts of the WNCR on healthcare outcomes and operational efficiency, which is central to the Welsh Government's strategy of prudent health and value-based healthcare (Welsh Government, 2021b).
Feedback Mechanism: • Develop a structured feedback mechanism to continually collect and analyse user insights. This will facilitate iterative improvements to the system, ensuring it remains responsive to the needs of its users.	***Scalability and Adaptability:*** • Investigating how digital transformations like the WNCR can be adapted across different healthcare settings and geographic regions to determine their scalability and broader applicability. This includes understanding the system's flexibility in different clinical environments and its ability to meet diverse operational demands.

Results

Demographics

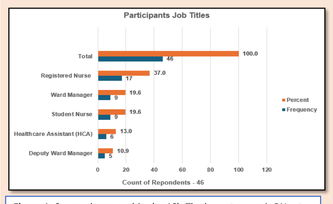


Figure 1: Survey demographics (n=46): The largest group is RNs at 37% . Ward Managers & Student Nurses each account for 19.6%, followed by HCA's at 13% & Deputy Ward Managers at 10.9%.

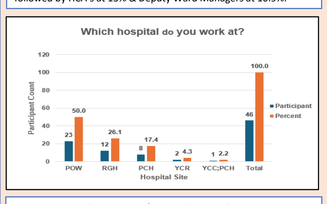
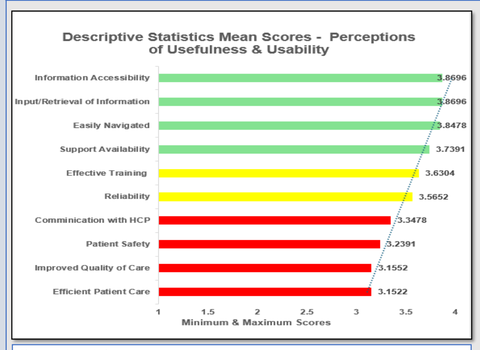


Figure 2: Hospital Sites: 50% of respondents work at POW, 26% at RGH, and 17.4% at PCH, with minimal representation from other sites.

Perceptions, f Usefulness & Usability



Figures 3: Mean Values –
Key Findings:
- **Strengths:** High ratings for information accessibility (mean =3.87) and ease of navigation (mean = 3.85) suggest strong satisfaction in these areas.
- **Areas for Improvement**: Lower ratings for communication with healthcare professionals (mean =3.35) and patient safety (mean=3.24) indicate potential areas for enhancement.
- **Moderate Satisfaction**: Training effectiveness (mean =3.63 and support availability (mean=3.74) show moderate satisfaction
- **Reliability and Efficiency**: Lower ratings in reliable & efficient patient care (mean =3.15) suggest targets for ongoing developments.

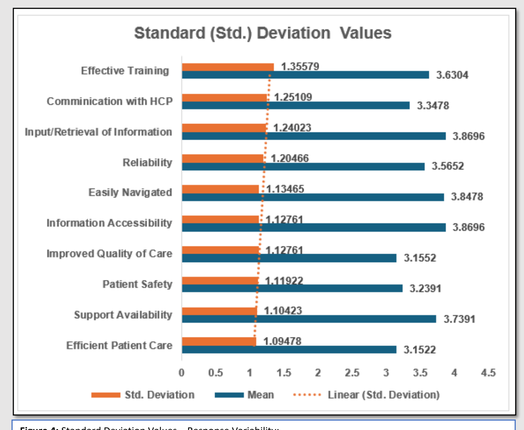


Figure 4: Standard Deviation Values – Response Variability:
- **Training effectiveness** has high variability, reflecting differing views among participants.
- **Patient safety and efficient care** show more consistent opinions, indicating that while they need improvement, participant views on these areas are more aligned.

System Usability Scale (SUS) Analysis

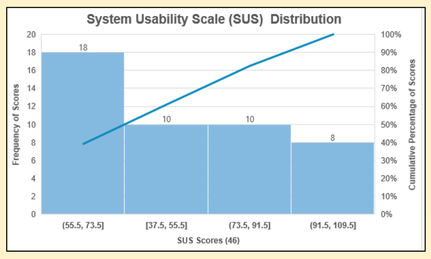


Figure 5: Pareto Chart –
- Shows SUS score distribution across four intervals: 55.5-73.5 holds the majority (90%), indicating moderate to good usability.
- Scores are concentrated in the middle ranges, with 50% evenly split between 37.35-55.5 and 733.5-91.5.
- Only 40% fall in the highest range (91.5-109.5), reflecting consistent usability for most users but some variability at the extremes.

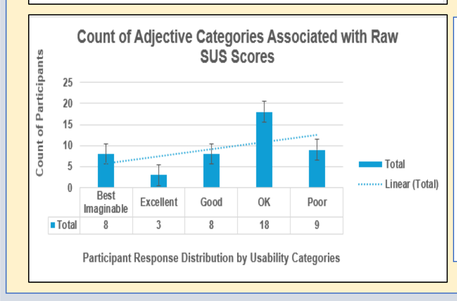


Figure 6: Clustered Colum Chart - Categorizes usability perceptions of participants:
- "Best Imaginable" (8)
- "Excellent" (3)
- "Good" (8)
- "OK" (18)
- "Poor" (9)

Error bars show high variability within categories, highlighting diverse perspectives on usability. This variations offering insights in to user perceptions of usability differ widely among participants' responses with some strongly favouring certain categories, while other express contrasting views.

Benefits & Challenges

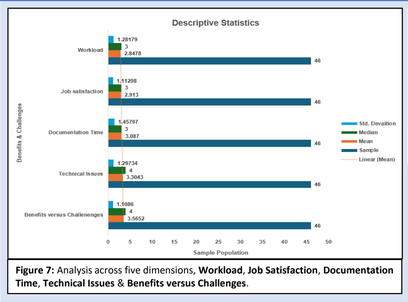


Figure 7: Analysis across five dimensions, **Workload**, **Job Satisfaction**, **Documentation Time**, **Technical Issues** & **Benefits versus Challenges**.

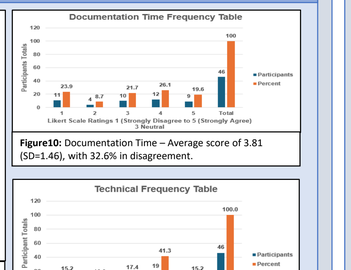


Figure10: Documentation Time – Average score of 3.81 (SD=1.46), with 32.6% in disagreement.

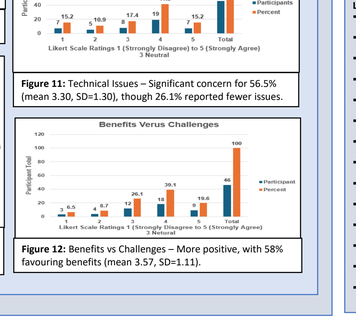


Figure 11: Technical Issues – Significant concern for 56.5% (mean 3.30, SD=1.30), though 26.1% reported fewer issues.

Figure 8: Workload- Mixed perceptions (mean 2.85, SD=1.28) highlighting varied experiences.

Figure 9: Job Satisfaction – Neutral overall (mean 2.91,SD=1.11), with 50% rating neutral.

Figure 12: Benefits vs Challenges – More positive, with 58% favouring benefits (mean 3.57, SD=1.11).

Conclusions

To conclude this evaluation, the WNCR has emerged as a key enabler in the digital transformation of healthcare in Wales, significantly enhancing documentation processes and accessibility. The study shows that positive perceptions and user experiences play critical roles in the successful adoption and effective utilization of the WNCR. However, realizing its full potential requires ongoing refinements and a focus on user-centred design. The main research question of this study centred around whether nurses' attitudes towards the WNCR impact their usage of it. This research confirms that indeed they do, demonstrating that positive perceptions of the WNCR significantly influence its successful adoption and utilization.

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