



HHS Public Access

Author manuscript

Public Health Nurs. Author manuscript; available in PMC 2021 November 01.

Published in final edited form as:

Public Health Nurs. 2020 November ; 37(6): 895–899. doi:10.1111/phn.12795.

Using behavioral science theory to enhance public health nursing

David A. Sleet, PhD, Consultant¹, Ann M. Dellinger, PhD, MPH, Chief²

¹The Bizzell Group/TJFACT/Veritas Management, LLC and the Division of Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA

²Division of Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA

Abstract

The application of behavioral science theory is instrumental in advancing nursing research and practice. Nurses can benefit from a thorough understanding of theoretical perspectives related to health behavior change. Behavioral science theory can provide a conceptual context for understanding patient behavior, it can guide research on the determinants of health behavior and health service delivery, and it can offer alternative approaches to nursing practice that may improve the effectiveness of patient care. The aim of this paper is to provide some examples of behavioral theories that can be used in nursing research and practice, and provide an example of how one theory, Stages of Change (Transtheoretical Model), can be applied to older adult fall prevention. Given the critical role behavior plays in premature morbidity and mortality, public health nurses and researchers can benefit by broadening the use of theory in the design and implementation of interventions, using behavioral theory as their guide.

Keywords

behavior; injury; older adult falls; stages of change; theory

1 | INTRODUCTION

Developing research capacity and competency as part of nursing education is critical for the development of effective public health nursing interventions and practices. Nursing research

Correspondence: David A. Sleet, The Division of Injury Prevention, National Center for Injury Prevention and Control, Centers for Disease Control and Prevention (CDC), Atlanta, GA, USA. davidasleet@gmail.com.

AUTHOR CONTRIBUTIONS

DS developed the concept and involved in critical revisions for important intellectual content; DS and AD involved in manuscript writing.

CONFLICT OF INTEREST

None declared. Dr. Sleet previously served as the Associate Director for Science in the Division of Injury Prevention at the National Center for Injury Prevention and Control at the CDC.

DISCLAIMER

The findings and conclusions in this paper are those of the authors and do not necessarily represent any official position of the Centers for Disease Control and Prevention.

helps improve health outcomes for patients, both by bringing new ideas to the field through research discoveries and by improving the translation of knowledge that can benefit evidence-based practices (Thompson & Barcott, 2019). The application of behavioral theory is instrumental in this regard.

We distinguish between “nursing theory” and “behavioral theory” in that the former primarily focuses on patient care while the latter focuses on patient behavior change. Both are important, however, and we focus here on behavioral theory.

Public health, in general, has been rather slow to embrace behavioral theory as a foundational element in improving research and public health practice (Hayden, 2019; Simons-Morton, McLeroy, & Wendel, 2012). Ryan (2009, p. 164) claimed that “... although there is a general understanding of health promotion, nurses struggle with understanding theoretical perspectives related to health behavior change, best approaches, and evaluation of outcomes...”. Yet, more modern nursing research has clearly advanced since then by developing and implementing studies using well-accepted behavioral theories such as the Integrated Behavioral Model (Fishbein et al., 2001; Ho et al., 2019) and processes used to guide theoretically based nursing care and research (Weber, 2019; Olsen, Baisch, & Monsen, 2017).

2 | USING THEORY TO ADVANCE PUBLIC HEALTH NURSING

Public health nursing is defined as “the practice of promoting and protecting the health of populations using knowledge from nursing, social, and public health sciences” (American Public Health Association, 2013). Public health nursing focuses on population health, with the goal of promoting health and preventing disease, injury, and disability. Both research and nursing practices are improved by the development and application of sound behavioral theory, including theory that helps encourage and maintain behavior change (Kwasnicka, Dombrowski, White, & Sniehotta, 2016). Behavioral theory is relevant to a wide variety of topics addressed by nurses including efforts to help people stop smoking, lose weight, prevent injuries, control alcohol consumption, and to reduce workplace or family stress, among others (Simons-Morton et al., 2012).

In the 2018 revision of the 2011 Quad Council Coalition Competencies for Public Health Nursing (Campbell, Harmon, Joyce, & Little, 2020), Domain 6 (Public Health Science Skills) describes competencies for Tier 3 (Senior Management/Executive Level) that include “develop new approaches to theory-guided and evidence-based practice in public health” (6C6b); and “evaluate theory-guided and evidence-based practice in public health” (6C6c). This clearly sets expectancies for competency in the use of theory-based approaches that can improve the effectiveness of a nurse’s efforts to improve patient and community health.

Theory-based behavioral interventions that drive these improvements in health may not only change behavior, but may also change environments in ways that predispose and reinforce healthier habits (Sleet, Ballesteros, & Baldwin, 2013). The use of behavioral theory can improve and accelerate change. Behavioral theory helps unify and codify knowledge and can guide the search for why people adopt, do not adopt, or abandon healthy lifestyles.

Behavioral theory helps organize information into patterns that can be used to predict and therefore to prevent disease and injury. For these reasons, public health nursing efforts using behavioral theory are more likely to succeed than those developed without it.

In implementing community-wide public health programs in high-risk communities, the temptation is to communicate facts, teach about the need for behavior change, and emphasize changes that will lead to improvements in health and reductions in disease and injury. On the surface, this is a sensible approach; however, education alone is often not enough to change behavior. The underlying assumption is that when individuals are provided sound advice, they will act on the advice, making behavior changes that will improve their health. But it is not that straightforward. The application of health behavior change theory to practice requires a focus on integrative models that examine the interplay of individual, interpersonal, social, cultural, and environmental factors (Short & Molburn, 2015; U.S. Department of Health & Human Services, 2020).

While it may be prudent to inform people about the dangers of smoking, obesity, lack of exercise, or not using a seat belt, there are other social, ecological, and individual factors that should be considered in bringing about change. To be effective, interventions should consider people's motives, the culture they live in, their lifestyle, and their specific needs in an ecological context (Davis, Campbell, Hildon, Hobbs, & Michie, 2015; Gielen, Sleet, & DiClemente, 2006). For example, to reduce drinking and driving, policies that increase enforcement, reduce blood alcohol levels, reduce alcohol-outlet-density, or change social norms around drinking and driving may be the most effective approaches to producing widespread public health impact (National Academies of Science, Engineering and Medicine, 2018): that's where theory can play a role. Theory can help us to understand social and behavioral determinants and can uncover underlying principles about how people change their alcohol behaviors and how changing drinking environments, both physical and social, play an important role in the process (Michielsen, Chersich, Temmerman, Dooms, & Van Rossem, 2012; Rejeski & Fanning, 2019). Increasing attention is being placed on taking a multilevel ecological approach to improving public health, realizing that individual behavior occurs within a social/environmental context (Mack, Liller, Baldwin, & Sleet, 2015; Olsen et al., 2017). Health behaviors are the product of individual, interpersonal, community, societal, and cultural influences, and behavior change must be viewed within this broader context (Allegrante, Hanson, Sleet, & Marks, 2010). It is important to consider these influences when planning and implementing public health programs administered or guided by nurses that are designed to change lifestyle behaviors and environments.

In contrast to individual behavior change efforts, environmental change such as those imbedded in "built environment" or "active living" movements and structural changes such as those that protect employees in the workplace may be capable of changing the behavior of many people all at once (Wilkie, Townshend, Thompson, & Ling, 2018). For example, city planners can design public spaces with walking and biking trails to encourage more physical activity. Regulators can implement policies that have the potential to reduce exposure to environmental hazards like tobacco smoke. Employers can institute and enforce health and safety regulations to protect workers. These are examples of opportunities where applying individual behavior change theories can change the behavior of community gatekeepers and

decision-makers, who in turn, can take actions to improve physical and social environments that will improve everyone's health (Kahan et al., 2014). The public health nurse can play an important role here by guiding these efforts with informed strategies, and by supporting social-ecological change at the community and organizational level. They can also advocate for the use of theory to help clarify assumptions on which interventions are selected in these settings.

It is important to recognize, however, that environmental and structural change to protect health, for example in injury prevention, will not likely succeed without some individual behavioral adaptation (Sleet & Gielen, 2015): motor vehicle drivers must obey the speed limit; homeowners must change the batteries in smoke alarms; community members must use the walking or biking trails built by the city; health providers must be willing and able to use prescription drug monitoring programs in their state to improve prescribing practices and reduce opioid overdose deaths.

The nursing literature includes examples of developing new theories, modifying existing ones, and tailoring applications to new and emerging health problems in nursing research (Alligood, 2017). Behavioral theories and models are being applied to community health nursing with increasing frequency—theories such the Theory of Planned Behavior, Social-Cognitive Theory, Social Learning/Cognitive Theory, and Theory of Reasoned Action. Other models, such as the Social-Ecological Model, the PRECEDE/PROCEED model, the Social Capital Model, the Transtheoretical Model (Stages of Change), the Health Belief Model, and Pender's Health Promotion Model, among others, have potential for wider application in nursing research and practice. Many of these models and theories can be used when developing public health interventions designed to change behavior and are explained in more detail in the text by Murdaugh, Parsons, and Pender (2019) and Hilliard, Riekert, and Ockene, (2018). Middle range (nursing) theories ready for application to nursing practices are described by Smith and Liehr (2018) and Smith (2020).

One can use behavioral theory in a deliberate manner to achieve very specific results as illustrated by Michielsen et al. (2012) in HIV prevention; Prochaska (2011) in smoking cessation; and Gielen, Sleet, and Parker (2014) in injury prevention. The emphasis on intervention planning that is "theory based" and occurs at multiple levels is a welcomed affirmation of applying contemporary health promotion approaches in nursing practice (Davis et al., 2015; Glanz & Bishop, 2010).

As an illustration, we provide a real-world example of one of the theories (Transtheoretical Model [TTM] or Stages of Change), applied to the area of older adult fall prevention. Falls are a threat to the health of older adults and can reduce their ability to remain independent. Older adult falls (principally among those 65 years and older) resulted in 3.2 million emergency department visits, more than 900,000 hospitalizations, and more than 29,000 deaths in 2016 (Centers for Disease Control & Prevention, 2019). Nurses play an important role in reducing patients' fall risk and many nurse-enabled fall prevention approaches have been used with success in community and health care settings (Leahy-Warren et al., 2018).

In response to the need to prevent falls and fall-related injuries in older adults, the Centers for Disease Control and Prevention (CDC) has developed the Stopping Elderly Accidents, Deaths, and Injuries (STEADI) initiative to guide nurses and other health care providers in (a) screening older adults for fall risk, (b) assessing modifiable risk factors, and (c) intervening to reduce risk by using effective clinical and community strategies. Included in the STEADI materials is a CDC pocket guide for health care providers that uses the Stages of Change model to help tailor fall prevention messages for patients based on their readiness to change (Haddad, Bergen, & Luo, 2018). The model recognizes that patients will be at different stages of readiness for change: from the precontemplation stage (patient has not thought about the issue), to contemplation (the patient has thought about falling and what might be done to prevent a fall), to preparation (the patient is ready to make behavioral changes to prevent a fall), to the action stage (patient has changed some behaviors within the past 6 months that would reduce the risk of falling). Tailoring messages to fit the patient's stage of change will garner the most effective response.

For example, a patient in the precontemplation stage may not attend to a message from a nurse or other health care provider about reviewing their medications because they do not see themselves at risk for a fall. Alternatively, a patient who asks about fall prevention strategies they can implement, would be in the preparation stage and ready for change. Those who have already taken some steps to prevent falls but need more encouragement would be in the action stage. Table 1 shows the advice provided in the STEADI pocket guide for talking with patients about falls using the Stages of Change Model. The pocket guide and other provider resources for nurses from the STEADI initiative can be found at <https://www.cdc.gov/steady/index.html>

With the illustration provided in Table 1, counseling patients about preventing older adult falls can be improved using the Stages of Change Model (TTM). The technique focuses on identifying where a patient is on the spectrum of stages of change and tailoring specific actions to match patient's stage such as increasing awareness, building knowledge, providing motivation, building confidence, eliciting commitment, and providing resources that can further stimulate patient action toward meaningful behavior change (Prochaska & Prochaska, 2016).

In conclusion, the use of behavioral theory in public health nursing can be an important tool for effective research and practice, and contribute in important ways to improving research capacity in nursing (Chen, Sun, Tang, & Castro, 2019). It can provide a conceptual context for understanding patient behavior; it can guide research on the determinants of health behavior and health service delivery; and it can offer alternative approaches to nursing practice that may improve the effectiveness of patient care. Given the enormous role behavior plays in premature morbidity and mortality, public health nurse practitioners and researchers can benefit by broadening the use of theory in the design and implementation of interventions for individuals and the public, using behavioral change theories as their guide.

ACKNOWLEDGMENTS

The authors thank Ruth Shults, PhD, MPH, BSN and Janice A. Mark, DNP, FNP-BC, RN for their helpful review and comments on various drafts of this paper.

REFERENCES

- Allegrante JC, Hanson D, Sleet DA, & Marks R (2010). Ecological approaches to the prevention of unintentional injuries. *Italian Journal of Public Health*, 7(2), 24–31.
- Alligood MR (2017). *Nursing theorists and their work*, 9th ed. Elsevier.
- American Public Health Association. (2013). The definition of public health nursing. A statement of the APHA Public Health Nursing Section. http://www.achne.org/files/public/Draft2013PHNDefinitionByAPHA_PHNSection.pdf
- Campbell LA, Harmon MJ, Joyce BL, & Little SH (2020). Quad council coalition community/public health nursing competencies: Building consensus through collaboration. *Public Health Nursing*, 37, 96–112. 10.1111/phn.12666.n [PubMed: 31589001]
- Centers for Disease Control and Prevention. (2019). Welcome to WISQARS™. <https://www.cdc.gov/injury/wisqars/index.html>
- Chen Q, Sun M, Tang S, & Castro AR (2019). Research capacity in nursing: A concept analysis based on a scoping review. *British Medical Journal Open*, 9(11), e032356 10.1136/bmjopen-2019-032356
- Davis R, Campbell R, Hildon Z, Hobbs L, & Michie S (2015). Theories of behavior and behavior change across the social and behavioral sciences: A scoping review. *Health Psychology Review*, 9(3), 323–344. 10.1080/17437199.2014.941722 [PubMed: 25104107]
- Fishbein M, Triandis HC, Kanfer FH, Becker M, Middlestadt SE, & Eichlen A (2001). Factors influencing behavior and behavior change In Baum A, Tevenson TA, & Singer JE (Eds.), *Handbook of health psychology* (pp. 3–17). Lawrence Erlbaum.
- Gielen AC, Sleet DA, & DiClemente R (Eds.) (2006). *Injury and violence prevention: behavioral science theories, methods and applications* Jossey Bass.
- Gielen AC, Sleet DA, & Parker E (2014). Health Behavior Change in Populations In Kahan S, Gielen AC, Fagan PJ, & Green LW (Eds.), *Unintentional injury and behavior change* (pp. 294–314). Johns Hopkins University Press.
- Glanz K, & Bishop DB (2010). The role of behavioral science theory in development and implementation of public health interventions. *Annual Review of Public Health*, 31, 399–418. 10.1146/annurev.publhealth.012809.103604
- Haddad YK, Bergen G, & Luo F (2018). Reducing fall risk in older adults. *The American Journal of Nursing*, 118(7), 21–22. 10.1097/01.NAJ.0000541429.36218.2d
- Hayden J (2019). *Introduction to health behavior theory*, 3rd ed. Jones & Bartlett Learning.
- Hilliard ME, Riekert KA, & Ockene KA (2018). *The handbook of health behavior change*, 5th ed. Springer.
- Ho MH, Chang HC, Lin YK, Traynor V, Hung-Huey Tsai HH, Buckwalter K, ... Chang CC (2019). Application of the integrated behavioral model to oral self-care behavior of community-dwelling middle-aged and older people in Taiwan. *Public Health Nursing*, 36, 726–734. 10.1111/phn.12646 [PubMed: 31348558]
- Kahan S, Gielen AC, Fagan PJ, & Green LW (Eds.) (2014). *Health behavior change in populations* (pp. 294–314). Johns Hopkins University Press.
- Kwasnicka D, Dombrowski SU, White M, & Sniehotta F (2016). Theoretical explanations for maintenance of behavior change: A systematic review of behavior theories. *Health Psychology Review*, 10(3), 277–296. 10.1080/17437199.2016.1151372 [PubMed: 26854092]
- Leahy-Warren P, Day MR, Philpott L, Glavin K, Gjevjon ER, Steffenak AKM, ... Mulcahy H (2018). A falls case summary: Application of the public health nursing intervention wheel. *Public Health Nursing*, 35, 307–316. 10.1111/phn.12408 [PubMed: 29676488]
- Mack K, Liller KD, Baldwin GT, & Sleet DA (2015). Preventing unintentional injuries in the home using the Health Impact Pyramid. *Health Education and Behavior*, 42(1S), 115S–122S. 10.1177/1090198114568306 [PubMed: 25829110]
- Michielsen K, Chersich M, Temmerman M, Dooms T, & Van Rossem R (2012). Nothing as practical as a good theory? The theoretical basis of HIV prevention interventions for young people in Sub-Saharan Africa: A systematic review. *AIDS Research and Treatment*, 2012, Article 345327, 1–18. 10.1155/2012/345327

- Murdaugh CL, Parsons MA, & Pender NJ (2019). *Health promotion in nursing practice*, 8th edn Pearson Education Inc.
- National Academies of Sciences, Engineering and Medicine. (2018). *Getting to zero alcohol-impaired driving fatalities* National Academies Press.
- Olsen JM, Baisch MJ, & Monsen KA (2017). Interpretation of ecological theory for physical activity with the Omaha System. *Public Health Nursing*, 34(1), 59–68. 10.1111/phn.12277 [PubMed: 27346458]
- Prochaska JO (2011). What do we know about unplanned quit attempts? Practically nothing or nothing practical? *Addiction*, 106(11), 2014–2015. 10.1111/j.1360-0443.2011.03555.x [PubMed: 21978312]
- Prochaska JO, & Prochaska JM (2016). *Changing to thrive: Using the stages of change to overcome the top threats to your health and happiness* Hazelden.
- Rejeski WJ, & Fanning J (2019). Models and theories of health behavior and clinical interventions in aging: A contemporary, integrative approach. *Clinical Interventions in Aging*, 14, 1007–1019. 10.2147/CIA.S206974 [PubMed: 31213787]
- Ryan P (2009). Integrated theory of health behavior change: Background and intervention development. *Clinical Nurse Specialist*, 23(3), 161–172. 10.1097/NUR.0b013e3181a42373 [PubMed: 19395894]
- Short SE, & Molburn S (2015). Social determinants and health behaviors: Conceptual frames and empirical advances. *Current Opinions in Psychology*, 5, 78–84. 10.1016/j.copsyc.2015.05.002
- Simons-Morton BG, McLeroy KR, & Wendel ML (2012). *Behavior theory in health promotion practice and research* Jones & Bartlett Learning.
- Sleet DA, Ballesteros M, & Baldwin G (2013). Injuries and lifestyle medicine In Rippe J (Ed.), *Textbook of lifestyle medicine* (2nd ed., pp. 1447–1456). CRC Press.
- Sleet DA, & Gielen AC (2015). Application of behavior change theory to preventing unintentional injuries In Kaplan RM, Spittel ML, & David DH (Eds.), *Population health: behavioral and social science insights*. AHRQ Monograph No.15–0002. Office of Behavioral and Social Science, National Institutes of Health.
- Smith M (2020). *Nursing theories and nursing practice* (5th ed.). F.A. Davis.
- Smith MJ, & Liehr P (Eds.) (2018). *Middle range theory for nursing* (4th ed.). Springer.
- Thompson MR, & Barcott DS (2019). The role of the nurse scientist as a knowledge broker. *Journal of Nursing Scholarship*, 51(1), 26–39. 10.1111/jnu.12439 [PubMed: 30354032]
- U.S. Department of Health and Human Services. (2020). *Healthy people 2020 framework*. <https://www.healthypeople.gov/sites/default/files/HP2020Framework.pdf>
- Weber JJ (2019). A systematic review of nurse-led interventions with populations experiencing homelessness. *Public Health Nursing*, 36(1), 96–106. 10.1111/phn.12552 [PubMed: 30353565]
- Wilkie S, Townshend T, Thompson E, & Ling J (2018). Restructuring the built environment to change adult health behaviors: A scoping review integrated with behavior change frameworks. *Cities & Health*, 2(2), 198–211. 10.1080/23748834.2019.1574954 [PubMed: 31650034]

Application of the stages of change model (TTM) in a conversation with older adults about fall prevention, based on the patient's stage of change

TABLE 1

If you hear this from a patient:	A Health Care Provider can respond with:
Precontemplation stage	As we age, falls are more likely for many reasons, including changes in our balance, vision, and how we walk
Falling is just a matter of bad luck	Preventing falls can prevent broken hips and help you stay independent longer
Contemplation stage	Let us look at some factors that may make you likely to fall and talk about what you could do about one or two of them
My friend down the street fell and ended up in a nursing home	I am going to refer you to a specialist who can help you improve your vision, balance, and optimize your medications
Preparation stage	
I am worried about falling. Do you think there is anything I can do to keep from falling?	
Action stage	
I am taking some steps to prevent a fall. What else can I do to keep from falling and stay independent?	

Source: U.S. Centers for Disease Control and Prevention (STEADI brochure) at <https://www.cdc.gov/steadi/pdf/STEADI-FactSheet-TalkingWPatients-508.pdf>