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Grace Peterson Nursing Research Colloquium

2019

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Nov 14th, 9:30 AM - Nov 17th, 12:00 PM

## **Application and Influence of Technology on Medication Adherence in Adults with Heart Failure: An Integrative Literature Review**

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Loda, Kristen, "Application and Influence of Technology on Medication Adherence in Adults with Heart Failure: An Integrative Literature Review" (2018). *Grace Peterson Nursing Research Colloquium*. 32. <https://via.library.depaul.edu/nursing-colloquium/2018/autumn/32>

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# Application and Influence of Technology on Medication Adherence in Adults With Heart Failure

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## BACKGROUND & SIGNIFICANCE

As of 2014, over 6 million Americans are diagnosed with heart failure

- No cure → requires symptom management and prevention through polypharmacy
- The average number of reported medications per patient is 6.4
- Drug regimen nonadherence can lead to frequent hospitalizations and ER visits, poor quality of life, and mortality
- Technology can provide patients with remote ways to provide efficient self-monitoring, education, assistance, and motivation to manage their disease outside of the hospital setting

*Patients need improved medication management*

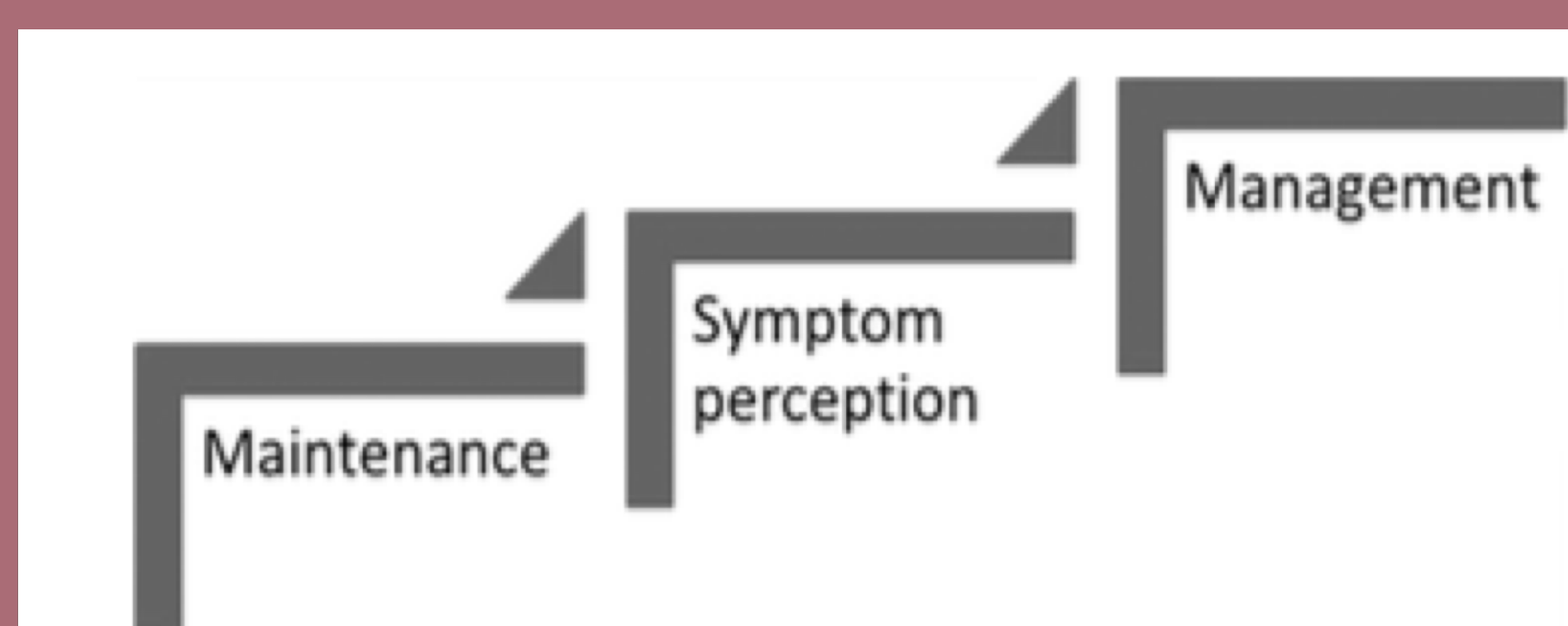


## CONCEPTUAL THEORY

### The Situation Specific Theory of Heart Failure Self-Care

Self care is "a naturalistic decision-making process that influences actions that maintain physiological stability, facilitate the perception of symptoms, and direct the management of those symptoms"

Maintenance, symptom perception, and management are components of a sequential yet continuous process throughout the treatment of heart failure. The components are guided by autonomous and consultative decision-making.



## PURPOSE & RESEARCH QUESTIONS

**Purpose:** Identify and describe technology available to help adults with heart failure better adhere to their prescribed medication regimens.

### Research Questions:

1. *What technology is available to facilitate medication adherence in adults with heart failure?*
2. *What evidence exists to support efficacy of medication adherence when these technologies are used?*

## METHODS & RESULTS

An integrative literature review was conducted to include most recent, peer-reviewed, and primary sources. Seven articles were selected that met certain inclusion and exclusion criteria. Eight different forms of technology were explored and used as interventions to measure efficacy of medication adherence in adults with heart failure.

TECHNOLOGY	TYPE	EFFICACY
MyMedSchedule application	reminder system	NO
electronic pillbox (telehealth)	reminder system	NO
smartphone application (mHealth)	reminder system	NO
Penn State Heart Assistant application	event monitoring system	YES
MedSentry device	reminder system	NO
Medication Adherence Support System (MASS) device	event monitoring system	TBD
Medication Event Monitoring System (MEMS)	event monitoring system	YES
Telehomecare	video phone system	NO

## DISCUSSION

Event monitoring systems such as the Penn State Heart Assistant and the MEMS device have been found to be the most effective in improving medication adherence.

This form of technology holds patients accountable through a second party and creates a bidirectional approach to medication adherence. Feedback at clinical follow-up visits incorporates the use of behavior theory-based interventions and should be further explored.

Reminder systems were not proven to be effective but are still a feasible form of technology to promote medication adherence. Technology should be further developed and studied to include behavior theory-based feedback with the use of a reminder system.

Long term use of a video phone system with at-home equipment does not appear to be efficient or realistic in improving medication adherence.

## NURSING IMPLICATIONS

Nurses have a unique perception of the heart failure disease process and contribute to overall wellness, disease prevention, and management

Nurses are present throughout medical diagnosis, treatment and management, and mortality, as well as the emotional and psychological process.

Education is a key nurse role. Nurses should educate their patients on available technologies to promote medication adherence and symptoms management.

## CONCLUSION

These findings reveal the need for further study in efficacy of event monitoring systems through use of smartphone applications and devices. Further studies should be conducted to manipulate behavior theory-based interventions with use of technology to determine if this is a limiting factor in improving medication adherence.

More research must be done with larger sample sizes and should also address potential barriers to adhering to medication regimens.