J. appl. health sci. 2019; 5(1): 87-96

Health Promotion Behaviors and Quality of Life among Cancer Patients – A Systematic Review

[1] Sanja Ledinski Fičko
[1] Martina Smrekar
[1] Ana Marija Hošnjak
[1] Biljana Kurtović
[1] Irena Kovačević
[2] Vesna Konjevoda

[1] University of Applied Health Sciences, Department of Nursing, Zagreb, Croatia
[2] Clinical hospital "Sveti Duh", Clinical Department of Surgery, Zagreb, Croatia

Abstract

Background: Multiple health behavior change interventions, especially promoting the improvements in diet and exercise behaviors, have been used to ameliorate the adverse effects of cancer and its treatment. It is a well known fact that healthy lifestyle has a significant impact on cancer cases. The group of people which are at a high risk of cancer are smokers, people with low fruit and vegetable intake, people with a drinking problem and with low physical activity. In 43% of the cases the incidence of cancer can be prevented by conducting adequate measures.

Aim: The aim of this study is an overview of health promotion behaviors such as non-smoking, non-alcohol abuse, physical activity, diet and body weight and their impact on quality of life among cancer patients and cancer survivors.

Methods: Literature overview was made systematically. Studies that have been included in the final analysis, were analyzed through 4 steps. After reviewing the abstract, 6 full text articles were examined in more detail for eligibility and were included in the final data analysis.

Results: All six articles have shown that patients with healthy lifestyle and those who are conducting health promotion behaviors have greater score on the quality of life questionnaire. Physical activity has an impact on symptoms of treatment and disease.

Conclusion: This study supports the need for future research on public health view on conducting healthy lifestyle during therapy and in the remission of disease. Health promotion behaviors have great impact on quality of life among cancer patients and cancer survivors.

Keywords: cancer patients, health promotion behaviors, quality of life, methodology

Article received: 18.01.2019.

Article accepted: 10.02.2019.

DOI: 10.24141/1/5/1/8

Corresponding author:
Sanja Ledinski Fičko
University of Applied Health Sciences
Mlinarska cesta 38, Zagreb, Croatia
Tel: + 385 91 4595 713
Fax: +385 1 5495 849
E-mail: sanja.ledinski-ficko@zvu.hr

1. Introduction

In 2015, there were 22,503 newly diagnosed cancer cases, excluding skin cancer in Croatia, with 13,704 cancer deaths. The male to female ratio was 54:46 [1]. In comparison to other European Union countries, Croatia has middle incidence but high mortality rate of cancer disease. In cancer cases which are related to smoking, Croatia has much higher incidence than the other countries in the European Union. Trends in reduction of mortality among cancer patients is also not recorded which is the case of Northern and Western Europe.

European Union countries implement programs about risk behaviors which are connected to the incidence of cancer. It is a well known fact that healthy lifestyle has a significant impact on cancer cases. The group of people which are at a high risk of cancer are smokers, people with low fruit and vegetable intake, people with a drinking problem and with low physical activity. In 43% of the cases the incidence of cancer can be prevented by conducting adequate measures.

It is estimated that worldwide there are 28 million cancer survivors within 5 years of diagnosis. During the treatment and recovery, they face many physical and emotional challenges, associated with persistent and profound adverse effects, and this has a great impact on physical and mental quality of life [2]. During therapy and even five years after diagnosis, many survivors still avoid physical activity. A Roundtable by the American College of Sports Medicine concluded that exercise is safe during and after cancer treatment and results in improvements in health-related quality of life (HRQoL) [3].

A substantial percentage of cancer survivors continue to smoke after diagnosis. This kind of behavior is caused by multiple factors, including lack of knowledge or denial about the connection between tobacco and cancer etiology, limited knowledge about the adverse effects of smoking on treatment outcomes and survival. Harmful effects of continued smoking following a cancer diagnosis and during treatment is the area of interest for researchers, and also the reason for writing numerous papers. These effects can be immediate, such as reduced treatment efficacy, increased side effects and complications, as well as delayed and prognostic, such as increased rates of recurrence and second primary tumor, poorer overall survival and decreased quality of life [4].

The Women International Nutrition Study found that a low-fat diet improved relapse-free survival by 24%, but the benefit seemed to be limited to women whose tumors were negative for estrogen and progesterone receptors. The Women International Nutrition Study intervention recommended consumption of a diet high in fruits, vegetables and fiber, and low in fat. Risk of cancer is related to dietary patterns and body consumption. Researchers are conducting studies to explore the effects of recurrence with body consumption and dietary patterns. Diet can also have an impact on survivors' quality of life, primarily through its association with weight. For some cancers, obesity is a risk for developing the disease, therefore survivors of these cancers are at an increased risk of obesity after diagnosis. Obesity in cancer survivors is related to greater fatigue and poorer physical functioning and quality of life [5-12].

Multiple unhealthy behaviors often co-occur, such as physical inactivity and poor diet. Targeting change in multiple versus single health behavior offers the potential of increased health benefits, maximized health promotion, and reduced health care costs. Multiple health behavior changes interventions, especially promoting improvements in diet and exercise behaviors, have been used to ameliorate the adverse effects of cancer and its treatment [13-21].

Long term health related quality of life can be affected in several ways among cancer patients due to anatomical changes resulting from the cancer or its treatment which may permanently impair sexual function and reproductive ability, and significantly impact self-image and social well-being [22].

The purpose of this study is to present available scientific articles regarding the impact of health promotion behaviors on quality of life. Also, the purpose of the overview of scientific articles is to warn on the importance of healthy behaviors on the success of treatment and symptoms of disease.

The aim of this study is an overview of health promotion behaviors such as non-smoking, non-alcohol abuse, physical activity, diet and body weight and their impact on quality of life among cancer patients and cancer survivors.

2. Methods

In order to study health promotion behaviors and quality of life among cancer patients, the following steps were determined:

1. The literature search was performed using the following databases: ScienceDirect, PubMed Central and Web of Science
2. Determining the impact of health targeted behavior on the quality of life among cancer patients
3. Overview of the health promotion targeted programs.

2.1. Systematic review of literature

The literature search was performed in January 2018 using the following databases: ScienceDirect, PubMed Central and Web of Science, a time span from 2005 to 2017 was selected. The following keywords were used: "health promotion", "health promotion behaviors", "quality of life" and "cancer patients". A time span from 2005 to 2017 was selected.

Studies that have been included in the final analysis, were analyzed through 4 steps. In the first step, there were selected articles that matched by the title. Keywords were entered in the search base. In the second step, an analysis of the year when the articles were published was conducted (2005-2017). In the third step, the analysis of abstracts of studies that matched by the title and year of publishing were conducted. Only full text articles were considered for further analysis in the fourth step, after applying the inclusion and exclusion criteria. We analyzed six full texts and built the table in which included information related to the study, methodology of research, characteristics of participants and main results.

2.2. Inclusion and exclusion criteria

We included the articles published in scientific journals in English, articles with full text available online, focusing on the year of publication between 2005 and 2017. Also, the analysis included articles that were relevant according to the set goals.

The studies with a date of publication before 2005 were excluded.

2.3. Determining the impact of health targeted behavior on the quality of life among cancer patients

Overview of the selected studies enabled determination of impact of healthy behaviors such as physical activity, non-smoking behavior and consumption of recommended diet on quality of life among cancer patients. Selected studies also enabled determination of factors which have influence on compliance on healthy behaviors.

2.4. Overview of health promotion targeted programs

National programs of healthy promotion behaviors were searched. The analysis of the Croatian National program for health promotion and prevention of disease was conducted. The programs have shown that education of healthy behaviors and early diagnosis with screening test is planned years ahead and are also conducted at the planned time [23].

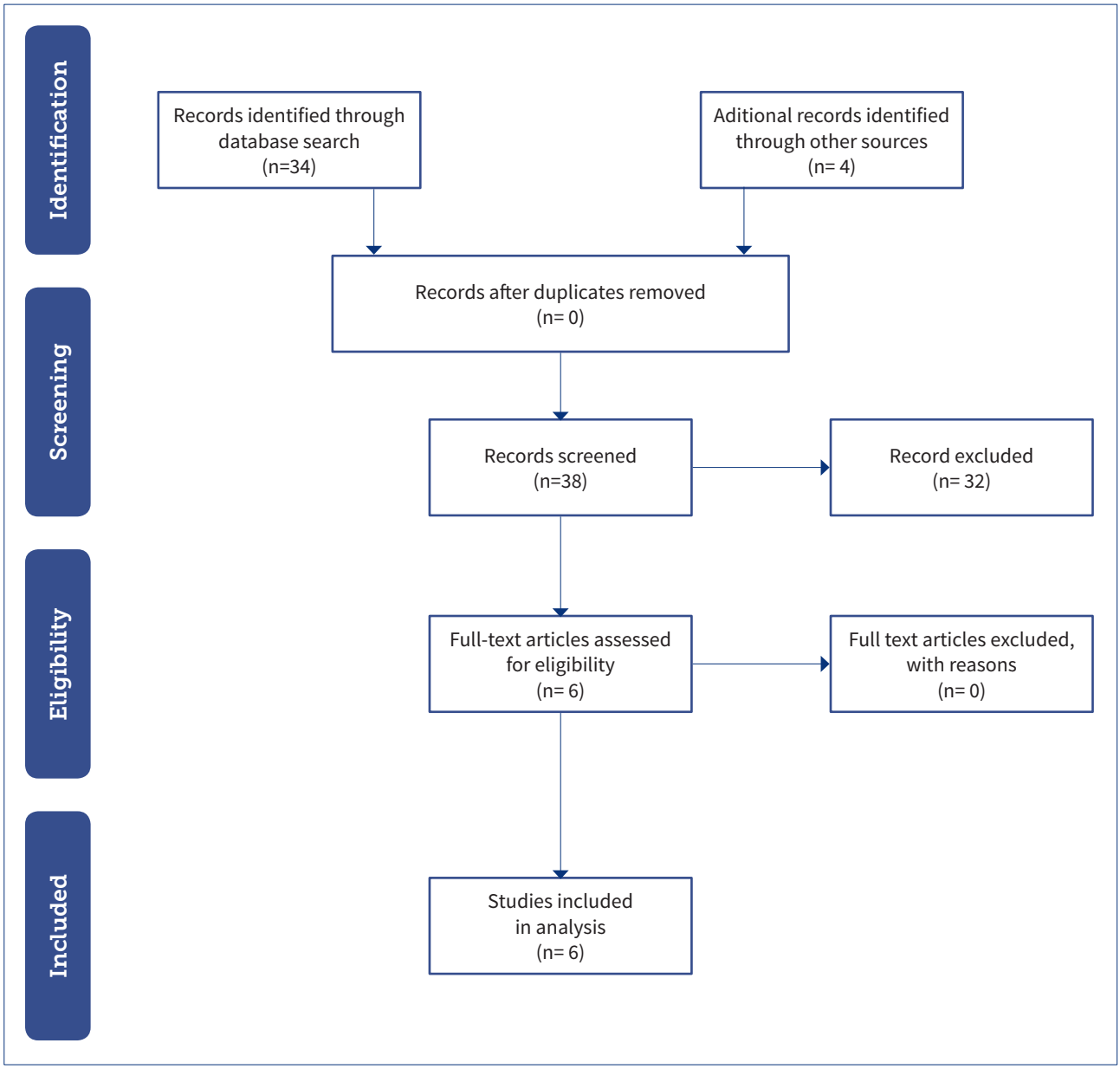
3. Results

The initial search found 38 articles. After reviewing the abstracts, six full text articles were examined in more detail for eligibility and were included in the final data analysis. The search and selection process are illustrated in Flowchart 1. The articles in the final data set included research on impact of health behaviors on quality of life among cancer patients' and cancer survivors. All six of the articles were research papers.

3.1. Synthesis of evidence

All six research papers have shown that patients with healthy lifestyle and those who are conducting health promotion behaviors have greater score on quality of life questionnaire. Physical activity has impact on symptoms of treatment and disease. Selected articles are presented and described in Table 1.

All research papers were using multiple instruments to obtain the results. Most common instruments that was used are EORTC QLQ and FACT-G questionnaires and all of them used sociodemographic questions. Most of the research was conducted in USA.



Flowchart 1. **Flowchart of the overview of the studies finally included in the systematic review**

All research papers were using descriptive statistic with t–test, x^2, Fisher' exact test and regression analyses to obtain the results. The results are illustrated in the tables.

3.2. Overview of health promotion targeted programs

The analysis of the health promotion targeted programs has shown that numerous programs are conducted in Croatia. Physical activity is promoted by posters and education in general schools. Some of the examples are posters near elevators in hospitals which encourage people to walk at least one floor, also there are posters on tram stations which encourage people to walk at least one tram station.

Promotion of non-smoking behavior is conducted through education in general schools, posters with illustrated pictures which show the effects of nicotine and small posters on packs of cigarettes.

Early screening tests are used for early diagnosis of cancer. Programs are conducted among young, adult

Table 1. **Description of the included studies**

Article	Description	Main results
Backman M. et al., 2014., A randomized pilot study with daily walking during adjuvant chemotherapy for patients with breast and colorectal cancer [24]	N-162 Instrument: Demographic information, EORTC QLQ-C30, EORTC QLQ-BR23EORTC QLQ-CR38, Six project-specific questions	In the BRCA group, breast symptoms such as swelling, mobility or pain around the operated breast significantly decreased for patients' who conducted physical exercise – walking. Research was conducted during the adjuvant chemotherapy protocol.
Blanchard CM et al., 2008., Cancer Survivors Adherence to lifestyle Behavior Recommendations and Associations with Health-Related Quality of Life: Results from American Cancer Society's SCS-II [25]	N-9,105 Instrument: Demographic and medical information, Godin Leisure-Time Exercise Questionnaire, RAND-36 Health Status Inventory	Breast, prostate and colorectal cancer survivors who met the 5-A-Day or smoking recommendation had significantly higher HRQoL compared with those who did not. Skin melanoma survivors who met the 5-A-Day recommendation reported significantly higher HRQoL compared with those who did not, however, no HRQoL differences were observed regarding the smoking recommendation.
Becker H et al., 2012. Predictors of Quality of Life for Long-Term Cancer Survivors with Preexisting Disabling Conditions [26]	N – 145 Instrument: Sociodemographic questions, Economic Adequacy Scale- EAS, Personal Resource Questionnaire- PRQ, Barriers to Health- Promoting Activities for Disabled Persons scale-, Center for Epidemiological Studies Depression Scale-10–CESD-10, Self-Rated Abilities for Health Practice scale- SRAHPS, Health-Promoting Lifestyle Profile II- HPLP-II, Functional Assessment of Cancer Therapy- General- FACT-G	None of the cancer-related variables were significant predictors of FACT-G scores. The 48% of respondents had an additional comorbid condition suggests multiple health factors impact their lives, and they may find it difficult to disentangle the effects.
Hawkes AL. et al., 2014., Effects of a Multiple Health Behavior Change Intervention for Colorectal Cancer Survivors on Psychosocial Outcomes and Quality of Life: A Randomized Controlled Trial [27]	N- 410 Instrument: Sociodemographic questions, Brief Symptom Inventory, Mindful Attention Awareness scale, Acceptance and Action Questionnaire, FACT-C	Physical activity can improve physical well-being and improvements in exercise have been shown to mediate changes in quality of life.
Perkins HY et al., 2009., Effects of Treatment Factors, Comorbidities and Health-related Quality of Life on Self-efficacy for Physical Activity in Cancer Survivors [28]	N- 280 Instrument: Demographic and comorbidity information, Medical Outcome Study Short Form- 36- SF-36, self-reported measure of health-related QoL, CESD, SE questionnaire for physical activity, 7-Day Physical Activity Recall Questionnaire- 7 DPARQ	Univariate analysis of comorbid health problems of the breast cancer survivors indicates that education level, history of arthritis, CESD score, and all eight subscales of the SF-36 demonstrated an association with SE for physical activity.
George SM et al., 2014., Objectively Measured Sedentary Time Is Related to Quality of Life among Cancer Survivors [29]	N- 54 Instrument: Moderate–vigorous Intensity physical activity- MVPA, SF-36	Survivors with higher sedentary time reported significantly poorer physical well-being, as indicated by lower scores on several physical HRQoL indices, including overall physical summary scores and subscores for physical functioning.

and elderly people. Following screening tests are implemented - mammography, Pap test, and fecal occult blood tests.

When the diagnosis of cancer disease is confirmed, patients are also educated about healthy behaviors. Healthy dietary patterns and body composition is one of the goals of education. Prohibited and desirable groceries are listed and given to patients in written form. Also, education about smoking and drinking problems is conducted with variation in outcome.

4. Discussion

The purpose of this analysis was to examine the impact of health promotion behaviors on quality of life among cancer patients and cancer survivors, and to determine willingness for compliance with desirable behaviors. The overview of scientific articles give us perspective of the benefits of listed behaviors on patients and also on outcomes of treatment and their well-being.

As the survival rates of cancer patients increase, health promotion for cancer survivors becomes a more important issue. Also, there is an increase of newly diagnosed cases of patients with different types of cancer.

The results of research listed below show a significant impact of health promotion behaviors on quality of life. The patients which participated in the studies reported significantly higher HRQoL when they complied with recommended behavior. Also, in some of the results there was disproportion which depends on the type of cancer.

Research conducted in the USA has shown that survivors with higher sedentary time reported significantly poorer physical well-being, as indicated by lower scores on several physical HRQoL indices, including overall physical summary scores (p=0.003), and subscores for physical functioning (p=0.028) and general health (p=0.004) [2].

Results indicate the importance of physical activity during the period of treatment and in remission phase. Poorer physical well-being and lower scores of HRQoL are related to higher sedentary time.

Self-reported sedentary behavior has been shown to be higher in cancer survivors than individuals without cancer, stressing the importance of this behavior as a target for health promotion efforts in this group. Current, national physical activity guidelines for adults include statements about avoiding inactivity and limiting discretionary screen, sedentary time. There are a multitude of opportunities to address this behavior, both in the clinic and home settings, and an intervention targeting the interruption of sedentary behavior in cancer survivors.

Another study has shown that there were no significant differences in HRQoL between the intervention and control group for the colorectal sample. The intervention was physical activity – walking. In the BRCA group, breast symptoms such as swelling, mobility or pain around the operated breast significantly decreased for patients in the intervention group post-intervention, while the control group results were unchanged (p=0.045). Research was conducted during the adjuvant chemotherapy protocol [24].

Results indicate disproportion regarding to type of cancer disease. While there was no significant differences in HRQoL among patient with colorectal cancer, there was significant impact on HRQoL among breast cancer patients. The results have shown a positive effect on the symptoms during the adjuvant chemotherapy protocol. Education and encouraging patients to engage in physical activity is an important nursing intervention.

Oncology nurses should be aware of the importance of providing timely, individualized instruction to patients newly diagnosed with cancer after assessing each patient's needs and preferences.

According to Guen, 2013, only 26.0% of cancer survivors met the recommended level of physical activity. These findings differ greatly from previous research, which reported that 72% of breast cancer survivors and 58% of prostate and breast cancer survivors engaged in routine exercise after treatment [7]. One of the reasons for these results is, according to the authors, that there are no guidelines for physical activity in Korea while physical activity guidelines for cancer survivors do exist in other countries. According to the authors, it is hard to use the guidelines from other countries due to the differences in demographic characteristics and cancer types. The authors state that physical activity can improve aerobic fitness, upper and lower body strength, body weight, functional quality of life, anxiety and self-esteem.

Previous studies have reported that informational needs related to treatment, health promotion, and mental health are more prevalent among young cancer

patients. It is also shown that young adult cancer patients experience more physical and psychosocial impact due to their cancer diagnosis, and therefore, may have greater practical, emotional, and interpersonal needs for information about healthy lifestyle than older patients.

A research conducted in Nova Scotia has shown that breast, prostate, and colorectal cancer survivors who met the 5-A-Day or smoking recommendation had significantly higher HRQoL compared with those who did not. No significant differences were observed for bladder or uterine cancer survivors regarding 5-A-Day or smoking in this research. Also, skin melanoma survivors who met the 5-A-Day recommendation reported significantly higher HRQoL compared with those who did not [25].

According to Blanchard, 2008, different types of cancer had different HRQoL results. The best results are shown among breast, prostate and colorectal cancer patients. Recommended behaviors were no smoking and diet 5-A-Day with great results [25].

Similar research that was conducted has shown the bivariate correlations among contextual factors, resources, barriers, and quality of life (FACT-G subscales) with the expectation of the general health and functional limitations self-ratings. The resources and barriers items, particularly depression symptoms (CESD-10) – (SD– 4), social support (PRQ) – (SD- 5), and barriers to health promotion, as well as frequency of health promotion (HPLP-II) – (SD- 6), correlated more highly with FACT-G subscales than other contextual factors such as age or cancer-related variables [26]. Patients who survived cancer but have permanent disability self-rated quality of life similar to other groups of cancer survivors except in the area of physical well-being, where they were roughly half a standard deviation below the mean of the other groups.

Becker, 2012, states that depressive symptoms, social support and frequency of health promotion correlates highly with FACT-G [26].

Research conducted in Australia aimed to describe the effects of a multiple health behavior change intervention for colorectal cancer survivors on psychosocial outcomes and cancer specific quality of life and to investigate mediators of the effects. Research showed significant improvements in distress at six and twelve months, and there were no differences between the groups. There was a significant decrease in the proportion of participants with a positive distress score from baseline (5.9%) to six (2.3%) and twelve months (3.7%); however, there were no significant differences between the treatment, groups were observed for cancer-specific quality of life (physical well-being) at six and twelve months. Both groups showed significant improvements in other quality of life subscale (except social well-being at twelve months) and the trial outcome index at six and twelve months, and there were no significant differences between the groups [27]. One of the conclusions of this research is that being physically active may increase the level of social support available to cancer survivors and may serve as an adaptive coping strategy to decrease levels of distress.

Several reviews indicate that survivors gain multiple benefits from psychosocial interventions which have a positive effect on emotional adjustment, functional adjustment, and treatment- and disease-related symptoms regarding to psychological distress. Interventions are typically delivered “face to face”, either individually or to a group [5].

Research conducted in the USA in 2009, has shown that vitality, or energy level, has been linked with a higher level of physical activity in breast cancer survivors and with perceptions of health among women 40 years and older. Research also indicated that demographic variables, health-related quality of life, and comorbid health problems among prostate cancer survivors indicate that educational level, CESD score, and seven of eight SF-36 subscales all are associated ($p \geq 0.2$) with SE for physical activity [28].

It also showed that physical activity can improve physical well-being and improvements in exercise have been shown in quality in life.

WHO defines quality of life as the individual’s perception of their position in life in the context of the culture and value system in which they live and in relation to their goals, expectations, standards and concerns [29].

Indicators of quality of life, once implemented, can provide evidence based on comparable and standardized measures of system quality that can be used to stimulate and optimize accountability and continuous improvement within the health care system. Conducting the studies using the various health related quality of life questionnaire is the basis for a set of indicators for ongoing standardized monitoring of various quality dimensions [30]. The concept of quality of life is distinct from health, though related to it. Economic, political, cultural, and spiritual factors may affect overall quality of life.

The impact of disease and treatment on the patient’s overall well-being and functioning is a topic of grow-

ing interest in clinical research and practice [30]. Using the HRQoL questionnaire has a great importance on the approach to patients suffering from different type of carcinoma, and thus influence the improvement of treatment outcomes. Health related quality of life is increasingly used as an outcome in clinical trials, effectiveness research, and research on quality of care. Factors that have facilitated this increased usage include the accumulating evidence that measures of HRQoL are valid and reliable, and outcome measures are responsive to important clinical changes. When patient describes or characterizes what they experienced as a result of medical care, they are useful and important supplements to traditional physiological or biological measures of health care [31-36].

Additional research is needed to evaluate the level of information given to cancer patients and cancer survivors about healthy behaviors from health workers - nurses and physicians. Many variations exist regarding patient preferences, experiences, and learning styles. It would give us a perspective of effective nursing interventions about education regarding healthy behaviors. Also, there is a need for research to evaluate the impact of healthy behaviors on quality of life among different types of cancer disease. According to available information there is a lack of information about the impact of healthy behavior on quality of life among hematology patients.

5. Conclusion

Health promotion behaviors have a great impact on quality of life among cancer patients and cancer survivors. Health promotion behaviors are non-smoking, non-alcohol abuse, physical activity and conducting dietary plan of eating. Their impact is obvious in the reduction of symptoms of cancer disease such as swelling and pain, and also in the reduction of symptoms of cancer treatment. All of the above have a great impact on self-reported quality of life among cancer patients and cancer survivors.

This study supports the need for future research on public health view on conducting healthy lifestyle during therapy and in the remission of disease.

6. Author's Disclosures of Potential Conflicts of Interest

The authors indicated no potential conflict of interest.

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ZDRAVE ŽIVOTNE NAVIKE I KVALITETA ŽIVOTA ONKOLOŠKIH BOLESNIKA – SISTEMATIČAN PREGLED LITERATURE

[1] Sanja Ledinski Fičko
[1] Martina Smrekar
[1] Ana Marija Hošnjak
[1] Biljana Kurtović
[1] Irena Kovačević
[2] Vesna Konjevoda

[1] Zdravstveno veleučilište Zagreb, Katedra za zdravstvenu njegu, Zagreb
[2] KB "Sveti Duh", Klinika za kirurgiju, Zagreb

Sažetak

Uvod: U svrhu poboljšanja liječenja malignih bolesti primjenjuju se različite intervencije usmjerene unaprjeđenju zdravog načina života, posebice promicanje navika zdrave prehrane i vježbanja. Dobro je poznato da zdrav način života ima utjecaj na sprječavanje pojavnosti malignih oboljenja. Pojedinci koje unose male količine voća i povrća, zloupotrebljavaju alkohol i provode smanjenu tjelesnu aktivnost imaju povećan rizik za obolijevanje od malignih bolesti. U 43 % slučajeva incidencija malignih bolesti može se smanjiti provođenjem odgovarajućih mjera.

Cilj: Cilj je pregledom literature utvrditi kako razvijene zdrave navike života kao što su tjelesna aktivnost, prehrana, adekvatna tjelesna težina te prestanak pušenja i konzumacije alkohola utječu na kvalitetu života i stopu preživljenja kod pacijenata oboljelih od malignih bolesti.

Metode: U pisanju rada primijenjen je sistematični pregled literature unutar dostupnih baza podataka. Studije koje su uključene u konačnu analizu analizirane su kroz četiri koraka. Nakon pregleda sažetka, detaljnije je ispitano šest cjelovitih tekstova te su uključeni u konačnu analizu.

Rezultati: Svih šest studija ukazuje na to da pacijenti sa zdravim načinom života te oni koji provode intervencije usmjerene promicanju zdravlja pokazuju bolje rezultate kroz upitnik o kvaliteti života. Također je dokazano kako tjelesna aktivnost pozitivno utječe na simptome liječenja i bolesti.

Zaključak: Studija podupire potrebu daljnjih javnozdravstvenih istraživanja o provedbi zdravog načina života tijekom terapije i remisije malignih bolesti. Promicanje zdravih životnih navika ima velik utjecaj na kvalitetu života pacijenata oboljelih od malignih bolesti i njihovo preživljenje.

Ključne riječi: oboljeli od malignih bolesti, zdrave životne navike, kvaliteta života, metodologija