

Effect Analysis of Behavioral Change Strategy ^[1] Applied to Nutritional Intervention in Patients with Pancreatic Ductal Adenocarcinoma

Xiaojing Gu^{1,2}, Wei Zhou^{3*} and Juan Han⁴

¹School of Medical Technology and Nursing, Wuhan University of Light Industry, Wuhan 430023, Hubei, China

²Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430030, Hubei, China

³School of Medical Technology and Nursing, Wuhan University of Light Industry, Wuhan 430023, Hubei, China

⁴Tongji Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan 430030, Hubei, China

EMAIL: hanjuan79@163.com; 491321959@qq.com

* corresponding author

Keywords: Behavior change strategy; Pancreatic ductal adenocarcinoma; Nutrition Specialist Nurse

Abstract: To investigate the effect of nutritional nurse-led multidisciplinary team on nutritional intervention for patients with pancreatic ductal adenocarcinoma (PDCA). Methods Using the behavioral change strategy as a framework, 50 patients were subjected to individualized dietary behavior intervention for 12 weeks. Results The multidisciplinary team led by nutrition nurses used behavior change strategies to significantly improve the nutritional status of pancreatic patients. The behavior change strategies combined clinical evidence provided evidence for evidence-based interventions. Conclusion Behavior change strategies which provide a theoretical framework for nursing interventions.

Pancreatic ductal adenocarcinoma is one of the most malignant tumors. Official US data show that PDCA is expected to be the second leading cause of death by 2030 ^[2]^[3]. In China, the incidence of pancreatic cancer increased from 1.3% per year from 2000 to 2011 ^[4]. As everyone knows, the main challenge facing people with cancer is the impact of the disease on nutritional status and ultimately the quality of life. The main feature of PDCA-induced malnutrition is weight loss, and it is multifaceted, including pancreatic insufficiency caused by cancer (including exocrine: steatosis; endocrine: diabetes) [5]. Weight loss is often the main cause of concern for patients, driving them to seek medical help again. Research reports indicate that the weight loss rate of PDCA patients is as high as 70% to 75%, and almost three-quarters of the subjects lose more than 5% of their weight [6] [7]. The MST malnutrition screening tool is a simple, fast, effective, and reliable tool developed by Ferguson [8] to identify patients at risk of malnutrition. It is recommended by the American Dietetic Association and can be used for adults Screening of nutritional risks for inpatients. There are two main problems, namely, changes in body weight and changes in dietary intake. The behavior change strategy [1] is a comprehensive, consensus intervention strategy for behavior change developed by the University of London's Department of Clinical, Educational and Health Psychology Research, which is a complex and interactive strategy [9]. Before the behavior change intervention, we must fully collect all the mechanisms that affect behavior change. The mechanisms are accumulated into useful information, including replication, evidence synthesis, implementation, and formation of activity plans. Interventions must be clear to ensure their effectiveness [10] [11].

1 Method and Objects

1.1 Research Object

From January 2018 to January 2019, inpatients of biliary and pancreatic surgery in a top three hospital in Wuhan City were taken as the research object, and the convenient sampling method was used to select the research objects. Subjects included: (1) pancreatic ductal adenocarcinoma; (2) 18 years of age or older; (3) volunteered to participate in this study. Exclusion criteria: (1) non-pancreatic ductal adenocarcinoma; (2) with severe complications. The research object was calculated using the sample size of observational research, the formula is: $N = [U_{1-\alpha} / 2P_0(1-P_0)] / d$. Among them, $U_{1-\alpha} / 2 = 1.96$; P_0 is the proportion expected value of the target population, using conservative estimation method, taking $P_0 = 0.50$; d is the allowable error, $d = 0.15$. Taking into account the loss of sample size, the experimental group and sample size we included were 50 cases.

1.2 Research Methods

The research team consists of 8 members, including 2 residents, 2 nutrition specialist nurses (obtained nutritionist qualification certificate), 1 nutritionist (attending physician), 1 nurse in charge, 2 nurses, etc. Multidisciplinary team. Patients in the experimental group received a 12-week dietary intervention from admission [12] [13]. Specific method: From the day of admission, the resident determined the enrolled patients through imaging and other materials, and talked and signed the informed consent form, which was included in the department's WeChat group "Nutrition Consulting Group". Patients were measured for height, weight, BMI, and laboratory indicators to establish a "personal nutrition profile". Nutrition specialist nurses evaluated according to the MST nutrition screening tool. A score equal to or greater than 2 indicates that the patient is at risk of malnutrition [14]; the patients were trained to master the "food exchange method" [15] to calculate food energy, and at the same time in WeChat Upload daily dietary types and amounts. The nutritionist combines the scores of the MST screening scale, BMI, and physical activity to calculate the daily calories per person per week. After reasonable arrangements for the daily meal ratio and types of food, they are fed back to the nutrition nurse in the department. Oral nutrition is recommended if necessary. Supplements. Patients in the control group received routine dietary intervention during hospitalization.

1.3 Implementation Method of Behavior Change Strategy

The changes affecting the dietary habits of patients with pancreatic ductal adenocarcinoma in this study were collected by nutrition specialist nurses and residents who have rich clinical experience. Nutritionists and nutrition nurses will provide patients with personalized nutrition advice based on the patient's nutritional status and set goals. The initial assessment will be performed in the first week (t_1); the target review will be conducted in the next 2 to 12 weeks (t_2 - t_{12}).

Behavioral change Definition Example. Initial assessment (t_1)-Goal setting (behavior) Set goals based on behavioral results to be achieved Set goals for eating 5 shrimp per day.

Goal setting (outcome): Set or agree to set weight gain goals based on factual behavior. Targets defined by positive results (for example, 0.5 kg in a week).

Solve the problem: The nutrition team analyzes factors that influence behavior to ensure that patients have sufficient daily energy intake (such as poor appetite). Potential difficulties to increase facilitator strategies or help overcome obstacles and help them overcome them. Methods (e.g. eat less and eat more).

Action plan: Detailed planning of individualized daily diet plan. (Must satisfy individual daily energy, (for example, adult males, daily caloric intake up to 1800kcal. Kind of intake, reasonable cooking method) Food cooking method is cooking.

Behavioral monitoring (self): Establish a method for personnel to monitor and require patients to record in WeChat groups daily. Record their behavior as a change in behavior The total amount of food they have eaten

Part of a change strategy

Monitoring results (self): Establish a method for personnel to monitor and require patients to be weighed once a week. Record the results of their actions, and record their weight changes on a chart. As part of a behavior change strategy. To adjust food intake.

About how to perform: Inform the patients in detail about how to perform behaviors Showing the patients on how to use quantitative methods to estimate the calorie count of food (including Description of behavior 'skill training for food exchange method').

Related Poor Estimated Impact of Diet on Patients' Digestive Tract Function Residents in WeChat group explains the disease to patients and their families. Reflected prejudgment (such as diarrhea, bloating, vomiting, etc.) and knowledge about the disease, and how to follow proper dietary guidelines.

Reminder / Prompt: Introduction of environmental or social stimuli, regular phone follow-up by nutrition nurses. The purpose is to signal the occurrence of behavior. Remind patients to avoid eating braised meat, etc.

Grading goal: Set goals that are easy to implement initially, for patients with digestive disorders. Gradually increase the difficulty of the goal (but it can be achieved), give oral supplements once a week. Until the goal is completed and then take it twice a day for the next week. Physical changes: Maintain a stable body weight. Changes in digestive function Maintain the function of digestive system Take timely digestive enzymes to help digestion. Review meeting (t2-t12) Review objectives (behavior) Review behavioral goals with a nutritionist and ask patients if their daily energy intake goals have been met. Table 1 t1 represents the first week of intervention, t2-t12 represents the subsequent weeks of intervention

2. Results

2.1 Both groups of patients measured weight changes at 3, 6, and 12 months after discharge. The results showed that the number of patients with weight loss equal to or less than 5% at 3 months, 6 months, and 12 months after discharge was 3, 5, and 3 in the experimental group; weight loss was found at 12 months of follow-up. More than 5% are 5 people. Patients in the control group had 20, 15, and 25 weight loss patients at 3, 6, and 12 months of weight loss equal to or less than 5%; 22 had weight loss of more than 5%, 30 people, 19 people. The study showed that nearly three-quarters of the control group had different degrees of weight loss, and the longer the follow-up time, the more severe the weight loss, which is consistent with the results of multiple studies [6] [7] [16].

2.2 After the efforts of nutrition nurses and multi-disciplinary teams, patients' dietary standards and compliance have improved significantly. Since the beginning of the research, there has been close cooperation between various disciplines and the work has been clear. Some scholars believe that specialized nurses are in a specific specialty area and must have skilled nursing skills and knowledge [17].

2.3 In this study, a weekly systematic review and 12-week behavioral management effectively compensated for the limitations of behavioral changes caused by insufficient intervention intensity (too few dietary interventions).

3. Discussion

The vast majority of patients with PDCA will experience weight loss. There are relatively few dietary and nutritional interventions for PDCA internationally, and there are no consensus guidelines on nutritional management of PDCA. In the course of conducting research, design and evaluate theory-based interventions by linking behavior change with behavior management strategies and clinical practice. The behavior change strategy requires repeated communication between the nutrition nurse and a registered dietitian, including adjusting the type and amount of the patient's diet (small target adjustments). At the same time, the nutrition nurse should also fully understand the subjective feelings of the patient. The pros and cons of a daily recommended meal (considering the pros and cons) also play a role in changing behavior. The behavior change strategy requires multi-disciplinary teams to repeatedly review, adjust, and feedback on changes in patient

behavior, which is more suitable for small sample interventions, which is consistent with the findings of Dr. Susan Michie [1] 's team.

References

- [1] Susan Michie, DPhil, C Psychol , Michelle Richardson, PhD et al.The Behavior Change Technique Taxonomy (v1) of 93 Hierarchically Clustered Techniques: Building an International Consensus for the Reporting of Behavior Change Interventions. *ann. behav. med.*46:81–95, (2013) .
- [2] Rahib L, Smith BD, Aizenberg R, et al. Projecting cancer incidence and deaths to 2030: the unexpected burden of thyroid, liver, and pancreas Cancers in the United States. *Cancer Res*;74:2913–2921,2014.
- [3] Siegel RL, Miller KD, Jemal A. Cancer statistics, 2016. *CA Cancer J Clin.*;66:7–30,2016.
- [4] Chen W,Zheng R,Baade PD,et al.Cancer statistics in China,2015[J].*CA Cancer J Clin*,66(2):115-132,2016.
- [5] Laura Nemer MD, Somashekar G. Krishna, MD, MPH et al.Predictors of Pancreatic Cancer–Associated Weight Loss and Nutritional Interventions.*Pancreas*,46(9):1152-1157,2017.
- [6] Papadoniou N,Kosmas C,Gennatas K,et al.Prognostic factors in patients with locally advanced(unresectable)or metastatic pancreatic adenocarcinoma:a retrospective analysis.*Anticancer Res.*;28:543-549,2008.
- [7] Pausch T,Hartwig W,Hinz U,et al.Cachexia but not obesity worsens the postoperative outcome after pancreatoduodenectomy in pancreatic cancer.*Surgery.*;152(3 Suppl 1):S81-S88,2012.
- [8] Shi Hanping, Li Wei, Qi Yumei, et al. Nutrition screening and evaluation [M]. Beijing: People's Health Publishing House: 8-150, 2014.
- [9] Craig P, Dieppe P, Macintyre S, et al. Developing and evaluating complex interventions: The new Medical Research Council guidance. *BMJ.* :337,2008.
- [10]Michie S, Fixsen D, Grimshaw JM, Eccles MP. Specifying and reporting complex behavior change interventions: The need for a scientific method. *Implement Sci*;40:1-6. 2009.
- [11]Davidson KW, Goldstein M, Kaplan RM, et al. Evidence-based behavioral medicine: What is it and how do we achieve it? *Ann Behav Med.* ;26:161-171,2003.
- [12]Isenring EA, Capra S, Bauer JD. Nutrition intervention is beneficial in oncology outpatients receiving radiotherapy to the gastrointestinal or head and neck area. *Br J Cancer*;91(3):447–52. 2004.
- [13]Baldwin C, Spiro A, McGough C, Norman AR, Gillbanks A, Thomas K, Cunningham D, O'Brien M, Andreyev HJ. Simple nutritional intervention in patients with advanced cancers of the gastrointestinal tract, nonsmall cell lung cancers or mesothelioma and weight loss receiving chemotherapy: a randomised controlled trial. *J Hum Nutr Diet.*; 24(5):431–40, 2011.
- [14]IgozY, Vellas B, Garry PJ. Assessing the nutritional status of the elderly: The Mini Nutritional Assessment as part of the geriatric evaluation[J]. *Nutr Rev*, 54(1 Pt2): 59-65,1996.
- [15]Gu Jingfan, Shao Jizhi, Clinical Nutrition [M]. Shanghai: Shanghai Science and Technology Press: 437-440, 1990.
- [16]Olson SH,Xu Y,Herzog K,et al.Weight loss,diabetes,fatigue,and depression preceding pancreatic.pancreas;45:986-991.2016.
- [17]Zhang Pingping, Zhang Jiangyan. Current status of Japanese clinical nursing specialists and specialist nurses. *Chinese Journal of Nursing*, 37 (9): 716-717, 2002.