Informatics in Nursing and Healthcare

NURS: 6401

Walden university

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**Part 1: Literature review Matrix**

**Author(s) last name, First Initial**

Yang, J

Xiao, L

Li, K

**Publication date**

November 2019

**Title of article or chapter Book title Journal title**

“Modeling Clinical experience data as evidence for patient-oriented decision support”

**Database Library URL DOI**

Walden University library, PubMed database, BMC Med Inform Decis Mak. 2020 Jul 9;20(Suppl 3):138. doi: 10.1186/s12911-020-1121-4.

**Keyword search**

Evidence-based practice, Clinical decision support

**Theorist Method Design Population Sample Problem Purpose Research**

Subjective evidence: Similar patient data from social networks were collected and then mapped to Clinical sentiment Ontology (CSO) to build a Patient experience knowledge base (PEKB)

Objective evidence: From Clinical guidelines argumentative guidelines were derived

Both objective and objective data were combined and integrated to plan support architecture.

The purpose of the research was to design and implement a system to show the possibility of decision support architecture that will allow experts and patients to explore different choices by modifying attribute values.

**Summary (What is it about? Analysis strength and weaknesses compared to other studies)**

The article focuses on patient preferences and values as clinical guidelines only focus on 80% of patient situations and the rest must be seen case by case therefore Patient experience and opinions towards health care were considered while considering treatment options. The strength of this article is it is Evidence-based, randomized controlled trial was used, Most literature focuses on improving clinical outcomes via the development of evidence-based CDSSs but this article is leaning more towards patient values and preferences. The weakness is we can miss the evidence-based CDDS because most of the attention is diverted towards patient-centric care in creating a clinical decision support system

**Reference list entry (APA 6th ed)**

Yang, J., Xiaoi, L., & li, K. (2019, November). *Modelling clinical experience data as an evidence for patient-oriented decision support*. BMC medical informatics and decision making. https://pubmed.ncbi.nlm.nih.gov/32646414/

**Author(s) last name, First Initial:**

Hak, F

Guimaraes, T

Santos, M

**Publication date**

2022 Aug 15

**Title of article or chapter Book title Journal title**

Towards effective clinical decision support systems: A systematic review

**Database Library URL DOI**

Walden library database, PubMed, 2022 Aug 15;17(8):e0272846. doi: 10.1371/journal.pone.0272846. eCollection 2022.

**Keyword search**

Clinical decision support system, decision-making, Evidence-based practice

**Theorist Method Design Population Sample Problem Purpose Research**

To conduct the systematic review, Decision Support Systems journal, PubMed, Nature, PlosOne, and AIS e-library were selected as sources of information. from 2000 to 2020 studies were chosen and selected based on eligibility criteria that cover search terms in CDSS, the data is then extracted and managed. To report systematic review PRISMA statements were used. The main purpose of the research is to identify CDSS features and provide a study of its effectiveness.

**Summary (What is it about?, Analysis strengths and weaknesses compared to other studies)**

**CDSs were revised where trend characteristics were identified and based on the findings phases of choice and implementations are underrepresented resulting in gaps in the development of an effective Clinical decision support system.**

Strength: systematic review with meta-analysis

**The weakness is that an evidence-based method was not used which resulted in the development of a not effective clinical decision support system.**

**Reference list entry (APA 6th ed)**

Hak, F., & Guimaraes, T. (2022, August 15). *Towards effective clinical decision support systems: A systematic review*. PloS one. <https://pubmed.ncbi.nlm.nih.gov/35969526/>

**Author(s) last name, First Initial:**

Fry, C

Engel, J

Granger, B

Komada, M

Lovins, J

**Publication date**

2023 May

**Title of article or chapter Book title Journal title**

Evidence-based clinical decision support to improve care for patients hospitalized with acute myocardial infarction.

**Database Library URL DOI**

Walden Library, pubmed database,PMID: 35942719DOI: [10.1097/CIN.0000000000000959](https://doi.org/10.1097/cin.0000000000000959)

**Keyword search**

Evidence-based clinical support for quality care

**Theorist Method Design Population Sample Problem Purpose Research**

A three-month pre and post-intervention was studied. Using IBM Statistics version 26 statistical analysis was performed. To highlight the demographic of the population (Sample) Descriptive statistics was used.

**Summary (What is it about?, Analysis strength and weaknesses compared to other studies)**

The article talks about Left ventricular function and cardiac rehab being part of evidence-based practice guidelines in Myocardial infarction. It showed lower mortality and morbidity following Myocardial infarction and CDSS following evidence-based guidelines has improved the performance in cardiac rehab.

The cardiac rehab referral percentage increased to 98.4% from 80.3% following the implementation of CDSS guidelines that were based on evidence-based guidelines and left ventricular function increased to 100% from 94.2% following CDS implementation which shows the strength of the article.

**Reference list entry (APA 6th ed)**

Corey, F., Jill, E., Brandi, G., Michael, K., & Jon, L. (2023, May 1). *Evidence-based clinical decision support to improve care for patients hospitalized with acute myocardial infarction*. Computers, informatics, nursing : CIN.

<https://pubmed.ncbi.nlm.nih.gov/35942719/>

**Author(s) last name, First Initial:**

Blecker, S

Gannon, M

Leon, De Samantha

Shelley, D

Wu, Y Winfred

Tabaei, B

Magno, J

Singer, H

**Publication date**

June 2023

**Title of article or chapter Book title Journal title**

**“Practice facilitation for scale-up of clinical decision support for hypertension management: study protocol for a cluster randomized control trial”**

**Database Library URL DOI**

Walden Library, Science Direct database,<https://doi.org/10.1016/j.cct.2023.107177>

**Keyword search**

Clinical decision support, Clinical trials.

**Theorist Method Design Population Sample Problem Purpose Research**

A randomized controlled trial was used to compare CDS effect itself and CDS combined with CDS plus on Blood pressure control in small independent primary care practices in New York City. 46 primary care practices with the same Electronic health record were randomized, Hypertensive patients seen in those practices were included in the evaluation.

**Summary (What is it about?, Analysis of strengths and weaknesses compared to other studies)**

When it comes to BP management, only half of patients control their Blood pressure. Strategies such as scaling CDS can help with controlling blood pressure mainly in primary care practices. This article evaluates whether hypertension-focused CDS can help with Blood pressure management in primary care practices. The strength is it focuses on small primary care practices because it must be started from the primary level to achieve the global outcome

**Reference list entry (APA 6th ed)**

Blecker, S., Gannon, M., Leon, S., Shelley, D., Yu, W., Tabaei, B., Magno, J., & Singer, H. (2023, June). *Practice facilitation for scale up of clinical decision support for Hypertension Management: Study Protocol for a cluster randomized control trial*. Contemporary Clinical Trials. https://www.sciencedirect.com/science/article/pii/S1551714423001003

**Part 2: Clinical Decision Support (CDS) Recommendation**

**Introduction:**

This PowerPoint presentation presents findings from the research submitted under part one and data to support Clinical decisions support for quality improvement. Along with the pros of CDS we also present some potential harms that come with this amazing tool.

**Findings from four articles**

The four articles presented were successful in portraying an evidence-based Clinical Decision Support system as a tool to improve healthcare delivery. Patient experience used as evidence in clinical decision support systems has shown to be effective in making clinical decisions. There were some gaps in the development of an effective Clinical decision support system and that was because of the exclusion of evidence-based ideas. Effective CDS for design and implementation is always sustained by evidence-based principles. Guidance on CDS is provided by the “Five Rights” and Guide checklist which are evidence-based innovations to design CDS for the improvement of population health. The REAIM framework that has outcome measures is most relevant in real work implementation along with the translation of evidence-based research findings into practice.

We use CDS tools in our unit all the time, some of them include order sets for stroke patients and they have different Orde sets for different types of strokes with recommendations. We also have databases that provide us with information that is relevant to patients and alerts us about potentially dangerous situations. This has helped with quality improvement in my workplace because we are a level one stroke center and we get stroke patient all the time as we all know “TIME IS BRAIN” Every second is crucial, therefore these CDS tools helps us save time and provide quality care as the orders set, recommendations that we included in the order sets are evidence-based.

**CDS Recommendation**

I would always recommend CDS in clinical decision-making. According to Demigos.com, A study shows that from $1.2 billion in 2020, the global CDSS market to expand to 1.8 billion by 2025. CDS creates a real, tangible value for both patients and providers. The idea behind implementing CDS is It can be overwhelming for the providers to deal with the amount of data and knowledge every day and CDS can offer support to find, process, and deliver information quickly at the right time. CDS can enhance the diagnostic process, prevent medical errors, and improve quality care. We do a lot of scans on our unit and sometimes we have to do it because we don’t have any other way to find out what is going on with the patient and this can lead to exposure to a lot of radiation mainly via CT scans and can be costly to patients. In this case, CDS can be a lifesaver as it helps compare a patient's symptoms with a database of previous cases and we can apply the same principle to other expensive tests. This way the hospitals also don’t have to pay extra hours for some pointless jobs. 75 % of medical errors that occur in medical facilities are caused by distraction. (*How to implement a clinical decision support system* 2021) This can be prevented by generating alerts at the right time and automating the order process.

**Alert Fatigue**

CDS helps clinical personnel in decision-making via alerts but sometimes this high volume of alerts from every direction can result in fatigue among clinical personnel. Alert Fatigue can be time-consuming, can take a lot of mental energy, and can make clinicians less responsive to crucial alerts resulting in medication errors**.**

**Avoiding alert Fatigue:**

Setting alerts according to severity/alert priority and customizing alerts to notify healthcare providers in a certain way so that they can differentiate between different alert types can help with alert fatigue. Making sure the hospital has sufficient on-call workers that way not too many alerts will fall on one person. Shifting alerts such as time-depending drug interaction alerts to other medical staff such as pharmacists and nurses can help providers with alert Fatigue. (Wan1 et al., 2020) Alerts frequently overridden can be revised if not important so that the system can be updated to decrease alert fatigue.

**Overriding an alert**

Overriding alert is appropriate if the reasons reported by the providers are acceptable according to their study’s framework and if it is verified based on the review of relevant guidelines. For instance, if there is a dose alert displayed after a drug was prescribed, the reason for override can be “will adjust the dose”, “will monitor as recommended”, or “Patient had previously tolerated”. Afterward, this will be checked by a multidisciplinary group and verified in the chart review. (Poly et al., 2020)

**Monitor compliance**

Compliance can be monitored through policy reviews, compliance management software, and audits.

**Factors that contribute to continuous override**

The factor for the continuous override is when the provider override saying “will monitor as recommended “and orders the medication, saying that he/she will monitor for adverse reaction, then when it comes to Nursing she has to override again saying “will notify the provider” resulting in continuous override. I think in this case override is necessary as it alerts us that we need to watch for any reaction after administering the medications.

**Conclusion**

**The clinical decision support system based on evidence-based principles is a game changer in today's health care. It has played a significant role from enhancing patient safety by reducing medication errors to providing quality care via appropriate and timely clinical management reducing costs and workflow improvement. Despite all the benefits CDSS also comes with potential harm such as Alert fatigue, therefore continuous research is essential to optimize alert frequencies and types to increase clinical outcomes. Reevaluation of override rates should be done for reduction after implementation is done to decrease alert fatigue.**

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**References:**

*How to implement a clinical decision support system*. Demigos. (2021a, August 26).

<https://demigos.com/blog-post/clinical-decision-support-system/>

Poly, T. N., Islam, M. M., Yang, H.-C., & Li, Y.-C. J. (2020, July 20). *Appropriateness of overridden alerts in Computerized Physician Order Entry: Systematic Review*. JMIR medical informatics.

<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7400042/>

Wan1, P. K., Satybaldy2, A., Huang1, L., Holtskog3, H., & Nowostawski2, M. (2020, October). *Reducing alert fatigue by sharing low-level alerts with patients and enhancing collaborative decision making using blockchain technology: Scoping Review and proposed framework (MedAlert)*. Journal of Medical Internet Research.

<https://www.jmir.org/2020/10/e22013/>