Universiteit
Leiden
The Netherlands

Embracing a new beginning: understanding the teachable window for lifestyle change

Brust, M.

Citation
Brust, M. (2024, September 19). *Embracing a new beginning: understanding the teachable window for lifestyle change*. Retrieved from https://hdl.handle.net/1887/4092618

Version:	Publisher's Version
License:	Licence agreement concerning inclusion of doctoral thesis in the Institutional Repository of the University of Leiden
Downloaded from:	https://hdl.handle.net/1887/4092618

Note: To cite this publication please use the final published version (if applicable).

1

General introduction

Adapted from Nederlands Tijdschrift voor Geneeskunde. 2020;164:D4835

CASE

A 58-year-old patient experienced his first myocardial infarction after years of fatigue, repeated high blood pressure readings, and significantly elevated lipid levels. Despite multiple warnings from his primary care physician to quit smoking for his health, he had never felt a real need to do so. The weeks following his heart attack had a profound emotional impact on him, and especially the distressing image of his scared partner, children, and grandchild by his hospital bed, had really affected him. The cardiologists and nurses reiterated the urgency of quitting smoking, and he now felt himself very receptive to the message. Determined to prevent another heart attack and spare his family from further sadness, he decided to quit smoking altogether. He enrolled in a smoking cessation program and successfully quit smoking, an accomplishment that his primary care physician had considered unlikely prior to his myocardial infarction. The patient experienced his myocardial infarction as a warning and a catalyst for a fresh start. This case serves as a typical example of what is called a "teachable moment" for lifestyle change: the main topic of this dissertation.

CHRONIC ILLNESS, PREVENTION, AND THE ROLE OF LIFESTYLE

Chronic diseases such as diabetes, cardiovascular diseases, and chronic obstructive pulmonary disease are recognized globally as the leading causes of mortality(1). In the Netherlands, for example, a considerable proportion of chronic diseases and the associated healthcare costs can be attributed to an unhealthy lifestyle(2). Behaviors such as an unhealthy diet, smoking, and a sedentary lifestyle may lead to the development of non-communicable diseases within individuals(3). Consequently, promoting healthy lifestyles among the population has become a focus of health care practices over the past decades. The urgency for this is underscored by the fact that individuals who do not smoke, maintain healthy diets, have a normal weight, engage in physical activity, and consume less alcohol, tend to have a life expectancy that is on average 12 to 14 years longer(4). Additionally, they tend to live longer in good health, free from diseases(5).

In the Netherlands, these insights have led amongst others to the establishment of the "Gezond en Actief Leven Akkoord" (GALA), i.e., an agreement between many different public parties aimed at enhancing overall population health through targeted local and regional prevention strategies (Rijksoverheid, 2023). The GALA encompasses a wide array

of population-level interventions to improve healthier lifestyle, including for example the creation of smoke-free zones. These interventions have been proven highly (cost) effective in improving overall population health(6). Furthermore, in the "Integraal Zorg Akkoord" (IZA), i.e., an agreement focusing on ensuring accessibility and affordability of future healthcare, prevention and healthy living play essential roles. Through the IZA, individual preventive measures that focus on lifestyle changes and health literacy are actively encouraged (IZA, 2023). Examples include the provision of lifestyle advice and offering opportunities to participate in lifestyle intervention. Interventions aimed at promoting healthy lifestyles, particularly combined programs that offer intensive patient support, have a high probability of being effective both in terms of health outcomes and health care cost savings(7, 8).

Complying with healthy lifestyle recommendations, however, remains a fair challenge for most people. The widespread poor (long-term) adherence to behavioral recommendations(9) is supported by the limited evidence for sustainability of behavior change in response to interventions(10-12). This is not surprising given the multitude of determinants known to affect health behaviors. In addition to individual factors such as attitude, knowledge, outcome expectancies, self-efficacy, and one's cultural and socioeconomic background (13-16), health behaviors are also greatly shaped by social and environmental factors such as social support, social norms, resource availability for (un)healthy options, such as the proximity of fast-food restaurants in a neighborhood (13, 15, 17-20). This variety of determinants, coupled with the habitual nature of most daily behaviors, presents a challenge for many individuals in initiating and maintaining healthier habits (21, 22). Evaluation of the effectiveness of lifestyle interventions yields inconsistent findings, particularly in view of the long-term adherence (12).

LIFE EVENTS AS TEACHABLE MOMENTS

Changing health behavior is not always the consequence of carefully considered planning. Instead, changes are often triggered by a specific event or experience(23). As a result of such unexpected incidents, people may experience the detrimental consequences of unhealthy behaviors and therefore the urgency of adopting healthier ones. This in turn increases the individuals' desire, willingness, and even the perceived ability to make positive changes to their lifestyle. The term "teachable moments" (24), has been forwarded to describe periods of time after specific events that suddenly increase receptiveness to lifestyle advice and motivation to change behavior (24-27). Teachable moments are mostly significant life - or health events after which individuals realize that the way they

have been living constitutes a serious threat to their health, and may even lead to an early death(25). Spontaneous behavior change triggered by teachable moments differs from the fundamental principles of the 'Stages of Change' theory, which advocates for gradual behavior change resulting from preparation and motivation building(23, 28), a perspective that has faced criticism in the past (29, 30). However, the Health Belief Model (HBM) emphasizes a significant role of cues to action in behavior change(31), which can alter individuals' appraisals of threat and outcome expectations, and in turn may cause an increased motivation to engage in behaviors that reduce the chances of becoming ill (again)(24, 25). Events that bring about teachable moments may work similarly as these cues to action. Examples of events that have been regarded as teachable moments include visits to a general practitioner(26, 32) or emergency department(33), screenings for cancer or cardiovascular disease(34-37), pregnancy, or gestational diabetes (71)(38, 39), a chronic disease diagnosis(40), a diagnosis of cancer(41-43), type 2 diabetes(44), or cardiovascular disease(45, 46), or even a chronic disease diagnosis of a partner(41, 44, 47-49).

INTERVENTIONS AROUND TEACHABLE MOMENTS

According to the so-called "Fresh Start Effect," people are better at achieving behavioral change goals and are more motivated at the beginning of something new(50). Indeed, studies on lifestyle interventions during or after potential teachable moments provide support for the promising role of such timed interventions. For instance, smoking cessation programs for pregnant women are well appreciated and effective, and lifestyle advice following cancer screening is also well-received, particularly when abnormal test results are involved(36). In addition, in a large survey study, adults with a recent chronic disease diagnosis were found to be over three times more likely to quit smoking compared to individuals without new diagnoses(51). Additional support for the concept of teachable moments is provided by West and Sohal(52), who concluded that individuals who quit smoking after an unplanned quit attempt, following an urgent health event, were more likely to remain abstinent from smoking compared to those who had planned to quit at a later date. Moreover, participation in health behavior interventions after a disease diagnosis appeared to be related to the extent to which the diagnosis was perceived as a teachable moment by the patients themselves(53). The examples provide evidence for the potential of teachable moments to help bring about lifestyle change, mostly in the case of quitting smoking.

PSYCHOSOCIAL MECHANISM OF TEACHABLE MOMENTS

As just mentioned, the meaning individuals give to critical situations, such as an acute cardiac event, determines their willingness to adopt healthier behaviors(24, 26, 32). To effectively capitalize on teachable moments in healthcare, it is useful to understand the conditions necessary for certain events to lead to increased motivation for behavior change. McBride et al.(24) developed a conceptual teachable moment framework (Figure 1) to elucidate the psychosocial mechanisms that determine whether an event becomes a teachable moments based on scientific evidence in the field of smoking cessation after a lung cancer diagnosis. The first factor of this framework that determines whether an event will be experienced as a teachable moment is an increased risk perception due to an event(24). This increased perception of risk, combined with outcome expectancies, can encourage individuals to engage in health behaviors, a proposition that is in line with many established health behavior models(31, 54, 55). The second element of the framework involves emotional or affective reactions to an event(24). When there is a strong emotional impact, which can be either negative or positive, it increases the personal focus on the event, making it seem more significant to the individual. As a result, this helps to trigger a teachable moment(24). Third, the framework suggests that a teachable moment can be elicited when an event causes a redefinition of the self-concept, i.e., beliefs about oneself, self-evaluations, and perceived role responsibilities(24, 56). Significant life events that cause changes in an individual's self-concept, identity, or social roles(56-59), e.g., someone may become more aware of their role responsibilities as a parent, grandparent, or partner, after becoming diagnosed with a chronic illness, can increase the motivation to change health behavior(60).

According to McBride's framework(24), whether an event is regarded as a teachable moment that increases someone's willingness to change lifestyle, is thus determined by the extent to which it triggers an increase in risk perception, an affective response, and a re-evaluation and change in self-concept(24). Additionally, the framework underscores the importance of sufficient motivation, lifestyle-related skills, and self-efficacy, to ensure that this willingness translates into actual behavioral change(24). This perspective aligns with existing literature on the intention-behavior gap, as illustrated by a review by Faries et al.(61), which identified factors such as intrinsic motivation and cognitive and behavioral capacity as key facilitators in turning an intention into an actual change in behavior.

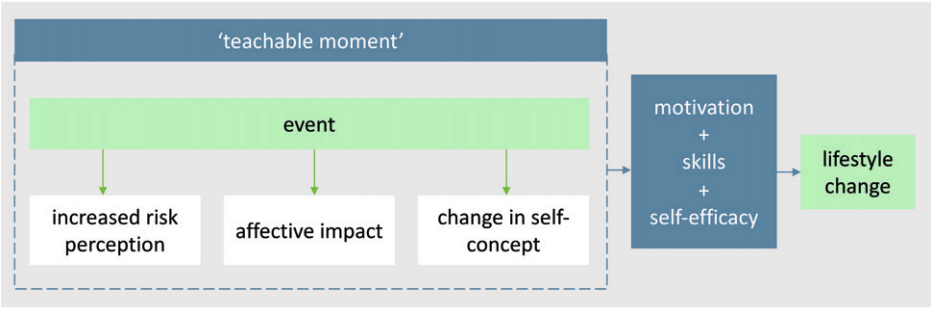

Figure 1. Conceptual teachable moment framework by McBride et al. 2003

About a dozen of studies have empirically tested the applicability of the framework in predicting lifestyle change after important life events. Empirical evidence supports the role of risk perception(38, 39, 44, 53), affect(38, 47, 62), and change in self-concept(38, 39, 44, 47, 62) in facilitating such behavioral changes. However, the majority of these studies have centered among a diagnosis of cancer(47, 53) or pregnancy(38, 39), thus it remains uncertain whether the framework may also be applicable to a broader range of events. Since there is a lack of research thoroughly examining the underlying mechanisms of life events as teachable moments, we do not know as yet how they may interplay, and/or whether other psychosocial factors might also facilitate lifestyle changes following potential teachable moments.

TOWARDS UTILIZATION OF TEACHABLE MOMENTS IN PRACTICE

Healthcare professionals have regular contact with patients around important life events that potentially evoke teachable moments, such as when patients are being newly diagnosed with a chronic disease. This offers a valuable opportunity for healthcare providers to discuss lifestyle at that moment in time when patients are potentially most receptive(25). The manner in which healthcare professionals respond to potential teachable moment situations may greatly contribute to the degree of patient motivation towards positive behavioral change(25, 26). Scholars suggest that teachable moments can be created through an optimal patient-physician interaction(26). Unfortunately, teachable moments situations in healthcare remain underutilized. For instance, a large study across 27 countries indicated –based on self-report data- that dietary advice was often not provided to cardiac patients post-hospitalization(63). Furthermore, in another study in

which the researchers analyzed patient-physician audio recordings in primary care, 30% of the consultations was categorized as missed opportunities for using the event as a teachable moment(26). Patients who had been in a successful consultation exhibited a better recall of health advice and an increased intention to modify their subsequent behavior(32). In another study that explored opportunities to offer spontaneous smoking cessation counseling in patients presented to an emergency department, even 70% of the patient-physician consultations was regarded as a missed opportunity to utilize the teachable moment(33).

Nonetheless, how lifestyle support around teachable moment situations should be offered remains unknown. For instance, it is still unsure what patients themselves require in terms of receiving lifestyle advice after important life events. To develop practices that align with the needs and preferences of patient groups, it is essential to assess their needs and preferences in this regard. Incorporating the patient perspective into the development of behavioral interventions typically leads to more individualized and cost-effective approaches(64, 65). Unfortunately, these patients' needs and preferences often receive insufficient attention; thus, to enhance the utilization of potential teachable moments in healthcare, this thesis includes research on this important aspect .

OBJECTIVE AND OUTLINE OF THIS THESIS

Several important questions on the concept of teachable moments have been understudied, including: Why some patients indeed embrace healthier behaviors after an important life event, but others do not? . When, and under which conditions do patients perceive an event as a teachable moment?(46). Therefore, the first research question of this dissertation is: Can life events serve as teachable moments that suddenly increase individuals' motivation and willingness to improve their health behaviors? Furthermore, exploring the underlying psychosocial mechanisms behind teachable moments could offer insights into why certain life events can turn into a "life changing event". Hence, the second question of this dissertation is: What is the underlying psychosocial mechanism of teachable moments? Are the prerequisites outlined by McBride et al(24) i.e., the impact that the event has on perceived risk, emotional responses, and changes in a person's self-concept, crucial factors, or do other psychosocial factors play a significant role in the mechanism of teachable moments? Lastly, considering prior research suggesting that the utilization of teachable moments in practice remain limited(26, 32), and given the absence of studies and guidelines on how to effectively provide lifestyle support around life events, the third question addressed in this dissertation is: How should potential

teachable moments be utilized, by the provision of lifestyle support around acute life events in a healthcare setting?

This dissertation focuses on cardiovascular disease events as a case study to address the research questions, as they are often suggested to be teachable moments but not yet investigated as such. Tofler et al.(45) and Coull and Pugh(46) have suggested that acute cardiac events can serve as potential teachable moments for smoking cessation and improving physical activity levels. Furthermore, studies have shown substantial lifestyle changes following acute cardiac events, such as the finding that around two third of former smokers remain smoke-free at least 8 months(66) and one year afterwards(45), an increased willingness to modify risk factors(67), a significant increase in physical activity(68), increased fruit and vegetable consumption(63, 69), and reductions in energy intake, salt, fat, and sugar after acute cardiac events(63). We consider acute cardiac events as an ideal case for this dissertation, because it has not been extensively investigated as teachable moments as yet, and because cardiovascular disease patients are the largest patient population in The Netherlands. This choice not only enables us to contribute to the broader understanding of teachable moments but also has the potential to generate practical implications for cardiovascular healthcare.

The studies conducted to answer the research questions are presented in the thesis as follows:

- In **Chapter 2**, we use a quantitative method to address research question 1 (the potential of life events as teachable moments) and research question 2 (the underlying psychosocial working mechanism of teachable moments). The chapter uses a cross-sectional design to explore whether the COVID-19 crisis induced a teachable moment that increased lifestyle change intentions among Dutch cardiovascular disease patients, and, drawing upon McBride's framework(24), investigates whether risk perception, affective impact, and self-concept are associated with increased lifestyle change intentions.
- In **Chapter 3**, we use a qualitative method to address the first two research questions. An Interpretative Phenomenological Analysis approach is adopted to explore how cardiac patients made sense of their myocardial infarction in terms of their lifestyle change (research question 1) and which processes of sensemaking are related to an intention to change lifestyle (research question 2). Hereby, Chapter 3 aims to shed light on the potential of acute life events as teachable moments and the potential psychosocial sensemaking processes that are involved during a teachable moment.

- The lack of validated scales hinders scientific research towards life events as teachable moments. **Chapter 4** therefore describes the qualitative and quantitative development and validation of scales specifically designed to learn more about the potential of life events to evoke lifestyle change intention (Cardiac Lifestyle Change Intention scale) (research question 1) and the characteristics of life events as teachable moments (Cardiac Teachable Moment scale) (research question 2).
- In addition to understanding the potential and underlying mechanisms of life events as teachable moments, it is essential to determine how they can be effectively utilized in healthcare settings to maximize the utilization of teachable moments. **Chapter 5** addresses research question 3 by investigating the perspectives of cardiac patients to explore the optimal timing and manner of delivering lifestyle advice following an acute cardiac event. The chapter employs a combination of qualitative and quantitative research methods.
- **Chapter 6** addresses the research objectives by summarizing and interpreting the findings of Chapter 2-5. The key insights of this dissertation are placed in the broader context of teachable moments in general, and it contains a reflection on how these findings have led to a better understanding of teachable moments for lifestyle. Moreover, the chapter discusses methodological considerations and provides recommendations for future research.

Combined, the chapters of this dissertation offer more insights in the potential of life events as teachable moments, the psychosocial mechanisms that underly the working mechanism of teachable moment, and the optimal utilization of these moments in healthcare. These insights can guide the development of targeted behavior change interventions or communication tools, enhancing the effectiveness of such interventions that capitalize on the potential of teachable moments(70). The findings from this research will provide recommendations for healthcare professionals regarding how to deliver tailored lifestyle advice at the appropriate moment within a healthcare setting. Whilst the chapters focus on acute cardiac events as a case, the overall aim is to obtain insights for life events as teachable moments in general.

REFERENCES

1. (IHME) IfHMaE. Findings from the Global Burden of Disease Study 2017. In: IHME, editor. Seattle, WA2018.
2. RIVM. Volkgezondheid Toekomst Verkenning 2018. Den Haag2018.
3. Furman D, Campisi J, Verdin E, Carrera-Bastos P, Targ S, Franceschi C, et al. Chronic inflammation in the etiology of disease across the life span. Nat Med. 2019;25(12):1822-32.
4. Li J, Siegrist J. Physical activity and risk of cardiovascular disease--a meta-analysis of prospective cohort studies. Int J Environ Res Public Health. 2012;9(2):391-407.
5. May AM, Struijk EA, Fransen HP, Onland-Moret NC, de Wit GA, Boer JMA, et al. The impact of a healthy lifestyle on Disability-Adjusted Life Years: a prospective cohort study. BMC Medicine. 2015;13(1):39.
6. Webb M, Fahimi S, Singh GM, Khatibzadeh S, Micha R, Powles J, et al. Cost effectiveness of a government supported policy strategy to decrease sodium intake: global analysis across 183 nations. BMJ (Clinical research ed). 2017;356:i6699.
7. Ma C, Avenell A, Bolland M, Hudson J, Stewart F, Robertson C, et al. Effects of weight loss interventions for adults who are obese on mortality, cardiovascular disease, and cancer: systematic review and meta-analysis. BMJ (Clinical research ed). 2017;359:j4849.
8. Nederland Z. De gecombineerde leefstijlinterventie nader bekeken. Diemen2018.
9. Sanz EJ. Patient adherence to medical treatment regimens: bridging the gap between behavioral science and biomedicine. BMJ (Clinical research ed). 2005;330(7500):1155.
10. Dombrowski SU, Knittle K, Avenell A, Araújo-Soares V, Sniehotta FF. Long term maintenance of weight loss with non-surgical interventions in obese adults: systematic review and meta-analyses of randomised controlled trials. BMJ (Clinical research ed). 2014;348.
11. Fjeldsoe B, Neuhaus M, Winkler E, Eakin E. Systematic review of maintenance of behavior change following physical activity and dietary interventions. Health Psychology. 2011;30(1):99.
12. Middleton KR, Anton SD, Perri MG. Long-Term Adherence to Health Behavior Change. Am J Lifestyle Med. 2013;7(6):395-404.
13. Hoedjes M, Nijman I, Hinnen C. Psychosocial Determinants of Lifestyle Change after a Cancer Diagnosis: A Systematic Review of the Literature. Cancers (Basel). 2022;14(8).
14. Strecher VJ, DeVellis BM, Becker MH, Rosenstock IM. The role of self-efficacy in achieving health behavior change. Health Educ Q. 1986;13(1):73-92.
15. Bandura A. Health promotion from the perspective of social cognitive theory. Psychol Health. 1998;13(4):623-49.
16. Ajzen I. Perceived Behavioral Control, Self-Efficacy, Locus of Control, and the Theory of Planned Behavior1. Journal of Applied Social Psychology. 2002;32(4):665-83.
17. Deslippe AL, Soanes A, Bouchaud CC, Beckenstein H, Slim M, Plourde H, et al. Barriers and facilitators to diet, physical activity and lifestyle behavior intervention adherence: a qualitative systematic review of the literature. International Journal of Behavioral Nutrition and Physical Activity. 2023;20(1):14.
18. Smagge BA, van der Velde LA, Kiefte-de Jong JC. The Food Environment Around Primary Schools in a Diverse Urban Area in the Netherlands: Linking Fast-Food Density and Proximity to Neighbourhood Disadvantage and Childhood Overweight Prevalence. Front Public Health. 2022;10:838355.
19. Booysen F, Botha F, Wouters E. Conceptual causal models of socioeconomic status, family structure, family functioning and their role in public health. BMC Public Health. 2021;21(1):191.
20. Ball K, Jeffery RW, Abbott G, McNaughton SA, Crawford D. Is healthy behavior contagious: associations of social norms with physical activity and healthy eating. Int J Behav Nutr Phys Act. 2010;7:86.
21. Chapman K, Ogden J. How do people change their diet?: an exploration into mechanisms of dietary change. J Health Psychol. 2009;14(8):1229-42.
22. Chapman K. Can people make healthy changes to their diet and maintain them in the long term? A review of the evidence. Appetite. 2010;54(3):433-41.

23. Boudreaux ED, Bock B, O'Hea E. When an event sparks behavior change: an introduction to the sentinel event method of dynamic model building and its application to emergency medicine. Academic Emergency Medicine. 2012;19(3):329-35.
24. McBride CM, Emmons KM, Lipkus IM. Understanding the potential of teachable moments: the case of smoking cessation. Health Educ Res. 2003;18(2):156-70.
25. Lawson PJ, Flocke SA. Teachable moments for health behavior change: A concept analysis. Patient Educ Couns. 2009;76(1):25-30.
26. Cohen DJ, Clark EC, Lawson PJ, Casucci BA, Flocke SA. Identifying teachable moments for health behavior counseling in primary care. Patient Educ Couns. 2011;85(2):E8-E15.
27. Bell K. Remaking the Self: Trauma, Teachable Moments, and the Biopolitics of Cancer Survivorship. Cult Med Psychiatr. 2012;36(4):584-600.
28. Prochaska JO, Velicer WF. The transtheoretical model of health behavior change. American journal of health promotion. 1997;12(1):38-48.
29. Littell JH, Girvin H. Stages of change. A critique. Behav Modif. 2002;26(2):223-73.
30. Adams J, White M. Why don't stage-based activity promotion interventions work? Health Educ Res. 2005;20(2):237-43.
31. Becker MH. The Health Belief Model and Sick Role Behavior. Health Education Monographs. 1974;2(4):409-19.
32. Flocke SA, Clark E, Antognoli E, Mason MJ, Lawson PJ, Smith S, et al. Teachable moments for health behavior change and intermediate patient outcomes. Patient Educ Couns. 2014;96(1):43-9.
33. Buchbinder M, Wilbur R, Zuskov D, McLean S, Sleath B. Teachable moments and missed opportunities for smoking cessation counseling in a hospital emergency department: a mixed-methods study of patient-provider communication. BMC Health Serv Res. 2014;14(1):1-10.
34. Milliron BJ, Bruneau M, Obeid E, Gross L, Bealin L, Smaltz C, et al. Diet assessment among men undergoing genetic counseling and genetic testing for inherited prostate cancer: Exploring a teachable moment to support diet intervention. The Prostate. 2019;79(7):778-83.
35. Meltzer LR, Unrod M, Simmons VN, Brandon KO, Piñeiro B, Palmer AM, et al. Capitalizing on a teachable moment: development of a targeted self-help smoking cessation intervention for patients receiving lung cancer screening. Lung Cancer. 2019;130:121-7.
36. Stevens C, Vrinten C, Smith SG, Waller J, Beeken RJ. Acceptability of receiving lifestyle advice at cervical, breast and bowel cancer screening. Prev Med. 2019;120:19-25.
37. Denissen SJ, van der Aalst CM, Vonder M, Oudkerk M, de Koning HJ. Impact of a cardiovascular disease risk screening result on preventive behaviour in asymptomatic participants of the ROBINSCA trial. Eur J Prev Cardiol. 2019;26(12):1313-22.
38. Atkinson L, Shaw RL, French DP. Is pregnancy a teachable moment for diet and physical activity behaviour change? An interpretative phenomenological analysis of the experiences of women during their first pregnancy. British Journal of Health Psychology. 2016;21(4):842-58.
39. Okely J, Mason C, Collier A, Dunnachie N, Swanson V. Diagnosis of gestational diabetes: a 'teachable moment'. Diabetic medicine : a journal of the British Diabetic Association. 2019;36(2):184-94.
40. Xiang X. Chronic disease diagnosis as a teachable moment for health behavior changes among middle-aged and older adults. Journal of Aging and Health. 2016;28(6):995-1015.
41. Frazelle ML, Friend PJ. Optimizing the Teachable Moment for Health Promotion for Cancer Survivors and Their Families. J Adv Pract Oncol. 2016;7(4):422-33.
42. Sosnowski R, Kamecki H, Bjurlin MA, Przewoźniak K. The diagnosis of bladder cancer: are we missing a teachable moment for smoking cessation? Translational Andrology and Urology. 2019;8(Suppl 3):S318.
43. Rabin C. Promoting Lifestyle Change Among Cancer Survivors: When Is the Teachable Moment? Am J Lifestyle Med. 2009;3(5):369-78.
44. Dimova ED, Swanson V, Evans JMM. Is diagnosis of type 2 diabetes a "teachable moment"? A qualitative study. Diabetes Research and Clinical Practice. 2020;164:108170.
45. Tofler GH, May R, Bartrop R, Kirkness A, Glinatsis H, de Burgh S. Acute Coronary Syndrome as a Teachable Moment for Smoking Cessation. J Smok Cess. 2015;10(1):5-11.

46. Coull A, Pugh G. Maintaining physical activity following myocardial infarction: a qualitative study. BMC Cardiovascular Disorders. 2021;21(1):105.
47. McBride CM, Blocklin M, Lipkus IM, Klein WMP, Brandon TH. Patient's lung cancer diagnosis as a cue for relatives' smoking cessation: evaluating the constructs of the teachable moment. Psycho-Oncol. 2017;26(1):88-95.
48. Mazanec SR, Flocke SA, Daly BJ. Health Behaviors in Family Members of Patients Completing Cancer Treatment. Oncol Nurs Forum. 2015;42(1):54-62.
49. Ezendam NP, Karlsen RV, Christensen J, Tjønneland A, van de Poll-Franse LV, von Heymann-Horan A, et al. Do people improve health behavior after their partner is diagnosed with cancer? A prospective study in the Danish diet, Cancer and Health Cohort. Acta Oncologica. 2019;58(5):700-7.
50. Dai H, Milkman KL, Riis J. The Fresh Start Effect: Temporal Landmarks Motivate Aspirational Behavior. Management Science. 2014;60(10):2563-82.
51. Keenan PS. Smoking and Weight Change After New Health Diagnoses in Older Adults. Archives of Internal Medicine. 2009;169(3):237-42.
52. West R, Sohal T. "Catastrophic" pathways to smoking cessation: findings from national survey. BMJ (Clinical research ed). 2006;332(7539):458-60.
53. McBride CM, Puleo E, Pollak KI, Clipp EC, Woolford S, Emmons KM. Understanding the role of cancer worry in creating a "teachable moment" for multiple risk factor reduction. Social Science & Medicine. 2008;66(3):790-800.
54. Bandura A. Social learning theory. Social learning theory: Prentice-Hall; 1977. p. viii, 247-viii, .
55. Fishbein M, Ajzen I. Belief, attitude, intention, and behavior: An introduction to theory and research. 1977.
56. Bergner RM, Holmes JR. Self-concepts and self-concept change: A status dynamic approach. Psychotherapy: Theory, Research, Practice, Training. 2000;37(1):36-44.
57. Asbring P. Chronic illness–a disruption in life: identity-transformation among women with chronic fatigue syndrome and fibromyalgia. Journal of advanced nursing. 2001;34(3):312-9.
58. Ellis-Hill CS, Horn S. Change in identity and self-concept: a new theoretical approach to recovery following a stroke. Clinical rehabilitation. 2000;14(3):279-87.
59. Kearney MH, O'Sullivan J. Identity shifts as turning points in health behavior change. West J Nurs Res. 2003;25(2):134-52.
60. Meijer E, Vangeli E, Gebhardt WA, van Laar C. Identity processes in smokers who want to quit smoking: A longitudinal interpretative phenomenological analysis. Health. 2020;24(5):493-517.
61. Faries MD. Why We Don't "Just Do It": Understanding the Intention-Behavior Gap in Lifestyle Medicine. Am J Lifestyle Med. 2016;10(5):322-9.
62. Brust M, Gebhardt WA, Numans ME, Kiefte-de Jong JC. The COVID-19 Crisis as a Teachable Moment for Lifestyle Change in Dutch Cardiovascular Disease Patients. Front Psychol. 2021;12:678513.
63. Marques-Vidal P, Jankowski P, De Bacquer D, Kotseva K. Dietary measures among patients with coronary heart disease in Europe. ESC EORP Euroaspire V. International journal of cardiology. 2020;302:5-14.
64. Brennan PF, Strombom I. Improving health care by understanding patient preferences: the role of computer technology. Journal of the American Medical Informatics Association. 1998;5(3):257-62.
65. Halvorsrud K, Kucharska J, Adlington K, Rüdell K, Brown Hajdukova E, Nazroo J, et al. Identifying evidence of effectiveness in the co-creation of research: a systematic review and meta-analysis of the international healthcare literature. J Public Health (Oxf). 2021;43(1):197-208.
66. Holtrop JS, Stommel M, Corser W, Holmes-Rovner M. Predictors of smoking cessation and relapse after hospitalization for acute coronary syndrome. Journal of Hospital Medicine. 2009;4(3):E3-E9.
67. Jokar F, Yousefi H, Yousefy A, Sadeghi M. Begin Again and Continue With Life: A Qualitative Study on the Experiences of Cardiac Rehabilitation Patients. J Nurs Res. 2017;25(5):344-52.
68. McKee G, Mooney M, O'Donnell S, O'Brien F, Biddle MJ, Moser DK. A cohort study examining the factors influencing changes in physical activity levels following an acute coronary syndrome event. European Journal of Cardiovascular Nursing. 2019;18(1):57-66.

69. Marques-Vidal P, Quinteiros Fidalgo AS, Schneid Schuh D, Voortman T, Guessous I, Franco OH. Lessons learned? Changes in dietary behavior after a coronary event. Clin Nutr ESPEN. 2019;29:112-8.
70. Eldredge LKB, Markham CM, Ruiter RA, Fernández ME, Kok G, Parcel GS. Planning health promotion programs: an intervention mapping approach: John Wiley & Sons; 2016.
71. Uzan LM, Brust M, Molenaar JM, Leistra E, Boor K, Kiefte-de Jong JC. A cross-sectional analysis of factors associated with the teachable moment concept and health behaviors during pregnancy. BMC Pregnancy Childbirth. 2024;24(1):147.